



GANESAR COLLEGE OF ARTS AND SCIENCE

(Accredited with 'B' grade by NAAC)

MELAISIVAPURI - 622 403, PUDUKKOTTAI, TAMILNADU

Phone: 04333 - 247218, 247603



STUDENTS PROJECT



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Phone: 04333 - 247218, 247603

ACADEMIC YEAR 2021-22

கணேசர் கலை அறிவியல் கல்லூரி, மேலைச்சிவபுரி

தேர்வு மையம் எண்: 010

ஏப்ரல்-2022, எம்.ஏ திட்டக்கட்டுரைத் தலைப்புகள்

வ.எண்	மாணவர்கள் பெயர்	பதிவு எண்	கட்டுரைத் தலைப்பு	வழிகாட்டியின் பெயர்
1.	ஆ.அமுதா	P20100501	“ஆசாராக் கோவை உணர்த்தும் வாழ்வியல் சிந்தனைகள்”	முனைவர் சே.பிருந்தா
2.	அ.அன்சாரி	P20100502	“புதுமைப்பித்தன சிறுகதைகள் ஓர் ஆய்வு”	முனைவர் ம.செல்வராசு
3.	ச.சித்திரைச்செல்வி	P20100503	“செல்லாத பணம் புதினம் ஓர் ஆய்வு”	முனைவர் சி.குறிஞ்சி
4.	குண.கதிரேசன்	P20100504	“முல்லைக்கலியின் தொன்மங்கள்”	முனைவர் கதி.முருகேசன்
5.	போ.கௌசல்யா	P20100505	“சிறுபானாற்றுப்படையில் நகரங்களும் வள்ளல்களும்”	முனைவர் ம.தமிழ்ச்செல்வி
6.	அழ.மீனாள்	P20100506	“ஐங்குறுநூறு பாலைத்திணையில் அக வாழ்வியல்”	முனைவர் வே.அ.பழனியப்பன்
7.	க.முத்துலெட்சுமி	P20100507	“பெரும்பானாற்றுப்படையில் சமுதாயம்”	முனைவர் பொன்.கதிரேசன்
8.	சே.முத்துலெட்சுமி	P20100508	“நாட்டுப்புறக் கதைப்பாடல்களில் வரலாற்றுப் பதிவுகள்”	முனைவர் சி.முடியரசன்
9.	மு.சரண்யா	P20100509	“மலைபடுகடாம் ஓர் ஆய்வு”	முனைவர் ம.செல்வராசு
10.	அ.சங்கரி	P20100510	“பரிபாடலில் வையைப்பாடல்கள்”	முனைவர் பெரி.அழகம்மை
11.	அ.தேன்மொழி	P20100511	“சங்க இலக்கியத்தில் சடங்குகளும் நம்பிக்கைகளும்”	முனைவர் வே.அ.பழனியப்பன்
12.	ம.காவியா	P17100254	“குறிஞ்சிப் பாட்டில் இயற்கை வாழ்வியல்”	முனைவர் பொன்.கதிரேசன்


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நெறியாளர் சான்றதழ்

முனைவர் சி.குறிஞ்சி எம்.ஏ.,எம்.பில்.,பி.எட்.,பி.எச்.டி.
உதவிப்பேராசிரியர்,
தமிழ்த்துறை,
கணேசர் கலை அறிவியல் கல்லூரி,
மேலைச்சிவபுரி.

“செல்லாத பணம் புதினம் ஓர் ஆய்வு” என்னும் பொருளில் ச.சித்திரைச்செல்வி (பதிவு எண்:P20100503) அவர்கள் செய்துள்ள இவ்வாய்வேடு, அவர் கணேசர் கலைஅறிவியல் கல்லூரியில் முதுகலை தமிழ்த்துறை மாணவராக இருந்து ஆய்வு செய்த காலத்தில் தன்னியலாகச் செய்யப்பட்டதெனச் சான்றளிக்கிறேன்.

இடம்: மேலைச்சிவபுரி

நாள்: 03 / 06 / 22




முதல்வர்
முதல்வர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி


நெறியாளர்
முனைவர் சி.குறிஞ்சி
எம்.ஏ.,எம்.பில்.,பி.எட்.,பி.எச்.டி.,
உதவிப்பேராசிரியர், தமிழ் உயராய்வு மையம்,
கணேசர் கலை அறிவியல் கல்லூரி,
மேலைச்சிவபுரி 622 403.
புதுக்கோட்டை மாவட்டம்.

வநறியாளர் சான்றதழ்

முனைவர் மா.தமிழ்ச்செல்வி எம்.ஏ., பி.எச்.டி.

உதவிப்பேராசிரியர்,

தமிழ்த்துறை,

கணேசர் கலை அறிவியல் கல்லூரி,

மேலைச்சிவபுரி.

“சிறுபாணாற்றுப்படையில் நகரங்களும் வள்ளல்களும்” என்னும்

பொருளில் பொ.கௌசல்யா (பதிவு எண்:P20100505) அவர்கள் செய்துள்ள

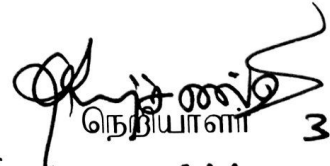
இவ்வாய்வேடு, அவர் கணேசர் கலை அறிவியல் கல்லூரியில் முதுகலை

தமிழ்த்துறை மாணவராக இருந்து ஆய்வு செய்த காலத்தில் தன்னியலாகச்

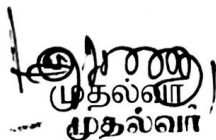
செய்யப்பட்டதெனச் சான்றளிக்கிறேன்.

இடம்: மேலைச்சிவபுரி

நாள்: 03/06/2022



நெறியாளர் 3/6/2022
முனைவர். மா.தமிழ்ச்செல்வி எம்.ஏ., பி.எச்.டி.
உதவிப் பேராசிரியர், தமிழ் உயராய்வு மையுற
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி-622403



முதல்வர்
முதல்வர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

நெறியாளர் சான்றிதழ்

முனைவர் வே. அ. பழனியப்பன் எம்.ஏ., எம்.ஃபில்., பி.எட்., பிஎச்.டி

உதவிப் பேராசிரியர் & ஆய்வு நெறியாளர்

தமிழ் உயராய்வு மையம்

கணேசர் கலை அறிவியல் கல்லூரி

மேலைச்சிவபுரி - 622403

சங்க இலக்கியத்தில் சடங்குகளும் நம்பிக்கைகளும் என்னும் தலைப்பில் பாரதிதாசன் பல்கலைக்கழக முதுகலை ஆய்வுத் திட்டப் பாடப்பகுதிக்கு அ. தேன்மொழி (பதிவு எண்: P20100511) செய்துள்ள இவ்வாய்வேடு அவர் கணேசர் கலை அறிவியல் கல்லூரித் தமிழ்த் துறையில் பயின்ற காலத்தில் தன்னியலாகச் செய்யப்பட்டது என்று சான்றளிக்கிறேன்.

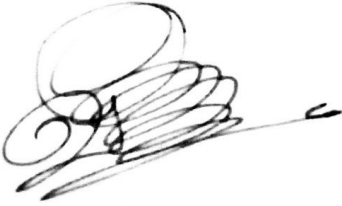
இடம்: மேலைச்சிவபுரி

நாள்: 03-06-2022


03/06/2022
நெறியாளர்

முனைவர் வே. அ. பழனியப்பன்

எம்.ஏ., பி.எட்., எம்.எஸ்சி., (யோகி) எம்.பில்., பி.எச்.டி.,
உதவிப்பேராசிரியர் & ஆய்வு நெறியாளர்
கணேசர் கலை அறிவியல் கல்லூரி,
மேலைச்சிவபுரி, புதுக்கோட்டை மாவட்டம் - 622403.
மின் அஞ்சல்: arasupalani45@gmail.com




முதல்வர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

நெறியாளர் சான்றிதழ்

முனைவர் பெரி. அழகம்மை எம்.ஏ., எம்.ஏ (யோகா), பிஎச். டி., டி.சி.ஏ.

உதவிப் பேராசிரியர்

தமிழ் உயராய்வு மையம்

கணேசர் கலை அறிவியல் கல்லூரி

மேலைச்சிவபுரி - 622403

பரிபாடலில் வையைப் பாடல்கள் என்னும் தலைப்பில் பாரதிதாசன் பல்கலைக்கழக முதுகலை ஆய்வுத் திட்டப் பாடப்பகுதிக்கு அ.சங்கரி (பதிவு எண்: P20100510) செய்துள்ள இவ்வாய்வேடு அவர் கணேசர் கலை அறிவியல் கல்லூரித் தமிழ்த் துறையில் பயின்ற காலத்தில் தன்னியலாகச் செய்யப்பட்டது என்று சான்றளிக்கிறேன்.

இடம்: மேலைச்சிவபுரி

நாள்: 03.06.2022

03/06/22
நெறியாளர்

முனைவர் பெரி. அழகம்மை எம்.ஏ., பிஎச்.டி.
உதவிப் பேராசிரியர், தமிழ் உயராய்வு மையம்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி - 622 403
புதுக்கோட்டை மாவட்டம்.



முதலவர்
முதலவர்

கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

நெறியாளர் சான்றிதழ்

முனைவர் பொன். கதிரேசன் எம். ஏ., எம். ஃபில்., டி. பிடி., பிஎச். டி.,

உதவிப் பேராசிரியர்

தமிழ் உயராய்வு மையம்

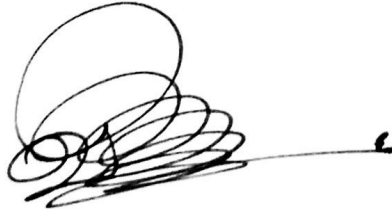
கணேசர் கலை அறிவியல் கல்லூரி

மேலைச்சிவபுரி - 622 403.

“குறிஞ்சிப்பாட்டில் இயற்கை வாழ்வியல்” என்னும் தலைப்பில் பாரதிதாசன் பல்கலைக்கழக முதுகலை ஆய்வேட்டுத் திட்டப்பாடப் பகுதிக்கு செல்வன். ம. காவினா (பதிவு எண்: P17100254) செய்துள்ள இவ்வாய்வேடு அவர் கணேசர் கலை அறிவியல் கல்லூரித் தமிழ்த் துறையில் பயின்ற காலத்தில் தன்னியலாகச் செய்யப்பட்டது என்று சான்றளிக்கிறேன்.

இடம்: மேலைச்சிவபுரி

நாள்: 03.06.2022




முதல்வர்
முதல்வர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி


நெறியாளர்
முனைவர் பொன். கதிரேசன் M.A., M.Phil., T.P.T., UGC(NET), Ph.D. Dip. Yoga
உதவிப் பேராசிரியர் & ஆய்வு நெறியாளர்,
தமிழாய்வுத்துறை, கணேசர் கலை அறிவியல் கல்லூரி,
மேலைச்சிவபுரி, புதுக்கோட்டை - 622 403.
தொலைபேசி: 9360507675.மின்னஞ்சல்: umaponkathir@gmail.com

நெறியாளர் சான்றிதழ்

முனைவர் ம.செல்வராசு., எம்.ஏ.,எம்.பில்.,பி.எட்.,பி.எச்.டி

முதல்வர்,

தமிழ் உயராய்வு மையம்,

கணேசர் கலை அறிவியல் கல்லூரி,

மேலைச்சிவபுரி-622 403.

“புதுமைப்பித்தன் சிறுகதைகள் ஓர் ஆய்வு” என்னும் தலைப்பில்

பாரதிதாசன் பல்கலைக்கழக முதுகலை ஆய்வுத் திட்டப் பாடப்பகுதிக்கு அ.அன்சாரி

(பதிவு எண்: P20100502) செய்துள்ள இவ்வாய்வேடு அவர் கணேசர் கலை அறிவியல்

கல்லூரித் தமிழ்த் துறையில் பயின்ற காலத்தில் தன்னியலாகச் செய்யப்பட்டது என்று

சான்றளிக்கிறேன்.

இடம் : மேலைச்சிவபுரி

நாள் : 3-6-2022



நெறியாளர்

கணேசர் கலை அறிவியல் கல்லூரி

மேலைச்சிவபுரி



முதல்வர்

கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

நெறியாளர் சான்றிதழ்

முனைவர் பொன். கதிரேசன் எம்.ஏ., டி.பி.டி., எம்.ஃபில்., பிஎச். டி.,

உதவிப் பேராசிரியர்

தமிழ் உயராய்வு மையம்

கணேசர் கலை அறிவியல் கல்லூரி

மேலைச்சிவபுரி - 622403

பெரும்பாணாற்றுப்படையில் சமுதாயம் என்னும் தலைப்பில் பாரதிதாசன் பல்கலைக்கழக முதுகலை ஆய்வுத் திட்டப் பாடப்பகுதிக்கு க.முத்துலெட்சுமி (பதிவு எண்: P20100507) செய்துள்ள இவ்வாய்வேடு அவர் கணேசர் கலை அறிவியல் கல்லூரித் தமிழ்த் துறையில் பயின்ற காலத்தில் தன்னியலாகச் செய்யப்பட்டது என்று சான்றளிக்கிறேன்.

இடம்: மேலைச்சிவபுரி

நாள்: 3-6-2022




நெறியாளர்

முனைவர் பொன். கதிரேசன் M.A., M.Phil., T.P.T., UGC(NET), Ph.D. Dip. Yoga.
உதவிப் பேராசிரியர் & ஆய்வு நெறியாளர்,
தமிழாய்வுத்துறை, கணேசர் கலை அறிவியல் கல்லூரி,
மேலைச்சிவபுரி, புதுக்கோட்டை - 622 403.
தொலைபேசி: 9360507675, மின்னஞ்சல்: umaponkathir@gmail.com


முதல்வர்
முதல்வர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

நெறியாளர் சான்றிதழ்

முனைவர் சி. முடியரசன் எம். ஏ., எம்.பில்., பி.எட்., பிஎச்.டி.,

உதவிப் பேராசிரியர்

தமிழ்த்துறை

கணேசர் கலை அறிவியல் கல்லூரி

மேலைச்சிவபுரி - 622 403.

நாட்டுப்புறக் கதைப்பாடல்களில் வரலாற்றுப் பதிவுகள் என்னும்

தலைப்பில் பாரதிதாசன் பல்கலைக்கழக முதுகலை ஆய்வேட்டுத் திட்டப்பாடப்

பகுதிக்கு சே.முத்துலெட்சுமி பதிவு எண்: P20100508 செய்துள்ள

,இவ்வாய்வேடு அவர் கணேசர் கலை அறிவியல் கல்லூரித் தமிழ்த் துறையில்

பயின்ற காலத்தில் தன்னியலாகச் செய்யப்பட்டது என்று சான்றளிக்கிறேன்.

இடம்: மேலைச்சிவபுரி

நாள்: 03. 06. 2022

சி. முடியரசன்
நெறியாளர்

முனைவர் சி. முடியரசன்

உதவிப் பேராசிரியர்

தமிழ் உயராய்வு மையம்

கணேசர் கலை அறிவியல் கல்லூரி

மேலைச்சிவபுரி - 622403

முத்துலட்சுமி
முதல்வர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

நெறியாளர் சான்றிதழ்

முனைவர் ம. செல்வராசு

இணைப் பேராசிரியர் மற்றும் துறைத் தலைவர்

தமிழ் உயராய்வு மையம்

கணேசர் கலை அறிவியல் கல்லூரி

மேலைச்சிவபுரி - 622403

மலைபடுகடாம் - ஓர் ஆய்வு என்னும் தலைப்பில் பாரதிதாசன் பல்கலைக்கழக முதுகலை ஆய்வுத் திட்டப் பாடப்பகுதிக்கு மு. சரண்யா (பதிவு எண்: P20100509) செய்துள்ள இவ்வாய்வேடு அவர் கணேசர் கலை அறிவியல் கல்லூரித் தமிழ்த் துறையில் பயின்ற காலத்தில் தன்னியலாகச் செய்யப்பட்டது என்று சான்றளிக்கிறேன்.

இடம்: மேலைச்சிவபுரி

நாள்: 03/06/2022



நெறியாளர்
முனைவர்.ம.செல்வராசு
எம்.ஏ., எம்.பி.ல., பி.எட்., பி.எச்.டி.,
இணைப் பேராசிரியர் & துறைத் தலைவர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

முதலவர்
முதல்வர்

கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

நெறியாளர் சான்றிதழ்

முனைவர் கதி.முருகேசன்.,
உதவிப்பேராசிரியர், தமிழ்த் துறை,
தமிழ் உயராய்வு மையம்,
கணேசர் கலை அறிவியல் கல்லூரி,
மேலைச்சிவபுரி-622 403.

“முல்லைக்கலியில் தொன்மங்கள்” என்னும் பொருளில் கண.கதிரேசன்
(பதிவெண்: P20100504) அவர்கள் செய்துள்ள இவ்வாய்வேடு, அவர் கணேசர் கலை
அறிவியல் கல்லூரியில் முதுகலைத் தமிழ்த்துறை மாணவராக இருந்து ஆய்வு செய்த
காலத்தில் தன்னியலாகச் செய்யப்பட்டதெனச் சான்றளிக்கிறேன்.

இடம் : மேலைச்சிவபுரி
நாள் : 06/06/2022

நெறியாளர்

முனைவர்.கதி.முருகேசன்
உதவிப்பேராசிரியர், தமிழ் உயராய்வுமையம்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி - 622403

முதல்வர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

நெறியாளர் சான்றிதழ்

முனைவர் சே. பிருந்தா எம். ஏ., பிஎச். டி

உதவிப் பேராசிரியர்

தமிழ் உயராய்வு மையம்

கணேசர் கலை அறிவியல் கல்லூரி

மேலைச்சிவபுரி - 622403

ஆசாரக்கோவை உணர்த்தும் வாழ்வியல் சிந்தனைகள் என்னும் தலைப்பில் பாரதிதாசன் பல்கலைக்கழக முதுகலை ஆய்வுத் திட்டப் பாடப்பகுதிக்கு ஆ. அமுதா (பதிவு எண்: P20100501) செய்துள்ள இவ்வாய்வேடு அவர் கணேசர் கலை அறிவியல் கல்லூரித் தமிழ்த் துறையில் பயின்ற காலத்தில் தன்னியலாகச் செய்யப்பட்டது என்று சான்றளிக்கிறேன்.

இடம்: மேலைச்சிவபுரி

நாள்: 03/6/2022



சே. பிருந்தா
நெறியாளர் 3/6/22
முனைவர் சே. பிருந்தா, எம். ஏ., பிஎச். டி.
உதவிப் பேராசிரியர், தமிழ் உயராய்வு மையம்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி - 622403

முதல்வா
முதல்வர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

நெறியாளர் சான்றிதழ்

முனைவர் வே. அ. பழனியப்பன் எம்.ஏ., எம்.ஃபில்., பி.எட்., பிஎச்.டி.

உதவிப் பேராசிரியர் & ஆய்வு நெறியாளர்

தமிழ் உயராய்வு மையம்

கணேசர் கலை அறிவியல் கல்லூரி

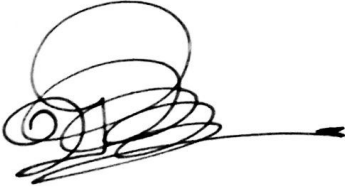
மேலைச்சிவபுரி - 622403

ஐங்குறுநூறு - பாலைத்திணையில் அக வாழ்வியல் என்னும் தலைப்பில் பாரதிதாசன் பல்கலைக்கழக முதுகலை ஆய்வுத் திட்டப் பாடப்பகுதிக்கு அழ. மீனாள் (பதிவு எண்: P20100506) செய்துள்ள இவ்வாய்வேடு அவர் கணேசர் கலை அறிவியல் கல்லூரித் தமிழ்த் துறையில் பயின்ற காலத்தில் தன்னியலாகச் செய்யப்பட்டது என்று சான்றளிக்கிறேன்.

இடம்: மேலைச்சிவபுரி

நாள்: 03/06/22


03/06/2022
நெறியாளர்



முனைவர் வே. அ. பழனியப்பன்

எம். ஏ., பி. எட்., எம். எஸ். சி., (யோகர்) எம். பில்., பி. எச். டி.,
உதவிப்பேராசிரியர் & ஆய்வு நெறியாளர்
கணேசர் கலை அறிவியல் கல்லூரி,
மேலைச்சிவபுரி, புத்தகோட்டை மாவட்டம் - 622403
மின அஞ்சல்: arasupalani45@gmail.com


முதல்வர்
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கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

கணேசர் கலை அறிவியல் கல்லூரி, மேலைச்சிவபுரி

தேர்வு மையம் எண்: 010

2021-2022 எம்.பில் திட்டக்கட்டுரைத் தலைப்புகள்

வ.எண்	மாணவர்கள் பெயர்	பதிவு எண்	கட்டுரைத் தலைப்பு	நெறியாளர் பெயர்
1.	சுப.சந்திரசேகர்	2K21FT-23043	இக்கால இலக்கியம்	முனைவர்.ம.செல்வராசு
2.	ரா.ரம்யா	2K21FT-23044	புறநானூற்றில் பொதுவியல் திணை துறைகள் ஓர் ஆய்வு	முனைவர் வே.அ.பழனியப்பன்


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MELASIVAPURI - 622 403

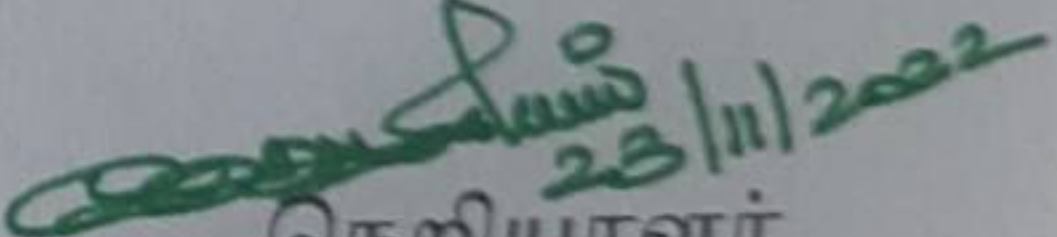
நெறியாளர் சான்றிதழ்

முனைவர் வே. அ. பழனியப்பன் எம். ஏ., எம். ஃபில்., பி. எட்., பிஎச். டி.,
உதவிப் பேராசிரியர் & துறைத் தலைவர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி - 622 403.

"புறநானூற்றில் பொதுவியல் திணை துறைகள் - ஓர் ஆய்வு"
என்னும் தலைப்பில் மேலைச்சிவபுரி கணேசர் கலை அறிவியல்
கல்லூரித் தமிழ் உயராய்வு மைய ஆய்வாளர் ரா. ரம்யா (பதிவு எண்:
2K21FT - 23044) அவர்கள் செய்துள்ள இளமுனைவர் பட்ட ஆய்வேடு
என் நெறியாள்கையின் கீழ், அவர் ஆய்வு செய்த காலத்தில்
தன்னியலாகச் செய்யப்பட்டதென்றும், இவ்வாய்வேடு மீது வேறெந்தப்
பட்டமும் ஆய்வாளருக்கு அளிக்கப்படவில்லை என்றும்
சான்றளிக்கிறேன்.

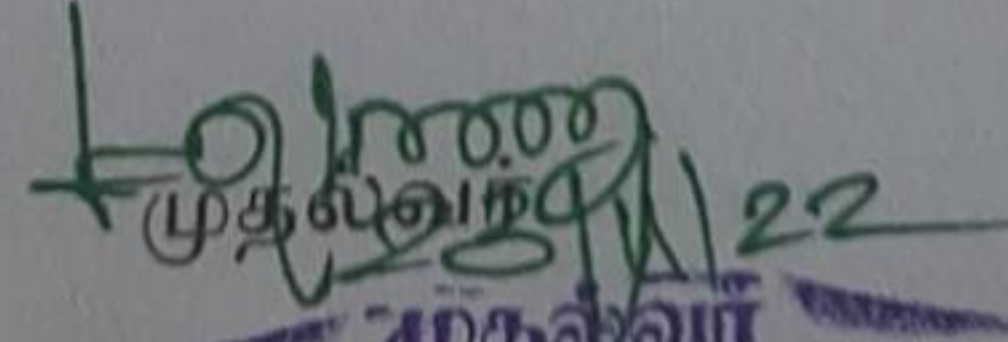
இடம்: மேலைச்சிவபுரி

நாள்: 23.11.2022


23/11/2022
நெறியாளர்

முனைவர் வே.அ.பழனியப்பன்
எம்.ஏ., பி.எட்., எம்.எஸ்.சி.(யோகா) எம்.பில்., பிஎச்.டி.,
உதவிப்பேராசிரியர் & ஆய்வு நெறியாளர்
கணேசர் கலை அறிவியல் கல்லூரி,
மேலைச்சிவபுரி, புதுக்கோட்டை மாவட்டம் - 622403.
மின் அஞ்சல்: arasupalani45@gmail.com




முதல்வர்
கணேசர் கலை அறிவியல் கல்லூரி
மேலைச்சிவபுரி

**Ganesar College of Arts and Science, PG Dept of Commerce
Project Details from 2021 -22**

S.NO	NAME	TITLE[2021-2022]	GUIDE	REG.NO
1	RAMUTHALINGAM	A STUDY ON WORKERS JOB SATISFACTIONS IN ABISHEK PLASTICS KAPPALUR	M.MOHAMED IBRAHIM MOOSA	P20110501
2	S.SATHILAKSHMI	A STUDY ON EMPLOYEES STRESS LEVEL WITH SPECIAL REFERENCE TO VNR CONSTRUCTION PROMOTERS IN PONNAMARAVATHY	V.JANCY RANI	P20110502
3	K.AZHAGUSAMI	A STUDY ON JOB SATISFACTION OF EMPLOYEES IN TVS PUDUKKOTTAI DISTRICT	M.MOHAMED IBRAHIM MOOSA	P20110503
4	S.DEEPA	A STUDY ON SIVAGANGAI DISTRICT CENTRAL CO-OPERATIVE BANK LIMITED WITH SPECIAL REFERENCE TO NERKUPPAI BRANCH	S.MANJULA	P20110505
5	M.DIVYA	A STUDY ON EMPLOYEES JOB SATISFACTION OF INDIAN OVERSEAS BANK AT PONNAMARAVATHY TALUK	A.DURAI PANDI	P20110506
6	M.MOHAMED IBRAHIM	A STUDY ON CUSTOMER AWARENESS ABOUT ONLINE MARKETING WITH SPECIAL REFERENCE TO COLLEGE STUDENTS	V.JANCY RANI	P20110507
7	N.MUTHUKUMAR	A STUDY ON BENEFICIARIES SATISFACTION OF EDUCATIONAL LOAN IN SIVAGANGAI DISTRICT [A STUDY WITH SPECIAL REFERENCE TO STATE BANK OF INDIA	C.BALAMURUGAN	P20110508
8	M.NAGAJOTHI	A STUDY ON CUSTOMER ATTITUDE TOWARDS THE MARKETING PATTERN OF AROKYA MILK IN SINGAMPINARI TALUK	A.DURAI PANDI	P20110509
9	S.PRIYANGA	A STUDY ON THE EFFECTIVENESS OF CURRENT PERFORMANCE APPRAISAL SYSTEM FOLLOWED IN BHARAT HEAVY ELECTRICALS LTD [BHEL] THIRUCHIRAPALLI	C.BALAMURUGAN	P20110510
10	C.RAJESHWARI	A STUDY ON CUSTOMER SATISFACTION OF MODERN BANKING WITH SPECIAL REFERENCE TO PONNAMARAVATHY TALUK	A.DURAI PANDI	P20110511
11	T.RANJITHA	A STUDY ON CUSTOMER ATTITUDE AND BEHAVIOUR TOWARDS CADBURYS CHOCOLATE IN PUDUKKOTTAI TOWN	S.MANJULA	P20110512
12	C.SIVAKAMI	ROLE OF AUDIT COMMITTEE IN CORPORATE GOVERNANCE -A STUDY WITH REFERENCE TO COMPANIES IN SIVAGANGAI DISTRICT	M.MOHAMED IBRAHIM MOOSA	P20110513
13	S.SIVASAKTHI	CUSTOMER SATISFACTION TOWARDS ZOMATO A STUDY WITH SPECIAL REFERENCE TO COLLEGE STUDENTS OF MADHURAI CITY	S.GOWTHAM	P20110514
14	A.SOBIYA	CUSTOMER PERCEPTION TOWARDS MOBILE BANKING APPLICATIONS A STUDY WITH SPECIAL REFERENCE TO PONNAMARAVATHY TOWN	S.GOWTHAM	P20110515

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A STUDY ON WORKERS JOB SATISFACTION IN ABHISHEK PLASTICS, KAPPALUR

A Project work Submitted to
Bharathidasan University, Thiruchirappalli
in partial fulfilment of the requirement for the Award of the Degree

MASTER OF COMMERCE

(2021 – 2022)

Submitted by

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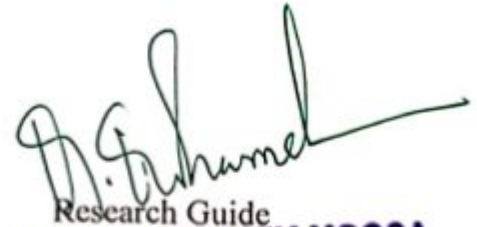
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**A STUDY ON EMPLOYEES STRESS LEVEL WITH SPECIAL
REFERENCE TO VNR CONSTRUCTION PROMOTERS IN
PONNAMARAVATHY**

*A Project work Submitted to
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(2021 –2022)

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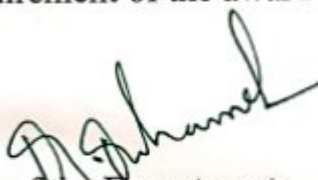


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**A STUDY ON THE JOB SATISFACTION OF EMPLOYEES IN
TVS, PUDUKKOTAI DISTRICT**

*A Project work Submitted to
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**A STUDY ON CUSTOMER AWARENESS ABOUT ONLINE
MARKETING WITH SPECIAL REFERENCE OF COLLEGE
STUDENTS**

A Project work Submitted to
Bharathidasan University, Thiruchirappalli
in partial fulfilment of the requirement for the Award of the Degree

MASTER OF COMMERCE

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**A STUDY ON BENEFICIARIES SATISFACTION OF
EDUCATIONAL LOAN IN SIVAGANGA DISTRICT**

(A Study with Special Reference to State Bank of India)

*A Project work Submitted to
Bharathidasan University, Thiruchirappalli
in partial fulfilment of the requirement for the Award of the Degree*

MASTER OF COMMERCE

(2021 – 2022)

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This is to certify that the Project work titled "A STUDY ON BENEFICIARIES SATISFACTION OF EDUCATIONAL LOAN IN SIVAGANGA DISTRICT" is the bonafide record of research work carried out by N.MUTHUKUMAR (Reg. No. P 20110508) under the guidance and supervision of Mr. C.BALAMURUGAN, M.Com.,M.Phil.,B.Ed.,SET.,Ph.D., Assistant Professor, Department of Commerce, Ganesar College of Arts and Science, Melaisivapuri, and submitted to the Bharathidasan University, Tiruchirappalli, for the partial fulfilment of requirement of the award of degree of MASTER OF COMMERCE.

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**“A STUDY ON CUSTOMER ATTITUDE TOWARDS THE MARKETING
PATTERN OF AROKYA MILK IN SINGAMPUNARI TALUK”**

**Project Report Submitted to Bharathidasan University in Partial Fulfillment of the
Requirement for the Degree of**

Master of Commerce

2021 – 2022

Researcher

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This is to certify that the project report entitled entitled “A STUDY ON CUSTOMER ATTITUDE TOWARDS THE MARKETING PATTERN OF AROKYA MILK IN SINGAMPUNARI TALUK” by M.NAGAJOTHI (Reg.No : P 20110509) is a work under my guidance and supervision during the academic year 2021- 2022.

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Signature of the Guide

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**A STUDY ON THE EFFECTIVENESS OF CURRENT PERFORMANCE
APPRAISAL SYSTEM FOLLOWED IN BHARAT HEAVY
ELECTRICALS LTD (BHEL), TIRUCHIRAPPALLI**

*A Project work Submitted to
Bharathidasan University, Thiruchirappalli
in partial fulfilment of the requirement for the Award of the Degree*

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(2021 – 2022)

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This is to certify that the Project work titled "A STUDY ON THE EFFECTIVENESS OF CURRENT PERFORMANCE APPRAISAL SYSTEM FOLLOWED IN BHARAT HEAVY ELECTRICALS LTD.(BHEL), TIRUCHIRAPPALLI" is the bonafide record of research work carried out by S.PRIYANGA (Reg. No. P 20110510) under the guidance and supervision of Mr.C.BALAMURUGAN, M.Com.,M.Phil.,B.Ed.,SET.,Ph.D., Assistant Professor, Department of Commerce, Ganesar College of Arts and Science, Melaisivapuri, and submitted to the Bharathidasan University, Tiruchirappalli, for the partial fulfilment of requirement of the award of degree of MASTER OF COMMERCE.


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**“A STUDY ON CUSTOMER SATISFACTION OF MODERN BANKING
WITH SPECIAL REFERENCE TO PONNAMARAVATHY TALUK”**

**Project Report Submitted to Bharathidasan University in Partial Fulfillment of the
Requirement for the Degree of**

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Researcher

C.RAJESHWARI

Reg . No : P 20110511

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This is to certify that the project report entitled entitled “A STUDY ON CUSTOMER SATISFACTION OF MODERN BANKING WITH SPECIAL REFERENCE TO PONNAMARAVATHY TALUK” by C.RAJESHWARI (Reg.No : P 20110511) is a work under my guidance and supervision during the academic year 2021- 2022.

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**A STUDY ON CUSTOMERS ATTITUDE AND BEHAVIOUR
TOWARDS CADBURYS CHOCOLATE IN PUDUKKOTTAI TOWN**

A Project work Submitted to
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**ROLE OF AUDIT COMMITTEE IN CORPORATE GOVERNANCE –
A STUDY WITH REFERENCE TO COMPANIES IN
SIVAGANGAI DISTRICT**

A Project work Submitted to
Bharathidasan University, Thiruchirappalli
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MASTER OF COMMERCE

(2021 – 2022)

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**“CUSTOMER SATISFACTION TOWARDS ZOMATO
A STUDY WITH SPECIAL REFERENCE TO COLLEGE
STUDENTS OF MADURAI CITY”**

*A Project work Submitted to
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This is to certify that the Project work titled “CUSTOMER SATISFACTION TOWARDS ZOMATO A STUDY WITH SPECIAL REFERENCE TO COLLEGE STUDENTS OF MADURAI CITY” is the bonafide record of research work carried out by SIVASAKTHI . S (Reg. No. P 20110514) under the guidance and supervision of **Prof.S.GOWTHAM, M.Com., M.Phil.,** Assistant Professor, Department of Commerce, Ganesar College of Arts and Science, Melaisivapuri, and submitted to the Bharathidasan University, Tiruchirappalli, for the partial fulfilment of requirement of the award of degree of **MASTER OF COMMERCE.**


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**CUSTOMER PERCEPTION TOWARDS MOBILE BANKING APPLICATIONS
A STUDY WITH SPECIAL REFERENCES TO PONNAMARAVATHI TOWN**

*A Project work Submitted to
Bharathidasan University, Thiruchirappalli
in partial fulfilment of the requirement for the Award of the Degree*

MASTER OF COMMERCE

(2021 – 2022)

Submitted by

SOBIYA . A
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DEPARTMENT OF COMMERCE
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**A STUDY ON THE EFFECTIVENESS OF CURRENT PERFORMANCE
APPRAISAL SYSTEM FOLLOWED IN BHARAT HEAVY
ELECTRICALS LTD (BHEL), TIRUCHIRAPPALLI**

*A Project work Submitted to
Bharathidasan University, Thiruchirappalli
in partial fulfilment of the requirement for the Award of the Degree*

MASTER OF COMMERCE

(2021 - 2022)

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This is to certify that the Project work titled "A STUDY ON THE EFFECTIVENESS OF CURRENT PERFORMANCE APPRAISAL SYSTEM FOLLOWED IN BHARAT HEAVY ELECTRICALS LTD.(BHEL), TIRUCHIRAPPALLI" is the bonafide record of research work carried out by S.PRIYANGA (Reg. No. P 20110510) under the guidance and supervision of Mr.C.BALAMURUGAN, M.Com.,M.Phil.,B.Ed.,SET.,Ph.D., Assistant Professor, Department of Commerce, Ganesar College of Arts and Science, Melaisivapuri, and submitted to the Bharathidasan University, Tiruchirappalli, for the partial fulfilment of requirement of the award of degree of MASTER OF COMMERCE.

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DECLARATION

I, hereby declare that the project Report titled **A STUDY ON THE EFFECTIVENESS OF CURRENT PERFORMANCE APPRAISAL SYSTEM FOLLOWED IN BHARAT HEAVY ELECTRICALS LTD (BHEL), TIRUCHIRAPPALLI** submitted to the **Bharathidasan University, Tiruchirappalli**, in partial fulfilment of the requirements for the award of the Degree of Master of Commerce is a record of original research work done by me during the period 2021-2022 under the supervision and guidance of **Mr.C.BALAMURUGAN, M.Com.,M.Phil.,B.Ed.,SET.,Ph.D.**, Assistant Professor, Department of Commerce, Ganesar College of Arts and Science, Melaisivapuri, and that it has not formed the basis for the award of any Degree/ Diploma/ Associateship/ Fellowship or other similar title to any candidate of any university.

Place: Melaisivapuri

Date:



Signature of the Candidate

(S.PRIYANGA)

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S.PRIYANGA

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CHAPTER – I

INTRODUCTION TO THE STUDY

Human Resource Management is relatively new and developed as a part of management. In simple sense, Human Resource Management means employing people, developing their resources ,utilizing, maintaining and compensation their services in tune with the job and organizational requirements with a view to contribute to the goals of the organization , individual and the society.

In this process, the performance Appraisal plays a major part in ensuring organizational effectiveness through correcting employees for the desired standard and improved performance, and suggesting the change in employee's behavior.

Recent developments in Human Resource Management indicate that performance appraisal is the basis for employee development. Performance appraisal indicates the level of desired performance level, level of actual performance and the gap between these two. This gap should be bridged through human resource development technique like training, executive development etc.

Performance appraisal is a method of evaluating the behaviors of employees in the work spot normally including both the quantitative aspects and the qualitative aspects of job performance.

NEED AND SIGNIFICANCE

This study is carried out to analyze the current performance appraisal system followed in Bharat Heavy Electricals Limited [BHEL] which mainly motivates the employees in the organization. And also the satisfaction level towards the effectiveness of the current performance appraisal is studied so as to make the changes according to the satisfaction level of the employees.

SCOPE

This study has a wide scope by analyzing the performance appraisal system, the company can standardize the system. So that the appraisal process is effective and certain crisis can be analyzed and corrected.

OBJECTIVES

The following are the objectives of the present study.

1. To study the current performance appraisal system of the organization.
2. To get the views of the raters towards the present performance appraisal system of the organization.
3. To examine the views of the ratees regarding the present performance appraisal system of the organization.
4. To offer suggestions for the effective performance appraisal system to the organization.

RESEARCH METHODOLOGY

Research comprises of defining and re-defining the problems, collecting, organizing and evaluating data, making deductions, testing hypothesis, formulating suggestive solutions and reaching conclusions.

RESEARCH DESIGN

The research is descriptive in nature. Descriptive research includes surveys and finding enquiries of different kinds. Descriptive studies are those used to describe phenomena associated with a subject population.

NATURE OF DATA USED

In the present study both primary and secondary data have been used. The primary data through interview schedules and secondary data from the official records and manuals of the organization.

TOOLS USED

The primary data were generated through interview schedule. Two separate interview schedules were prepared for appraisers and appraisee in order to collect the necessary information.

Both open-ended and close-ended questions are used in the interview schedules. Simple category scale was used as a scaling technique. In simple category scale, respondents were given dichotomous response. They were asked for statements that had only two responses that is 'yes' or 'no'.

POPULATION SIZE:

Among the population of 50,000 employees a sample of 100 employees were selected for the study.

SAMPLING TECHNIQUE:

Simple random sampling was used in the study.

Simple random sampling or probability sampling means each item in the population has an equal chance of inclusion on the sample and each one of the possible samples, in each case of finite universe, has the same probability of being selected. This study comprises Simple Random Sampling.

LIMITATIONS OF THE STUDY:

The following were the main problems faced while the study was conducted:

- Employees who were busy could not respond properly, thus by creating inconvenience in collecting extra information.
- The employees are sparsely located it took lots of time to interview an employee and switching over to the other.
- Time constraint was a major problem to complete the work.

CHAPTER SCHEME

Chapter I introduces the study and the research methodology used.

Chapter II gives the conceptual background to the study and Review of Literature.

Chapter III reveals the company profile and organization chart.

Chapter IV deals with analysis of data and interpretation.

Chapter V consists of findings, suggestions and conclusion.

CHAPTER –II

CONCEPTUAL BACKGROUND

MEANING

Performance appraisal is the systematic description of an employee's job relevant strengths and weaknesses in the work-spot, normally including both the quantitative and qualitative aspects of performance. It is a continuous process in every large scale organization.

GENERAL OVERVIEW OF PERFORMANCE APPRAISAL

Performance appraisal allows management to specify what employee must do, combines feedback and goal setting. It is always better to set SMART goals i.e. the goals must be specific, measurable, attainable, relevant and timely which enables the employee and the management to realize the level of employee's performance compared to the standard /predetermined level.

- Everyone involved need to recognize that performance appraisal involve human judgement and information processing.
- The system must be easy to operate, easy to explain, easy to maintain, easy to administer.
- The system must be job related, relevant, reliable, acceptable, practical, fair and useful.
- Ratee should participate in the development of management.
- Need to take legal issues into account.

FEATURES OF PERFORMANCE APPRAISAL

- It should match organizational objectives to individual aspirations.
- The system should be framed in such a way that it makes clear growth paths for especially talented individuals.
- The system must create a culture of excellence that inspires every employee.

- Every employee must participate in the development.
- There must be a free flow of information in the system.
- The system must equip people with the skills necessary to perform their duties.
- The system should empower the employees to take decisions without fear and hesitation.
- The system should enable in strong team building.

NEED FOR PERFORMANCE APPRAISAL

- Provide feedback information about the level of achievement and behaviour of the subordinate.
- Provide information which helps to counsel the subordinate.
- To prevent grievances and in disciplinary activities.
- Provide information about the performance ranks.
- Provide information to diagnose deficiency in the employee regarding skill, knowledge determine training and developmental needs and to prescribe the means for employee growth provides information for correcting placement.

PURPOSE OF PERFORMANCE APPRAISAL

- To guide the job changes with the help of continuous ranking.
- To create and maintain a satisfactory level of performance.
- To help the superiors to have a proper understanding about their subordinates.
- To facilitate fair and equitable compensation based on the performance.
- To contribute to the employee growth and development through training, self and management development programmer.

USES OF PERFORMANCE APPRAISAL

- To meet external challenge.
- Provides equal employment opportunity.
- Improved performance.
- Identifies training and development.
- Helps in career planning and development.

METHODS OF PERFORMANCE APPRAISAL

With the development of the appraisal system, a number of methods or techniques of performance appraisal have been developed.

TRADITIONAL METHODS

Graphics Rating Scales:

Graphic rating scales compare individual performance to an absolute standard. In this method, judgements about performance are recorded on a scale. This method is also known as linear rating scale or simple rating scale. The appraisers are supplied with printed forms, one for each employee. These forms contain a number of objectives, behaviour and trait-based qualities and characters to be rated like quality and volume of work, job knowledge, dependability, initiative attitude etc. in the case of workers and analytical ability creative ability, initiative, leadership qualities, emotional stability in case of managerial personnel. These forms contain rating of scales. Rating scales are of two types via. Continuous rating scales and discontinuous rating scales.

Ranking Method:

Under this method, the employees are ranked from best to worst on some characteristics. The rater first finds the employee with the highest performance and the employees with the lowest performance in that particular job category and rates the former as the best and the later as the poorest. Then

the rater selects the next highest and next lowest and so on until he rates all the employees in that group.

Ranking can be relatively easy and inexpensive, but its reliability and validity may be open to doubt.

Paired Comparison Method:

This method is relatively simple. Under this method, the appraiser ranks the employees by comparing one employee with all other employee in a group, one at a time.

Forced Distribution Method:

The rater may rate his employees at the higher or lower end of the scale under the earlier methods. Forced distribution method is developed to prevent the raters from rating too high or too low. Under this method, the rater after assigning the points to the performance of each employee has to distribute his ratings in a pattern to conform to normal frequency distribution.

Checklist Methods:

The checklist is a simple rating technique in which the supervisor is given with a list of statements or words and asked to check statements representing the characteristics and performance of each employee. There are three types of checklist methods, via simple checklist method, weighted checklist method and force choice method.

Essay or Free Form Appraisal:

This method requires the manager to write a short essay describing each employee's performance during the rating period. This format emphasizes evaluation of overall performance based on strength/weakness of employee performance rather than specific job dimensions.

Group Appraisal:

Under this method, an employee is appraised by a group of appraisers. The group consists if the immediate supervisor of the employee to other

supervisors who have close contact with employee's work, manager or head of the department and consultants.

Confidential Reports:

Assessing the employee's performance confidentially is a traditional method of performance appraisal. Under this method, the superior appraises the performance of his subordinates based on his observations, judgements and intuitions and finally prepares report on it. This method is mostly followed in public sector organizations.

MODERN METHODS

Behaviorally anchored rating scales:

BARS methods combines elements of the traditional rating scales and critical incident methods. Using BARS, job behaviours from critical incident-effective and ineffective behaviours are described more objectively. The method employs individuals who are familiar with a particular job to identify its major components. Then they rank and validate specific behaviour for each of the components.

Human Resource Accounting:

Human Resource Accounting deals with cost of and contribution of human resources to the organization. Cost of the employee includes cost of manpower planning, recruitment, selection induction, placement, training, development wages and benefits etc. Employee service which can be measured by labour productivity or value added by human resources.

Management by Objectives:

Management by objectives is a process whereby the superior and subordinate managers of an organization jointly identify its common goals, define each individuals major areas of responsibility in terms of results expected of him and use these measures of guides for operating the unit and assessing the contribution of its members.

Thus, MBO focuses attention on participatively set goals that are tangible, verifiable and measurable.

Psychological Appraisal:

Psychological Appraisals are conducted to assess the employees potential. Psychological appraisals consist of in depth interviews, psychological tests, consultation and discussion with the employees, discussion with the superiors, subordinates and peers and reviews of other evaluation.

Evaluation is conducted in the areas of employees intellectual abilities, emotional stability, motivational responses, reasoning and analytical abilities, interpretation and judgment skills, social ability. The psychological appraisal results are used for decision about employees placement, career planning and development and training and development.

FACTORS LEADING TO AN EFFECTIVE PERFORMANCE APPRAISAL SYSTEM

- The objective must be made clear to every individual in the organization.
- Every rater and rate must participate in the process.
- The performance appraisal report, format or form should be very accurately prepared so as to extract the maximum information.
- Avoid partiality and politics.
- Provide equal opportunity to all.
- Management should recognize the reward for the best performance in any kind like salary increase, bonus, promotion etc.

NEGATIVE ASPECTS OF PERFORMANCE APPRAISAL

- Negative ratings, partiality and politics may affect the relationship among the employee.
- Improper feedback from the concerned employee.
- Relationship between the superiors and subordinates may be weak.
- Improper flow of information due to communication gap.
- Fear, hesitation and ineffective communication may lead to the gap.
- Evaluating the performance is a long process which leads in time consumption.
- The problem with subjective measure has the opportunity for bias.

REVIEW OF LITERATURE

Review of literature means the researcher presenting the review of all the previous studies, articles published, books published, etc., the researcher would normally classify the chapter in to purpose, methodology and conclusion.

PURPOSE:

The main purpose of performance Appraisal is to provide the research data for improving the overall personnel information system.

The purposes are:

1. To know the effectiveness of performance Appraisal system.
2. To have a brief idea on research topic.
3. To analyze the similar research topic in this field.

An M.B.A project submitted to Alagappa University Karaikudi, Tamilnadu in 2001. This study was conducted among the employees of Touchwood Décor and furniture's limited, U.A.E to find out the Performance Appraisal system followed in the company and majority of the employees in the organization are satisfied.¹

A PH.D in management project submitted to Alagappa University in 2003. This study was conducted in TOROID India Private limited. In order to find out the Performance Appraisal practices in manufacturing sectors. The major objective of the study was to focus some key areas of Human Resources in the company and to derived a conscious effort to bring out a definite a relation ship between the existing Performance Appraisal with that of the job satisfaction level of the employees. It has provided total theoretical framework for the overall effectiveness of the system among all the employees. It was found that there is a relationship between Performance Appraisal and job

¹ T. Rajeswari, *A Study on performance appraisal followed in Touch wood and Decord and Furniture Ltd., UAE. Alagappa University, Karaikudi 2001.*

satisfaction and when the Performance Appraisal properly implemented the creativity of a people increases².

An M.PHIL in management project submitted to Alagappa University, Karaikudi, 2001. The study was conducted in order to find out the effectiveness of current performance Appraisal followed in Volta's limited, Hyderabad unit. It was found that their use in employee development Performance also play a role in administrative decision making. Performance Appraisal are used to link rewards to Performance and to evaluate the effectiveness of HR policies and practice³.

An M.B.A project submitted to Eithiraj College in 2003. The study was conducted find out the Performance Appraisal system on the basis of transaction Analysis of the employees in Indian Airlines and to find out the psychological effects of the Performance Appraisal system in the organization. And it was found that the psychological effects of Performance Appraisal system are less among the employees⁴.

² *Regjaimon Thomas, Performance Appraisal Practices in Manufacturing Sector, A case study of toroid India Pvt. Ltd.*

³ *J. Suresh Kumar, A Study on Performance Appraisal - A Tool for congruent performance at Voltas Ltd., Hyderabad Unit, Alagappa University, Karaikudi 2001.*

⁴ *Ramya Ramasamy, A study on Performance Appraisal based on Transaction Analysis in Indian Air Lines, Ethiraj College, Chennai.*

CHAPTER - III

BHEL – A CORPORATE PROFILE

Bharat Heavy Electricals Limited (BHEL), established in 1956, is a name recognized across the industrial world. It is the largest engineering and manufacturing enterprise of its kind in India and one of the leading international companies in the field of power plant equipment. BHEL offers a wide spectrum of products and services for the core sectors of Economy viz., Power Generation & Transmission, Industry, Transportation, Renewable energy, Oil & Gas, Telecommunication, Defence , etc.

The wide network of BHEL's 14 manufacturing divisions, four Power Sector regional centres, over 100 project sites, 8 service centres and 14 regional offices enable the Company to be closer to its customers and provide them with suitable products system and services at competitive prices .Having Business Excellence through Total Quality Management (TQM). With export presence in more than 50 countries, BHEL is truly India's industrial ambassador to the world.

In the 1960s and 1970s, the unit was operating in a regulated market in which the customers had almost no access to import of power plant equipment. With the inception of NTPC (National Thermal Power Corporation) in 1975, international competition was introduced due to the tender requirements stipulated by World Bank and other multilateral funding agencies. With the economy opening up in 1991, and the onset of liberalization and active encouragement for Foreign Direct Investment (FDI), the market environment became highly competitive for all products of the unit. The globalization now provides the consumers a wider choice for global sourcing to meet increased customer expectations with regard to value chain coverage and value added services.

However, with several strategic initiatives, the company is striving to maintain the growth trends. The plans and targets are reviewed during the middle of the year and more practical targets in the form of Revised Estimates

(RE) are set. The overall results have to be seen with this context in the background. BHEL has sustained the momentum in the midst of fluctuations in the market trends for the core products through innovative strategies.

BHEL- VISION

- A world –class Engineering Enterprise committed to enhancing stakeholder value.

MISSION

- To be an Indian multinational Engineering enterprise providing total business solutions through quality products ,systems and services in the fields of energy, industry ,transportation, infrastructure and other potential areas.

VALUES

- Zeal to excel & zest for change.
- Integrity and fairness in all matters.
- Respect for dignity and potential of individuals.
- Strict adherence to commitments.
- Ensure speed of response.
- Foster learning, creativity and team-work.
- Loyalty & pride in the company.

BHEL, TIRUCHIRAPPALLI – PLANTING POWER FOR PROSPERITY

The Tiruchirappalli Plant of the Bharat Heavy Electricals Limited was set up in 1963 for the manufacture of High Pressure Boilers. The plant was up with technical assistance from Skodaexport under an Indo-Czech economic cooperation programme. In order to meet the rapidly growing power

requirements of the country, BHEL, Tiruchirappalli augmented its capacity to the present level of 4000 MWe a year.

Over the years, the Tiruchirappalli Division has seen a vast growth. The additions have been the Seamless Steel Tube Plant at Tiruchirappalli, the Boiler Auxiliaries Plant at Ranipet, the Piping Centre in Chennai and the Industrial Valves Plant at Goindwal in Punjab.

BHEL, Tiruchirappalli is the largest engineering and manufacturing complex in TamilNadu spread over 2908 acres of land at Tiruchirappalli and 1256 acres at Ranipet. The High Pressure Boiler Plant has a total covered area of 1, 64,588 square meters and the Boiler Auxiliaries Plant, 44,280 square meters. BHEL, trichy complex, one of the major complexes of BHEL today (Turnover Rs.18, 920 millions) and employees above 48000.

MANUFACTURING FACILITIES IN BHEL, TRICHY

The first unit in the complex was the HPBP started in 1963-65. SSTP was set up at Chennai in 1979 to develop piping business in the power and industrial sectors. The manufacturing capacity was expanded in three stages (750 MW to 4000 MW) and during the third stage ;the Boiler Auxiliaries Product Group was shifted to a new plant at Ranipet during 1981-84. With the expansion of Product Profile and capacity in Valves during 1985-87, the industrial Valves plant was set up at Goindwal to manufacture lower sizes and rating of Valves. T Unit is equipped with the state of -art engineering know-how, manufacturing and testing facilities, system, highly skilled labour and dedicated personnel, the company focuses on continuous improvement of quality of products and services .The major products of this unit include Boilers (Power & Industrial),Valves ,Nuclear steam generators and Spares Business. The SSTP plant produces seamless steel tubes/pipes, Rifled and Spiral Finned tubes.

BHEL Tiruchirappalli – High Pressure Boiler Plant is a leading Engineering company engaged in the manufacture of utility boilers, industrial boilers, valves and other equipment for the power utilities and industries. It is

an ISO9001 certified company & has a strong commitment towards TQM. It has been awarded ISO 14000 Environmental Management System certificate.

Equipped with modern in-house manufacturing facilities, BHEL Tiruchirapalli has the technical know-how to design and fabricate various types of boilers of different capacities, operating with different types of Fuels like Lignite, Coke, various Coals, Oil and Gas.

PRODUCT PROFILE

- Utility Steam Generators
- Industrial Boilers including Chemical Recovery Boilers
- Atmosphere Fluidized Bed Boilers
- Circulating Fluidized Bed Boilers
- Heat Recovery Steam Generators
- Heat Exchangers and Pressure Vessels for Petroleum refineries, Chemical, Petrochemical Plants
- Gravimetric feeders
- Soot Blowers
- Dampers
- Valves: High Pressure Valves, Safety & Safety Relief Valves, HPLP(Turbine) By-Pass Valves, Quick Closing Non-Return Valves, Christmas Tree Valves(Oil Field Equipment) etc.
- Nuclear Steam Generators
- Constant Load Hangers
- Piping

The factory has 930,000 Sq. meters (230 acres) of fences area. Within this area is situated 173,000 Sq. meters of covered Shop Floor area equipped with adequate service and handling facilities. BHEL also has a vast storage area

of 300,000 Sq. meters –both covered and open –to store raw materials; semi finished goods, bought out components and finished products.

BHEL, Tiruchirapalli is equipped with State-of-the-Art machines enabling all manufacturing processes like forming, bending, welding, machining, stress relieving etc. About 81 CNC Machines are available.

PRODUCT RANGE

The products manufactures by BHEL, Tiruchirappalli find wide application in Thermal and Nuclear Power Stations and in industries such as fertilizers, petrochemicals, refineries, coal, steel, aluminum, paper, sugar, rubber, cement, oil drilling, mining, etc.

THE HIGH PRESSURE BOILER PLANT PRODUCES:

- Fossils Boilers
- Chemical Recovery Boilers
- Atmospheric Fluidized Bed Combustion Boilers
- Circulating Fluidized Bed Boilers
- Once through Boilers
- Heat Recovery Steam Generators
- Nuclear Steam Generators and Reactor Headers
- Gravimetric Feeders
- Cast and Forged Steel Valves
- Safety and Safety Relief valves
- High Pressure Valves
- QC Non-return Valves
- HP/LP Bypass Systems
- Oil Field Equipment like X-Mas trees and Wellheads
- Soot Blowers

- Heat Exchangers
- Pressure Vessels and Cracking Towers
- Studded Tubes
- Piping and Pipe Fittings
- Constant & Variable Load Hangers

SEAMLESS STEEL TUBE PLANT PRODUCES:

- Seamless Steel Tubes
- Spiral Finned Tubes

**THE BOILER AUXILLIARIES PLANT AT RANIPET
MANUFACTURES:**

- Fans
- Air pre-heaters
- Electrostatic Precipitators

HRD IN –BHEL

HRD organization in BHEL can be discussed under Personal and HRD headings. Basically all aspects of human resources are covered under the personal function. The HRD department is a new development which is one step towards adopting the human resource approach in its true spirits. The erstwhile training and development departments have been renamed as HRD departments. The personnel function (including HRD) in BHEL is headed by a full time functional Director. In line with the corporate policy of centralized policy making and decentralized administration, the personnel activities are performed at two tires-Corporate level and unit level. Decisions on personnel matters are effected through a hierarchy of advisory/decision making bodies.

THE MAIN FUNCTIONS OF HUMAN RESOURCE COMMITTEE.

The main functions of the committee are as follows

1. To assess and analyze the extent human assets of the Unit, both in qualitative and quantitative aspects.
2. To formulate man-power plans for the unit.
3. To implement such corporate policies and plans of action for recruitment as may be applicable to the unit.
4. To guide the placement / redeployment of available human resources to meet organizational requirements.
5. To identify training needs of the various categories of employees including needs for retraining, where necessary, and formulate action – plan for ensuring fullest development of human resources in the unit.
6. To formulate policies and plan of action for organization development and management development programme, ensure effective implementation.
7. To review and improve the performance appraisal system to include projection of development needs of the appraises and ensure follow-up action.
8. To plan the career advancement of the employees in consonance with organization requirements and provide for their developmental such plans being integrated with the individuals' background, interest and capabilities.
9. To review the operation of incentive bonus scheme, overtime, etc.
10. To ensure effective functioning of Grievance procedure, suggestion Scheme and such other schemes relating to human resources.
11. To organize research in the areas of human resource management and initiate appropriate strategies that all will improve quality of work –life, commitment, creativity, etc.

12. To promote participative style of management at all levels in the organization.
13. To ensure effectiveness of the various employee welfare services in the plant and township.
14. To revamp personal information system and development needs and training received by the various categories of employees.
15. To render all assistance and support needed by the Corporate Personnel.
16. To introduced and ensure effective implementation of action learning programmes

ISO-9000 & 14001 CERTIFICATION

In 1993, the High Pressure Boiler Plant, the Seamless Steel Tube Plant and the Boiler Auxiliaries Plant of BHEL, Tiruchirappalli were awarded the ISO-9000 and ISO-9002 certification for various products.

To meet its commitment for achieving sustainable growth in line with the global environmental standards, BHEL, Tiruchirappalli has been accredited to ISO14001 Environmental Management Systems in June 2000. The Certification covers both the High Pressure Boiler Plant and the Seamless Steel Tube Plant and includes all activities related to the design and manufacture of boilers, associated boiler auxiliaries, pressure vessels, heat exchangers, valves, Christmas tree distribution system & wellhead equipment and the manufacture of seamless steel spiral finned tubes and pipes.

Never satisfied with achievements on the quality front, BHEL, Tiruchirappalli continues to strive to achieve Business Excellence through Total Quality Management.

GLOBAL LINKS

These achievements have earned an international reputation for BHEL, Tiruchirappalli which has fulfilled export orders. It has so far supplied boilers for about 810 MWe of power generation capacity for export orders from countries like Malaysia, Libya, Iran, Egypt, Bangladesh, etc. BHEL's valves have been exported to Malta, Cyprus, Malaysia, Singapore, Indonesia, USA, Japan and Syria while pressure part-items have been exported to USA, boiler components to China and Seamless Steel Tubes.

PEOPLE –OUR GREATEST ASSET

Behind each one of these lies the commitment and dedication of over 11,000 employees. Technical experts, process engineers skilled workers who have contributed their mile to penning this success story.

BHEL, Tiruchirappalli is the proud winner of successive productivity awards and the 'Sword of Honour' from the British Safety Council. The

President of India has awarded the shield for the Best Employer of Physically Handicapped Persons to BHEL, Tiruchirappalli. Viswakarma National Awards and Young Engineer Awards and Young Engineer Awards have been won in successive years by the employees of **BHEL**, Tiruchirappalli.

BHEL, Tiruchirappalli has won goodwill and sustained support for its employee welfare schemes. A township to ensure housing, the Sir C V Raman Science Centre, number of schools and hospital form the core of these schemes.

BHEL, Tiruchirappalli has pioneered the establishment of occupational health services for ensuring its employees a healthy and productive life. Periodic health screening programmes are carried out. Occupation-related health issues are studied with great care to ensure proper work design.

As a responsible corporate citizen BHEL, Tiruchirappalli has adopted several neighboring villages to provide comprehensive utility services.

CHAPTER - IV

DATA ANALYSIS AND INTERPRETATION

This section forms the main part of the research study. The collected data are analyzed and interpreted in this section.

SOCIO -DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Table - 1
Distribution of Respondents Based on Age

S.No	Age	No. of Respondents
1.	21-30	2
2.	31-40	32
3.	41-50	54
4.	51-60	12
Total		100

Source: Primary Data

INTERPRETATION:

From the above table with regard to age 2% of the respondents are in the age group of 21-30 years. 32% are in the age group of 31-40 years and 54% are in the age group of 41-50 years and the rest of the 12% are in the age group of 51-60 years.

CHART - 1

Distribution of Respondents Based on Age

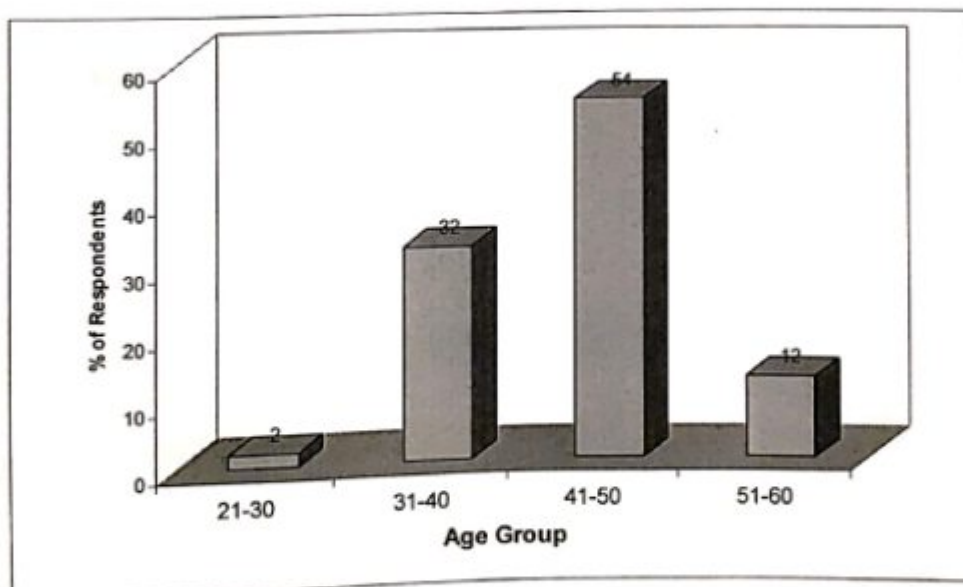


Table - 2

Distribution of respondents based on educational Qualification wise

S.No	Educational qualification	No. of Respondents
1	Primary	00
2	Secondary	00
3	Under Graduate	38
4	Post Graduate	55
5	Diploma	7
Total		100

Source: Primary Data

Interpretation:

Regarding educational qualification, 38% of the respondents have under graduation qualification. Post graduates are about 55% and rest of the 7% constitute of Diploma holders.

Chart - 2

Distribution of respondents based on educational qualification wise

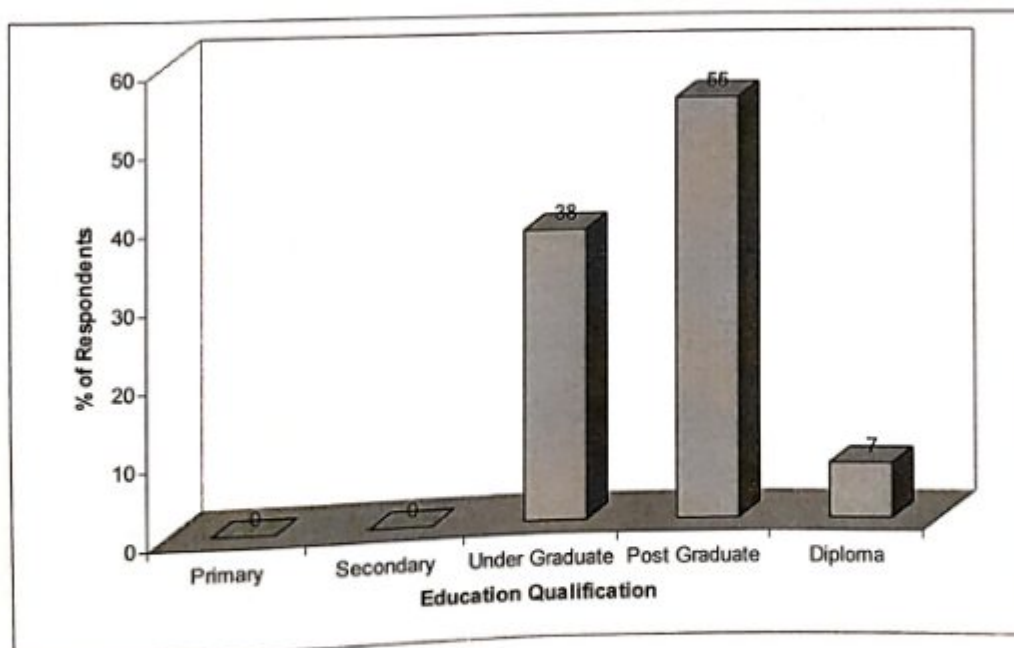


Table - 3
Distribution of Respondents based on the Martial Status

S.No	Martial Status	No. of Respondents
1.	Married	89
2.	Unmarried	11
Total		100

Source: Primary Data

INTERPRETATION:

Taking martial status into consideration, it was found that 89% of the respondents were married and remaining 11% are unmarried.

From the above analysis, it is inferred that the company has both married and unmarried persons.

Table - 4
Distribution of Respondents based on Experience

S.NO	EXPERIENCE	NO. OF RESPONDENTS
1	5-10 years	23
2	11-15 years	29
3	16-20 years	26
4	Above 21 years	22
Total		100

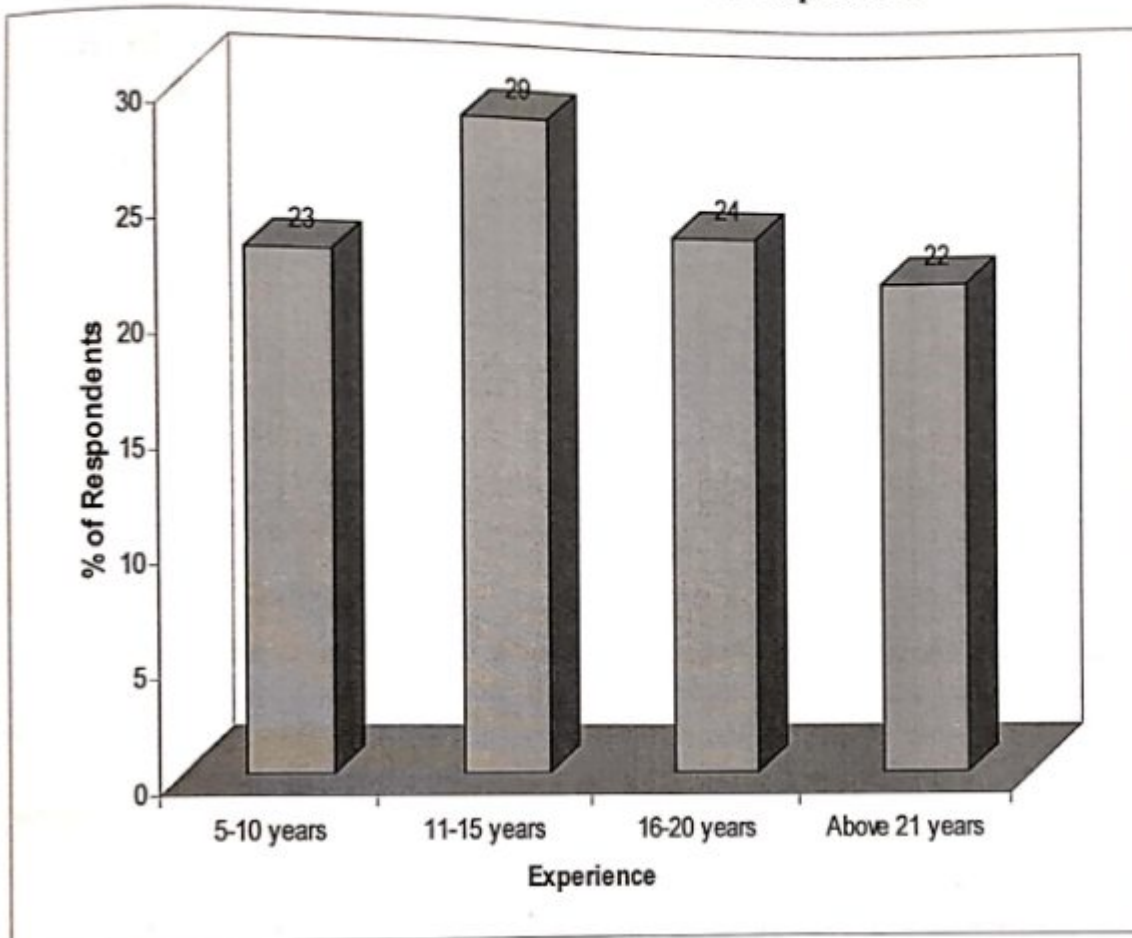
Source: Primary Data

INTERPRETATION:

Regarding experience, 23% of the respondents are below 10 years, 29% of them are 11-15 years, 26% of them are between 16-20 years and 22% of them are above 21 years.

Chart - 3

Distribution of Respondents based on Experience



**TABLE SHOWING THE RESULTS BASED ON THE INTERVIEW
SCHEDULE (APPRAISEE)**

Table - 5

Distribution of Respondents based on their response related to the awareness about the Performance Appraisal Policy.

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

In this above table, 100 % of the respondents are aware about the performance appraisal policy of the organization and no one is unaware of the performance appraisal of the organization.

Table - 6

Distribution of Respondents based on their response related to effectiveness of the Performance Appraisal System

S.No	Response	No. of Respondents	Percentage
1	Effective	50	100
2	Ineffective	-	-
3	No Comments	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

In the above table, 100% of the respondents are feeling that the current performance appraisal system is effective, no one feels that the system is ineffective.

Table - 7

Distribution of Respondents based on their response related to the satisfaction level towards the Frequency of Appraisal System

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that all the employees are fully satisfied with the frequency of the Appraisal system.

Table - 8

Distribution of Respondents based on their response related to the satisfaction level towards the present method of performance evaluation system

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that, cent percent of the respondents are satisfied with the present evaluation system and no one are dissatisfied with the evaluation system.

Table - 9

Distribution of Respondents based on their response related to the satisfaction level towards the Higher Authorities Treatment

S.No	Response	No. of Respondents	Percentage
1	Satisfied	50	100
2	Dissatisfied	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table, shows that all the employees are fully satisfied with the authorities treatment.

Table – 10

Distribution of Respondents based on their response related to the feedback given after the appraisal

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that all the employees receive feedback after the appraisal.

Table – 11
Distribution of Respondents based on their relationship between the
Employers and Employees

S.No	Response	No. of Respondents	Percentage
1	Very good	34	68
2	Good	14	28
3	Neutral	2	4
4	Bad	0	0
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that, 68% of the respondents have very good relationship with their supervisors, 28% of the respondents have good relationship with the supervisors and 2% of the employees feel that the relationships with their superiors are neutral.

Chart – 4

Distribution of Respondents based on their response related to the
feedback given after the appraisal

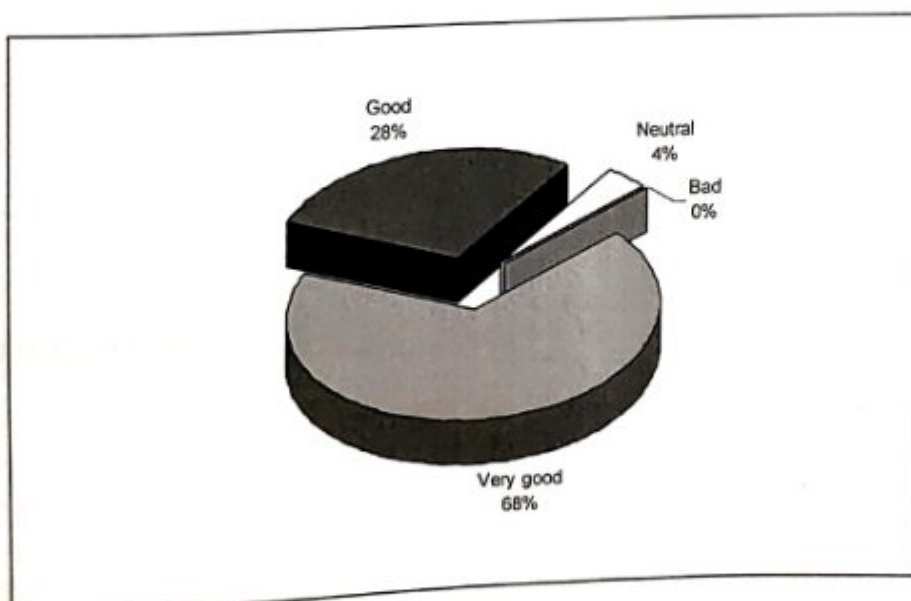


Table – 12

Distribution of Respondents based on their response related to appraisals motivating their activities

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that, 100% of the respondents feel that appraisals motivate their work activities and no one feel that appraisals don't motivate their work activities.

Table – 13

Distribution of Respondents based on their response related to the discrimination done through Current Appraisal System

S.No	Response	No. of Respondents	Percentage
1	Yes	1	2
2	No	49	98
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that 98% the employees feel that there is no discrimination done through current performance appraisal system and only 2% of the employees feel that there is discrimination done through this system.

Chart – 5

Distribution of Respondents based on their response related to the discrimination done through Current Appraisal System

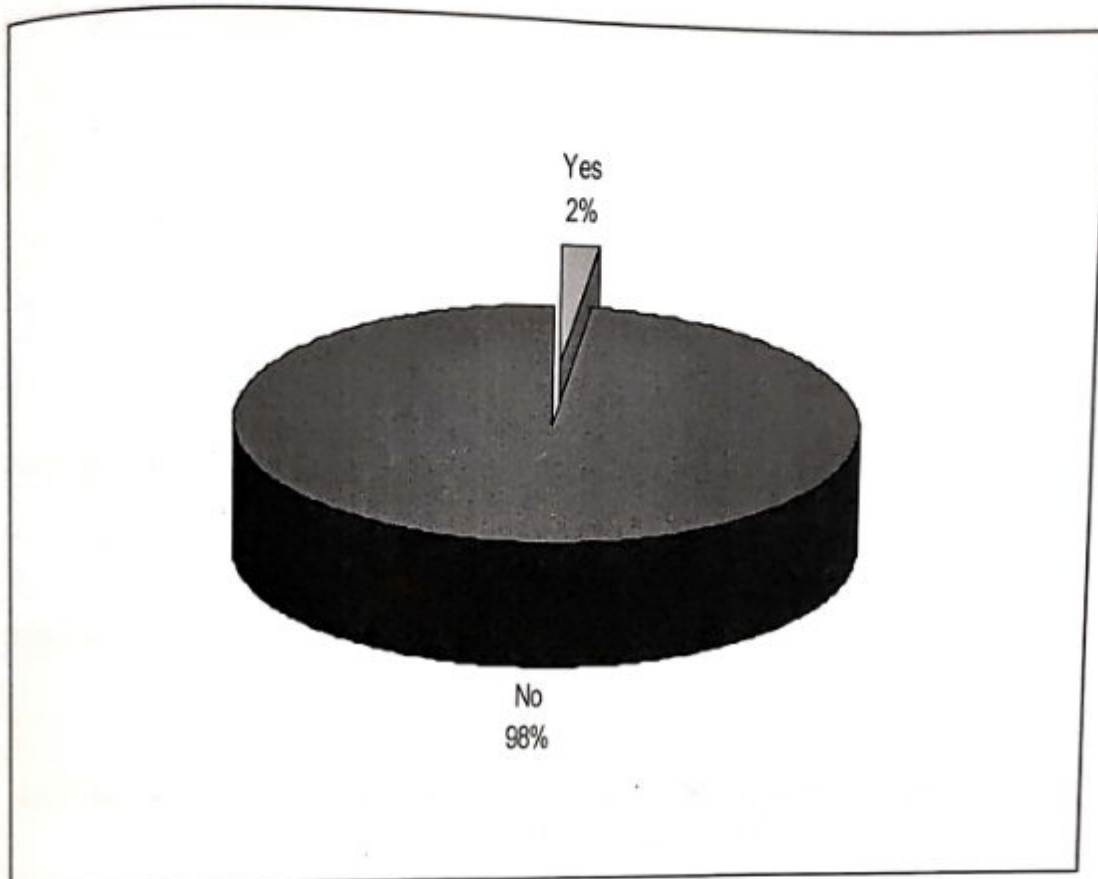


Table – 14

Distribution of Respondents based on their response related to the Training and Counseling Programme

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that, all the respondents convey that the management provide them sufficient 'training and counseling programme.

Table – 15

Distribution of Respondents based on their response related to the Stress exerted by the Performance Appraisal System

S.No	Response	No. of Respondents	Percentage
1	Yes	-	-
2	No	50	100
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that all the employees feel that there is no stress exerted on their work schedules by the performance appraisal system.

Table – 16

Distribution of Respondents based on their response related to the Self Appraisal Method

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

From the above analysis, it is inferred that 100% of the employees follow a self appraisal method which will surely motivate the employees.

Table – 17

Distribution of Respondents based on their response related to the attitude towards the working of Performance Appraisal System

S.No	Response	No. of Respondents	Percentage
1	Positively	50	100
2	Negatively	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

From the above analysis, all the employees feel that the system is positively working towards the organizational goals. And all the employees are very much satisfied with the system.

Table – 18

Distribution of Respondents based on their response regarding their preference level for single or multiple raters

S.No	Response	No. of Respondents	Percentage
1	Single	9	18
2	Multiple	41	82
Total		50	100

Source: Primary Data

INTERPRETATION :

Above table shows that 82% of respondents prefer multiple rater for rating them. From the above analysis, it is inferred that multiple rater always rate effectively than single raters and the respondents feel that the exploitation of the subordinate under single superior can be reduced.

Chart – 6

Distribution of Respondents based on their response regarding their preference level for single or multiple raters

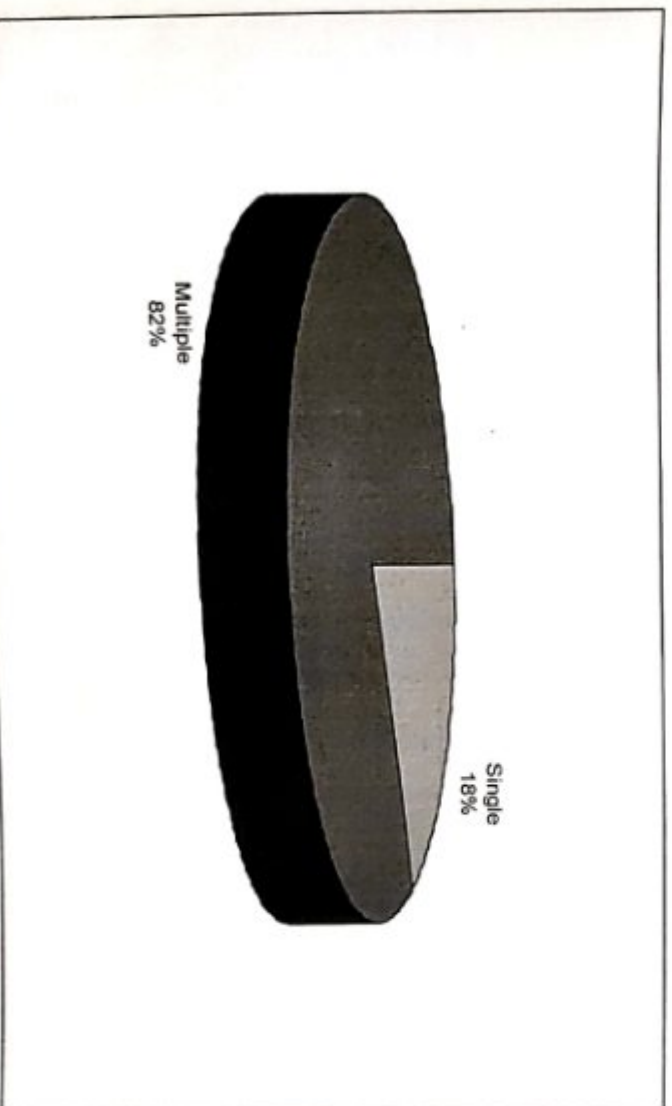


Table -- 19
Distribution of Respondents based on their response regarding the Appraisal Purpose

S.No	Response	No. of Respondents	Percentage
1	Promotion	-	-
2	Incentives	50	100
3	Other rewards	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that 100% of the respondents prefer appraisal for incentives. From the analysis, it is inferred that the company has a very efficient appraisal process.

TABLES SHOWING THE RESULTS BASED ON THE INTERVIEW SCHEDULE (APPRAISER)

Table -- 20

Distribution of Respondents based on their response showing the Frequency of Appraisal

S.No	Frequency	No. of Respondents	Percentage
1	Yearly	-	-
2	Half Yearly	50	100
3	Monthly	-	-
4	Whenever Required	-	-
5	Occasionally	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

In the above table, 100% of the respondents are been evaluated half yearly.

Table – 21

Distribution of Respondents based on their response regarding the satisfaction level towards the working of the Performance Appraisal System

S.No	Response	No. of Respondents	Percentage
1	Satisfied	47	94
2	Dissatisfied	3	6
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that, 94% of the employees are satisfied with the working of the system and 6% of them are dissatisfied with the present system.

Chart – 7

Distribution of Respondents based on their response regarding the satisfaction level towards the working of the Performance Appraisal System

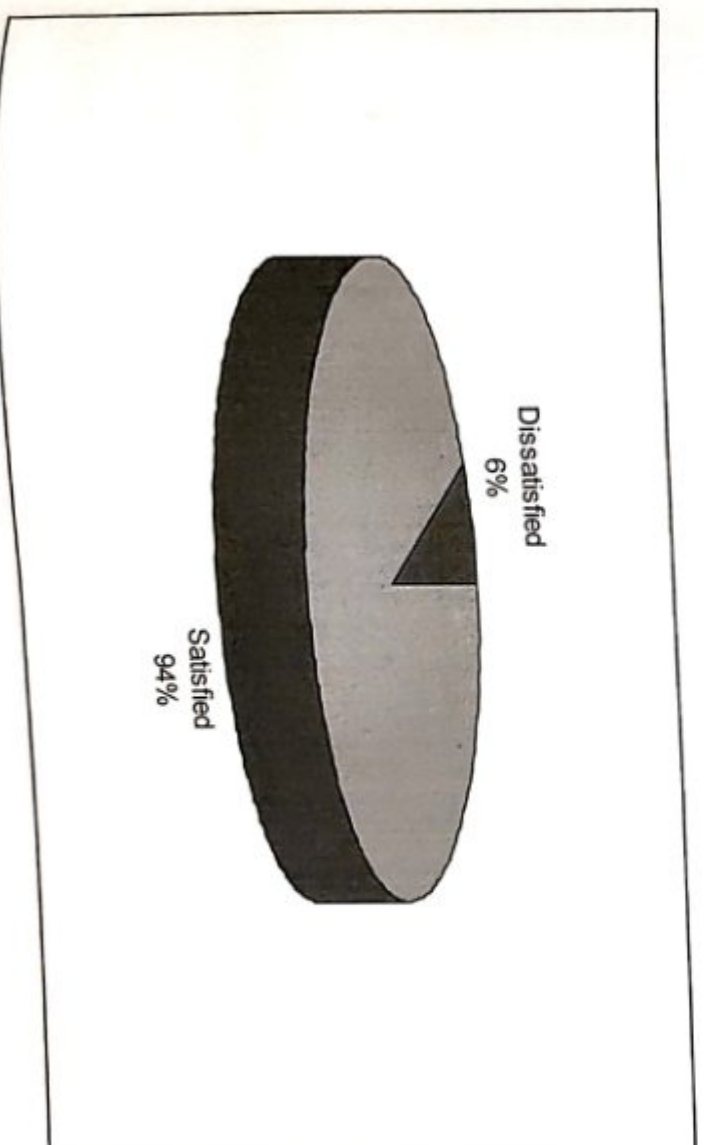


Table – 22

Distribution of Respondents based on their response regarding the importance level given to the Past Performance

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

The above table shows that all the appraisers are giving importance to the past performance.

Table – 23

Distribution of Respondents based on their response related to the Pay for Performance method

S.No	Response	No. of Respondents	Percentage
1	Yes	50	50
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that all the employees are encouraging the policy of pay for performance and they want it to be followed always.

Table – 24
Distribution of Respondents based on their response regarding the constraint level faced in the Appraisal System

S.No	Response	No. of Respondents	Percentage
1	Yes	-	-
2	No	50	100
Total		50	100

INTERPRETATION

Above table shows that 100% of the respondents don't face any constraint with the evaluation of the performance appraisal system.

Table – 25

Distribution of Respondents based on their response regarding the raters being informed in advance about the Appraisal System

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that all the respondents are informed about the appraisal system well in advance.

Table – 26

Distribution of Respondents based on their response regarding their preference level for Single rater or multiple raters

S.No	Response	No. of Respondents	Percentage
1	Single	2	4
2	Multiple	48	96
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that 100% of the respondents prefer multiple rater for rating.

Chart – 8

Distribution of Respondents based on their response regarding their preference level for Single rater or multiple raters

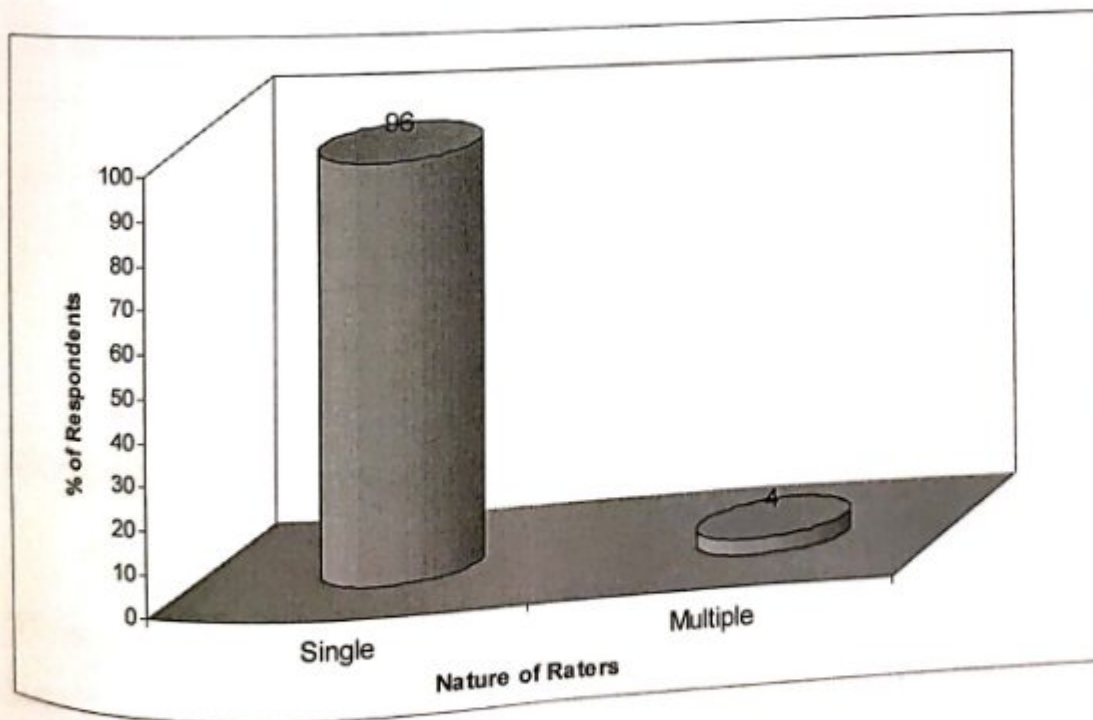


Table – 27

Distribution of Respondents based on their response regarding the Judgement based Performance Appraisal

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that, all the appraisal follow performance based on judgement.

Table – 28

Distribution of Respondents based on their response regarding the openness of supervisors towards the employees about Appraisal Method and Feedback Level

S.No	Response	No. of Respondents	Percentage
1	Yes	50	100
2	No	-	-
Total		50	100

Source: Primary Data

INTERPRETATION:

Above table shows that all the respondents feel that their supervisors are open to the workers and the feedback is also given to the workers for corrective action.

Table – 29

Distribution of Respondents based on their response regarding the rating level about the current Performance Appraisal System

S.No	Response	No. of Respondents	Percentage
1	Very good	19	38
2	Good	26	52
3	Satisfactory	4	8
4	Poor	1	2
Total		50	100

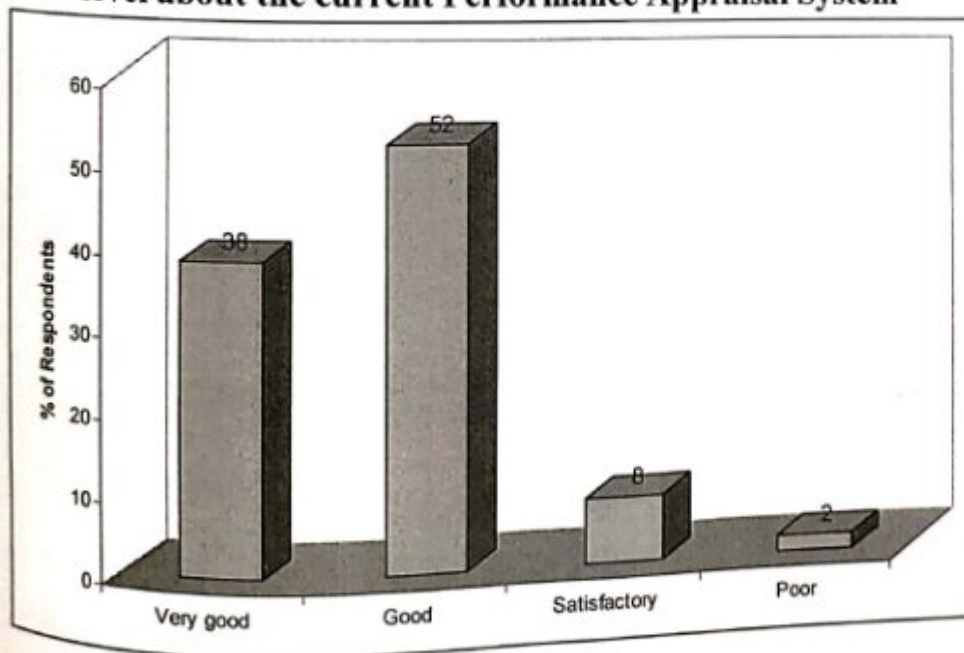
Source: Primary Data

INTERPRETATION:

Above table shows that, 38% of the respondents feel that the present system is very good, 52% the respondents feel that the current performance appraisal system is good, 8% feel that the current system is satisfactory and rest 2% feel that the system is poor.

Chart – 8

Distribution of Respondents based on their response regarding the rating level about the current Performance Appraisal System



CHAPTER – V

FINDINGS AND SUGGESTIONS

FINDINGS:

- All the employees are aware about the existence of performance appraisal system followed in the organization and majority of the employees feel that the current performance appraisal system is effective.
- The performance appraisal system is followed half yearly. All the employees are fully satisfied with the frequency of the current appraisal system..
- The employees working are more experienced as 54% of them fall in the age between 41 years to 50 years.
- The organization provides apprenticeship training, employee training and counseling programmes through HRD which is very useful and informative for the employees.
- Majority of the employees are satisfied with the present method of performance evaluation system.
- All the employees are satisfied with the higher authorities treatment as their mutual relationships between them are highly satisfiable.
- All the employees receive proper feedback, immediately after the performance appraisal.
- All the employees feel that the appraisal system motivates them towards their contribution.
- 49% of the employees feel that there is no discrimination done through the current appraisal system.

- All the employees prefer pay or incentives for the performance appraisal.
- No employee feel that there is any stress exerted on their work schedules by the performance appraisal system.
- The organization follows the self appraisal method and past performance is also considered for the evaluation.
- All the employees have positive attitude towards the performance appraisal system
- Majority of the employees does not feel the appraisal system as burden to them in fact show their involvement in it.
- All the employees are informed in advance about the performance appraisal system and prefer multiple raters to rate them, in order to reduce the work.

SUGGESTIONS

- Manager should spend sufficient time and discuss with the sub ordinates about their performance. They should try to analyze their strength and weakness of their subordinates and advice them for correcting the weakness through performance review meetings.
- Currently the management in the organization is following Appraisal System based on the managerial level only, instead of that 360° performance appraisals can be followed so that all the employees as well as the workers are included in the appraisal system. Thus the contribution of all the levels can be increased.
- .Department wise the appraisal system can be followed so that the work at the same level can be evaluated easily.

- As the current appraisal system follows promotion for the performance. In spite of it, the employees mostly prefer incentive or pay system.
- The organization is presently following single instead of that the multiple raters can be used for the appraisal purpose in order to reduce the bias.
- Nearly 2% of the feel that the current performance appraisal system discriminates them. So this discrimination can be avoided and eradicated completely by identifying their problem and solving them.
- Training and counseling programmes can be modified accordingly in order to avoid boredom.
- Frequency level of appraisal can be extended to at least 1 year so the employees can get sufficient time to improve their performance.
- Past performances are considered while appraising. Past performance need not be considered as it is a previous record.
- There is no benefits for the raters who work to rate them. So the raters can be provided with rewards and incentives for the best rater so that, they contribute well.
- The raters can be asked to give the reason for low ratings so that the employees can improve their performance.

CONCLUSION

BHEL is one among the largest enterprises in the world. It has always been succeeding from its existence because of the efforts and contribution of the management and employees towards the organization.

From this study the researcher has come to an conclusion that the effectiveness of the current performance Appraisal system in the organization

is towards the maximum. The organization feels that it is a motivating tool to the employees and follows it in order to get the maximum output from the employees. Though there is a very small amount of dissatisfaction shown towards the appraisal system, it can be complete eradicated by making some innovative modifications.

All these efforts and hard work of the management as well as each an every employees is the secret behind the successful proceedings of the enterprise.

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INTERVIEW SCHEDULE

1. Name : _____
2. Age : 21-30/ 31-40/ 41-50/ 51-60
3. Gender : _____
4. Martial Status : _____
Unmarried / Married / _____
5. Department : _____
6. Designation : _____
7. Income : _____
8. Years of Service : _____
9. Educational Qualification : _____
10. Are you aware about the performance appraisal policy of your organization?
Yes/No.
11. What is your opinion about it?
Effective / Ineffective
12. How frequently your performance is appraised?
 - Yearly
 - Half yearly
 - Monthly
 - Whenever Required
 - Occasionally
13. Are you satisfied with the frequency of performance appraisal?
Yes/No. If No, state the reasons.
14. Are you satisfied with the present evaluation system?
Yes/No. If no, state the reasons.
15. What are the errors, which you find in your performance appraisal?

16. Are you satisfied with your higher authorities treatment?
Yes/No. If no, state the reasons.
17. Do you have full support from the top management for your work schedules?
Yes/No.
18. How is your relationship with your supervisor?
Very good/Good/Neutral/Bad.
19. Do you have any discomfort with the working environment? If so, kindly state.
20. Does performance appraisal in your organization work positively or negatively?
21. Are you informed about the system well in advance?
22. Do you feel that appraisals motivate your activities?
Yes/No. If no, state the reasons.
23. Are you having any discrimination done through current performance appraisal?
Yes/No. If no, state the reasons.
24. Do you encourage pay for performance method ?
Yes/No.
25. What are your expectations from the organization in the performance appraisal system?
26. Whether the management provides any counseling/training to you for reaching the performance appraisal standard?
Yes/No. if yes, state the nature.
27. What is the reward for your performance in the organization?
28. Does this appraisal system exert stress or pressure on your routine work schedules?
Yes/No. If yes, in what way?
29. Do you have self appraisal method?
Yes/No. If yes, in what way?

30. Give your opinion about the present performance appraisal system used in the organization?

31. What are the suggestions you offer for improving the effectiveness of the performance appraisal system?

**A STUDY ON M-FUZZY SUBGROUPS AND
ITS LEVEL M-SUBGROUPS**

*Submitted in partial fulfillment of the
Requirement for the degree
Of*

**MASTER OF SCIENCE IN MATHEMATICS
Of
BHARATHIDASAN UNIVERSITY**

Submitted by

KR. PADMAPRIYA

Reg.No:P20190501

Under the guidance of

Prof. Mr. K. ANAND, M. Sc., B.Ed.,



**DEPARTMENT OF MATHEMATICS
GANESAR COLLEGE OF ARTS AND SCIENCE
(Affiliated to BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI)
Melaisivapuri-622 403
April-2022**

**A STUDY ON LEVEL SUBGROUP HOMOMORPHISM IN
FUZZY LEVEL SUBGROUP**

*Submitted in partial fulfillment of the
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**MASTER OF SCIENCE IN MATHEMATICS
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BHARATHIDASAN UNIVERSITY

Submitted by

V. BHAVANI

Reg. No: P20190502

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Submitted by

A. DHANAM

Reg.No:P20190503

Under the guidance of
Prof. Mrs.V. AMUTHA, M.Sc., M.Phil., B.Ed., PGDCA., MCA.,



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April-2022**

**A STUDY ON FUZZY WING GRAPH AND THEIR
PROPERTIES**

*Submitted in partial fulfillment of the
Requirement for the degree
Of*

**MASTER OF SCIENCE IN MATHEMATICS
Of
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Submitted by

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Reg.No:P20190504

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April-2022**

**A STUDY ON LATTICE OF FUZZY NUMBERS AND
PROPERTIES**

*Submitted in partial fulfillment of the
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**A STUDY ON THE CLASSICAL THEORY OF
REARRANGEMENTS**

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A STUDY ON α – FUZZY SUBGROUPS

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**A STUDY ON FUZZY SYMMETRIC SOLUTIONS OF
FUZZY MATRIX EQUATIONS**

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A STUDY ON CONNECTIVITY IN FUZZY GRAPH

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A STUDY ON FUZZY RELATION

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**A STUDY ON DETERMINANT AND ADJOINT OF FUZZY
SQUARE MATRIX**

*Submitted in partial fulfillment of the
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**A STUDY ON PENTAGONAL FUZZY NUMBER AND
ITS CORRESPONDING MATRICES**

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**A STUDY ON GENERALIZED INVERSE OF BLOCK
INTUITIONISTIC FUZZY MATRICES**

*Submitted in partial fulfillment of the
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NORM AND PROPERTIES**

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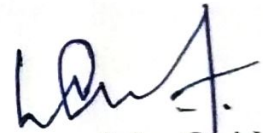
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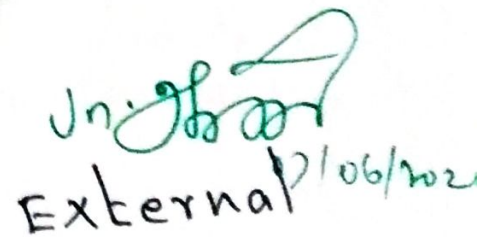


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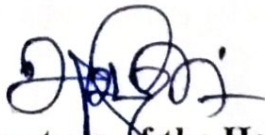


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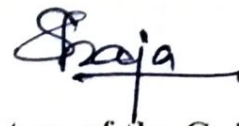
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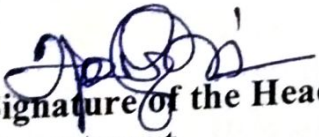
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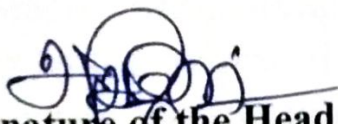

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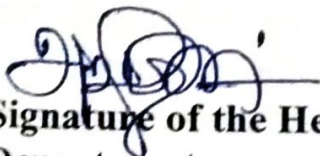


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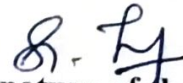
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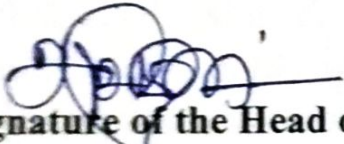


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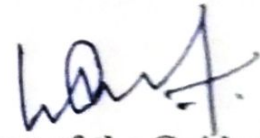
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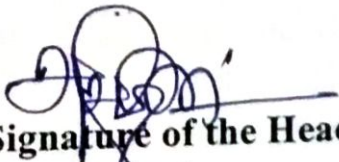
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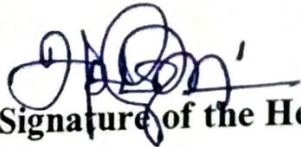


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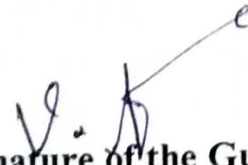
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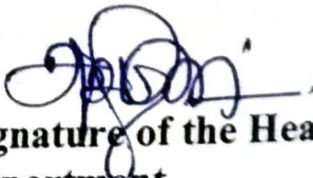
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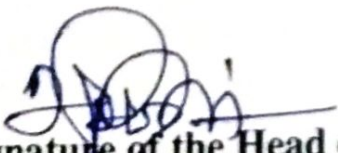
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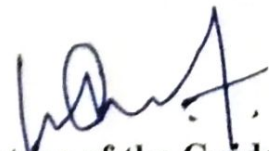
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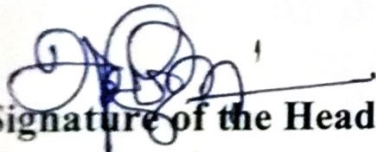


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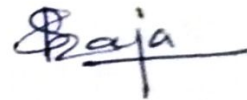
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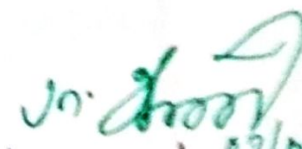


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**A STUDY ON GENERALIZED INVERSE OF BLOCK
INTUITIONISTIC FUZZY MATRICES**

*Submitted in partial fulfillment of the
Requirement for the degree
Of*

**MASTER OF SCIENCE IN MATHEMATICS
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Under the guidance of
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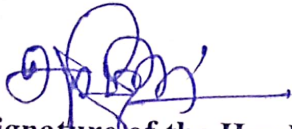


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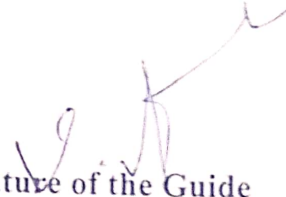
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DECLARATION

I hereby declare that the dissertation entitled, “**A STUDY ON GENERALIZED INVERSE OF BLOCK INTUITIONISTIC FUZZY MATRICES**” submitted to the Ganesar college of Arts & Science is a partial fulfillment of the requirements for the award of the degree of master of science in mathematics is a record of work by me during the period 2021-2022 of my study in the Department of Mathematics, Ganesar College of Arts & Science, Melaisivapuri under the guidance and dissertation has not formed the award of my Degree, Diploma, Associate Ship, fellowship or other similar title to the candidate of university.

Place: Melaisivapuri
Date: 07 . 06 . 2022

N.Vijayarani
Signature of the candidate



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ABSTRACT

In this paper, we define multiplication between intuitionistic fuzzy matrices (IFMs) and we derive the conditions for a block IFM to be regular. Also a method to find the generalized inverse of it with the help of the generalized inverses of the blocks of the original matrix is described. Again, it is shown that a block intuitionistic fuzzy matrix can be decomposed into an upper triangular idempotent intuitionistic fuzzy matrix and a lower triangular idempotent intuitionistic fuzzy matrix when the decomposition is symmetric.

INTRODUCTION

Partitioning of matrices is useful to effect addition and multiplication by handling smaller matrices. If we draw horizontal lines between rows and / or vertical lines between columns, the sub-matrices obtained are called blocks or cells of the matrix $A = [a_{ij}]_{m \times n}$. When a matrix is very large and it is not possible to store the entire matrix into the primary memory of a computer at a time, then matrix partition method is used to perform the operation on matrices. There are lot of advantages noted in partitioning an intuitionistic fuzzy matrix A into blocks or cells. It exhibits some smaller structure of A and thus save spaces. It also simplifies computations.

First time Pal introduced intuitionistic fuzzy determinant. Latter Pal and Shyamal introduced intuitionistic fuzzy matrices and distance between intuitionistic fuzzy matrices. Meenakshi and Jenitastudied on k-regularity of block fuzzy matrix and Schur complement in k-kernel symmetric matrices. Pradhan and Pal proposed a method to find the g-inverse of intuitionistic fuzzy matrices.

In this paper, we obtain the conditions for a block intuitionistic fuzzy matrix to be regular and propose a method to determine the g-inverse of it with the help of the g-inverses of it blocks. Here, we also shown that if a block intuitionistic fuzzy matrix is idempotent then its diagonal blocks are also idempotent. Here we proved that a block intuitionistic fuzzy matrix can be decomposed into an upper triangular idempotent intuitionistic fuzzy matrix and a lower triangular idempotent intuitionistic fuzzy matrix and the decomposition is symmetric.

CHAPTER-I

Preliminaries

Definition: 1.1

A Set is a collection of well defined objects. The objects of a set are called the member or elements of the set.

Example:

The set of all positive even integers between 2 to 100

Definition: 1.2

A membership function of a fuzzy set A on the universe of discourse of X is defined as $\mu_A : X \rightarrow [0, 1]$ where each element of X is mapped to a value between 0 and 1.

This value called membership value or degree of membership quantifiers the grade of membership quantifiers the grade of membership of the elements in X to be fuzzy set A.

Example:

Let $X = \{g_1, g_2, g_3, g_4, g_5\}$ be the reference set of students

Let A be the fuzzy set of "smart" students where fuzzy set is "smart" students

$$A = \{(g_1, 0.4), (g_2, 0.5), (g_3, 1), (g_4, 0.9), (g_5, 0.9)\}$$

Hence A indicates that the smartness of g_1 is 0.4 and so on.

Definition: 1.3

An intuitionistic fuzzy set forms an intuitionistic fuzzy algebra with two binary operations addition and multiplication if it satisfy the following properties:

- (1) Idempotence : $a+a=a$, $a.a=a$
- (2) Commutativity : $a+b=b+a$, $a.b=b.a$
- (3) Associativity : $a+(b+c)=(a+b)+c$, $a.(b.c)=(a.b).c$
- (4) Absorption : $a+(a.b)=a$, $a.(a+b)=a$
- (5) Distributivity : $a.(b+c)=(a.b)+(a.c)$ & $a+(b.c)=(a+b).(a+c)$
- (6) Universal bounds: $a+0=a$, $a+1=1$; $a.0=0$, $a.1=a$.

It can be shown that an intuitionistic fuzzy set is an intuitionistic fuzzy algebra with respect to max-min composition.

Example:

Let A be an Intuitionistic fuzzy set with $\mu_A(x) = 0.5$ and $V_A(x) = 0.3$

$$\begin{aligned}\pi_A(x) &= 1 - [\mu_A(x) + V_A(x)] \\ &= 1 - [0.5 + 0.3] \\ &= 0.2\end{aligned}$$

Definition: 1.4

Set A is said to be a **subset** of Set B if all the elements of Set A are also present in Set B. In other words, Set A is contained inside Set B.

A subset is denoted by the symbol \subseteq .

Example:

$A \subseteq B$; which means Set A is a subset of Set B.

A subset can be equal to the set. That is, a subset can contain all the elements that are present in the set.

Definition: 1.5

A fuzzy subset "A" in a set X defined to be a function $A: X \rightarrow [0,1]$. The function is also called a membership function. More generally one can use a complete lattice L in a definition of a fuzzy subset A .

Example:

Let S be a nonempty set, then a fuzzy subset of S is a map S from S into the real interval $[0,1]$.

Definition: 1.6

Intuitionistic fuzzy subset:

$A = \{ \langle x, \mu_A(x), \nu_A(x) \rangle / x \in X \}$. Let $X = \{a, b, c\}$ be a set.

Then $A = \{ \langle a, 0.52, 0.34 \rangle, \langle b, 0.14, 0.71 \rangle, \langle c, 0.25, 0.34 \rangle \}$ is an Intuitionistic fuzzy subset.

Definition: 1.7

Let V be a vector space over a field F .

A non-empty subset W of V is called a **Subspace** of V if W itself is a vector space over F under the operations of V .

Definition: 1.8

A fuzzy set F in a vector space E is called **Fuzzy subspace** of E if

(i) $F + F \subset F$

(ii) $\alpha F \subset F$, for every scalars α .

Definition: 1.9

Let W be an intuitionistic fuzzy subspace of V_n and S be a subset of W such that the elements of S are independent. If every element of W can be expressed uniquely as a linear combination of the elements of S , then S is called a basis of **Intuitionistic fuzzy subspace** W .

Definition: 1.10

A **Matrix** is a rectangular array of numbers. An $n \times m$ matrix is a matrix with n rows and m columns (the dimension of the matrix).

If A is a matrix then $a_{i,j}$ denotes the individual item in row i and column j (called an element of the matrix).

Example:

$$A = \begin{pmatrix} -1 & 2 & 2 \\ 0 & -2 & 3 \end{pmatrix} \text{ is a } 2 \times 3 \text{ matrix,}$$

$$a_{11} = -1, a_{12} = 2, a_{21} = 0 \text{ and so on.}$$

Definition: 1.11

$$\text{Let } X = \{x_1, x_2, \dots, x_n\}, Y = \{y_1, y_2, \dots, y_m\}.$$

The fuzzy relation $R(X,Y)$ can be expressed by $n \times m$ matrix is called **fuzzy matrix**.

$$R(X,Y) = \begin{pmatrix} \mu_R(x_1, y_1) & \mu_R(x_1, y_2) & \dots & \mu_R(x_1, y_m) \\ \mu_R(x_2, y_1) & \mu_R(x_2, y_2) & \dots & \mu_R(x_2, y_m) \\ \dots & \dots & \dots & \dots \\ \mu_R(x_n, y_1) & \mu_R(x_n, y_2) & \dots & \mu_R(x_n, y_m) \end{pmatrix}$$

Example:

$X = \{a, b, c\}$. Then a fuzzy relation R on X may be:

$$R = 0.2/(a,a) + 1/(a,b) + 0.4/(a,c) + 0.6/(b,b) + 0.3/(b,c) + 1/(c,b) + 0.8/(c,c)$$

(OR)

$$R = \begin{bmatrix} 0.2 & 1 & 0.4 \\ 0 & 0.6 & 0.3 \\ 0 & 1 & 0.8 \end{bmatrix}$$

Definition: 1.12

An **Intuitionistic fuzzy matrix (IFM)** A of order $m \times n$ is defined as

$A = [x_{ij}, \langle a_{ij\mu}, a_{ij\nu} \rangle]_{m \times n}$ where $a_{ij\mu}, a_{ij\nu}$ are called membership and non-membership values of x_{ij} in A , which maintains the condition $0 \leq a_{ij\mu} + a_{ij\nu} \leq 1$.

For simplicity, we write $A = [x_{ij}, a_{ij}]_{m \times n}$ or simply $[a_{ij}]_{m \times n}$, where $a_{ij} = \langle a_{ij\mu}, a_{ij\nu} \rangle$. In arithmetic operations, only the values of $a_{ij\mu}$ and $a_{ij\nu}$ are needed so from here we only consider the values of $a_{ij} = \langle a_{ij\mu}, a_{ij\nu} \rangle$.

All elements of an IFM are the members of $\langle F \rangle = \{ \langle x, y \rangle : x, y \in [0, 1] \}$ and $0 \leq x + y \leq 1$.

Definition: 1.13

A **submatrix** of A is a matrix formed by selecting from A : a subset of the rows and a subset of the columns and forming a new matrix by using those entries, in the same relative positions, that appear in both the rows and columns of those selected.

Definition: 1.14

An **Intuitionistic fuzzy submatrix** of an intuitionistic fuzzy matrix of order ≥ 1 is obtained by deleting some rows or some columns or both (not necessarily consecutive) or neither.

The intuitionistic fuzzy matrix itself is its intuitionistic fuzzy submatrix.

The maximum number of intuitionistic fuzzy submatrices of an $n \times m$ intuitionistic fuzzy matrix is $(2^n - 1)(2^m - 1)$.

Definition: 1.15

The intuitionistic fuzzy submatrix of order $(n - r)$ obtained by deleting r rows and columns of an n square intuitionistic fuzzy matrix is called **Intuitionistic fuzzy principal submatrix**.

The first order principal intuitionistic fuzzy submatrices obtained from the following third order IFM are

$$\begin{bmatrix} \langle a_{11\mu}, a_{11\nu} \rangle & \langle a_{12\mu}, a_{12\nu} \rangle & \langle a_{13\mu}, a_{13\nu} \rangle \\ \langle a_{21\mu}, a_{21\nu} \rangle & \langle a_{22\mu}, a_{22\nu} \rangle & \langle a_{23\mu}, a_{23\nu} \rangle \\ \langle a_{31\mu}, a_{31\nu} \rangle & \langle a_{32\mu}, a_{32\nu} \rangle & \langle a_{33\mu}, a_{33\nu} \rangle \end{bmatrix}$$

$$[\langle a_{11\mu}, a_{11\nu} \rangle] \quad [\langle a_{12\mu}, a_{12\nu} \rangle] \quad [\langle a_{13\mu}, a_{13\nu} \rangle]$$

Second order intuitionistic fuzzy submatrices are

$$\begin{bmatrix} \langle a_{11\mu}, a_{11\nu} \rangle & \langle a_{12\mu}, a_{12\nu} \rangle \\ \langle a_{21\mu}, a_{21\nu} \rangle & \langle a_{22\mu}, a_{22\nu} \rangle \end{bmatrix}, \begin{bmatrix} \langle a_{22\mu}, a_{22\nu} \rangle & \langle a_{23\mu}, a_{23\nu} \rangle \\ \langle a_{32\mu}, a_{32\nu} \rangle & \langle a_{33\mu}, a_{33\nu} \rangle \end{bmatrix}, \begin{bmatrix} \langle a_{11\mu}, a_{11\nu} \rangle & \langle a_{13\mu}, a_{13\nu} \rangle \\ \langle a_{31\mu}, a_{31\nu} \rangle & \langle a_{33\mu}, a_{33\nu} \rangle \end{bmatrix}$$

Third order intuitionistic fuzzy sub-matrix is the matrix itself.

Definition: 1.16

An $A \in (IF)_{m \times n}$ is said to be **regular**.

If there exists $X \in (IF)_{n \times m}$ satisfying $AXA = A$ and X is called a generalized inverse (g-inverse) of A which is denoted by A^- .

Let A^{-1} be the set of all g-inverse of A .

Definition: 1.17

The blocks along the diagonal of the block intuitionistic fuzzy matrix are called **Diagonal blocks**. The blocks P_{ij} for which $i = j$ are diagonal blocks.

Thus P_{11} and P_{22} diagonal blocks of the block intuitionistic fuzzy matrix

$$A = \begin{bmatrix} P_{11} & P_{12} \\ P_{21} & P_{22} \end{bmatrix}.$$

Comparison between two intuitionistic fuzzy matrices of same order is an important.

Definition: 1.18**Dominance of IFM:**

Let $A, B \in F_{m \times n}$ such that $A = (\langle a_{ij\mu}, a_{ij\nu} \rangle)$ and $B = (\langle b_{ij\mu}, b_{ij\nu} \rangle)$, then $A \leq B$.

If $a_{ij\mu} \leq b_{ij\mu}$ and $a_{ij\nu} \geq b_{ij\nu}$ for all i, j and we say that A is dominated by B or B dominates A .

A and B are said to be comparable, if either $A \leq B$ or $B \leq A$.

Definition: 1.19

Let $A = (\langle a_{ij\mu}, a_{ij\nu} \rangle) \in F_{m \times n}$ and $c = (c_\mu, c_\nu) \in \langle F \rangle$ be a scalar such that $0 \leq c_\mu + c_\nu \leq 1$, then the **scalar multiplication** is defined as

$$cA = (\langle \min\{c_\mu, a_{ij\mu}\}, \max\{c_\nu, a_{ij\nu}\} \rangle) \in F_{m \times n}.$$

Definition: 1.20

Let $A = (\langle a_{ij}, a_{jv} \rangle) \in F_{m \times p}$ and $B = (\langle b_{ij}, b_{jv} \rangle) \in F_{p \times n}$ be two IFMs.

Then the matrix multiplication between A and B is given by

$$AB = \left(\left\langle \max_k \{ \min(a_{ik}, b_{kj}) \}, \min_k \{ \max(a_{ik}, b_{kj}) \} \right\rangle \right)$$

Where $k = 1, 2, \dots, p$, $i = 1, 2, \dots, m$ and $j = 1, 2, \dots, n$.

Definition: 1.21

A intuitionistic fuzzy matrix $A \in F_{m \times n}$ is said to be **regular** if there exists another IFM, $X \in F_{n \times m}$ such that $AXA=A$.

In this case, X is called a **generalized inverse** (g-inverse) of A and it is denoted by A^- . This type of g-inverse is called inner inverse of A .

The inner inverse of an IFM is not unique

The set of all inner inverses is denoted by $A\{1\}$.

For an IFM A of order $m \times n$, an IFM $G \in F_{n \times m}$ is said to be outer inverse of A , if $GAG=G$ and it is denoted by $A\{2\}$.

G is said to be $\{1,2\}$ inverse or semi-inverse of A if $AGA=A$ and $GAG=G$ and it is denoted by $A\{1,2\}$.

The IFM G is said to be $\{1,3\}$ inverse or a least square g-inverse of A if, $AGA=A$ and $(AG)^T=AG$ and it is denoted by $A\{1,3\}$.

Again G is said to be $\{1,4\}$ inverse or a minimum norm g-inverse of A if, $AGA=A$ and $(GA)^T=GA$ and it is denoted by $A\{1,4\}$.

CHAPTER-II

REGULAR BLOCK INTUITIONISTIC FUZZY MATRIX

In this section, we discuss the regularity block intuitionistic fuzzy matrices and also we present several results regarding g-inverse of IFM.

Definition: 2.1

Let X be a block intuitionistic fuzzy matrix of the form

$$X = \begin{bmatrix} A_{p \times q} & B_{p \times (n-q)} \\ C_{(m-p) \times q} & D_{(m-p) \times (n-q)} \end{bmatrix}$$

With the diagonal blocks A and D are regular.

With respect to this partitioning a Schur complement of A in X is an IFM.

Which is denoted by X/A and is defined $\frac{X}{A} = D - CA^{-1}B$.

Where A^{-1} is one of the g-inverses of A .

Similarly, $\frac{X}{D} = A - BD^{-1}C$ is Schur complement of D in X .

X/A is an intuitionistic fuzzy matrix imply, $D + CA^{-1}B = D$.

Definition: 2.2

Let $A = (\langle a_{ij\mu}, a_{ij\nu} \rangle) \in F_{m \times n}$ be an IFM.

Then the element $\langle a_{ij\mu}, a_{ij\nu} \rangle$ is the ij th entry of A .

Let $A_{ia}(A_{aj})$ denote the i th row (j th column) of A .

The row space $R(A)$ of A is the subspace of V_m generated by the rows $\{A_{ia}\}$ of A .

Theorem: 2.1

Let A, B, C be three IFMs such that A is regular, $R(C) \subseteq R(A)$ and $(B) \subseteq C(A)$, then $CA^{-1}B$ is invariant for all choices of g-inverse of A .

Proof:

Since A is regular with $R(C) \subseteq R(A)$ and $C(B) \subseteq C(A)$.

So, $C = CA_2^{-1}A$ and $B = AA_1^{-1}B$.

Where A_2^{-1} is one of the g-inverse of A .

$$\begin{aligned} \text{Now, } CA_1^{-1}B &= (CA_2^{-1}A)A_1^{-1}(AA_2^{-1}B) \\ &= (CA_2^{-1})(AA_1^{-1}A)(A_2^{-1}B) \\ &= C(A_2^{-1}AA_2^{-1})B \\ &= CA_2^{-1}B \end{aligned}$$

Where A_1^{-1} and A_2^{-1} be two different g-inverse of a A .

Thus, $CA^{-1}B$ is invariant for all choice of g-inverse of A .

Example:

$$\text{Let } A = \begin{bmatrix} \langle 0.6, 0.2 \rangle & \langle 0.5, 0.4 \rangle \\ \langle 0.7, 0.3 \rangle & \langle 0.5, 0.4 \rangle \end{bmatrix} \in F_{2 \times 2}.$$

Any g-inverse of A can be written as,

$$\left\{ \begin{array}{l} \left[\begin{array}{cc} \langle a, b \rangle & \langle c, d \rangle \\ \langle e, f \rangle & \langle g, h \rangle \end{array} \right] \text{ where } \begin{array}{l} a \geq 0.8, b \leq 0.2, a + b \leq 1 \\ c \leq 0.6, d \geq 0.4, c + d \leq 1 \\ e \leq 0.5, f \geq 0.5, e + f \leq 1 \\ g \geq 0.7, h \leq 0.3, g + h \leq 1 \end{array} \end{array} \right\}.$$

If we take $B = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.5, 0.5 \rangle \end{bmatrix}$ then $AA^-B = B$ holds for any A^- .

So, $C(B) \subseteq C(A)$.

Again for $C = \begin{bmatrix} \langle 0.6, 0.3 \rangle & \langle 0.7, 0.3 \rangle \\ \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix}$, $CA^-A = C$ for any A^- .

So, $R(C) \subseteq R(A)$.

Now,

$$\begin{aligned} CA^-B &= \begin{bmatrix} \langle 0.6, 0.3 \rangle & \langle 0.7, 0.3 \rangle \\ \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \begin{bmatrix} \langle 0.8, 0.1 \rangle & \langle 0.5, 0.4 \rangle \\ \langle 0.4, 0.5 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix} \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.5, 0.5 \rangle \end{bmatrix} \\ &= \begin{bmatrix} \langle 0.6, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \end{aligned}$$

$$\begin{aligned} CA^-B &= \begin{bmatrix} \langle 0.6, 0.3 \rangle & \langle 0.7, 0.3 \rangle \\ \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \begin{bmatrix} \langle 0.9, 0.1 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.5, 0.5 \rangle & \langle 0.8, 0.2 \rangle \end{bmatrix} \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.5, 0.5 \rangle \end{bmatrix} \\ &= \begin{bmatrix} \langle 0.6, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \end{aligned}$$

For two different A^- of A .

This is true for any generalized inverse of A .

Hence CA^-B is invariant for any g-inverse of A .

Definition: 2.3

A square intuitionistic fuzzy matrix A is said to be idempotent if it satisfy the matrix equation $A^2 = A$.

Theorem: 2.2

Let $A, B \in F_{n \times n}$ and K be the associated permutation matrix of k , then

$$A \leq^T B \Leftrightarrow KA \leq^T KB \Leftrightarrow AK \leq^T BK$$

Proof:

$$A \leq^T B \Leftrightarrow A^T A = A^T B \text{ and } AA^T = BA^T$$

$$\Leftrightarrow A^T KKA = A^T KKB \text{ and } KAA^T K = KBA^T K$$

$$\Leftrightarrow (KA)^T KA = (KA)^T KB \text{ and } KA(KA)^T = KB(KA)^T$$

$$\Leftrightarrow KA \leq^T KB$$

Similarly, $A \leq^T B \Leftrightarrow A^T A = A^T B$ and $AA^T = AA^T = BA^T$

$$\Leftrightarrow KA^T AK = KA^T BK \text{ and } AKKA^T = BKKA^T$$

$$\Leftrightarrow (KA)^T AK = (KA)^T BK \text{ and } AK(AK)^T = BK(AK)^T$$

$$\Leftrightarrow AK \leq^T BK$$

Theorem: 2.3

Let $A, B \in F_{m,n}$ are k -idempotent, then $A \leq^T B$ if and only if $A^2 \leq^T B^2$.

Proof:

Assuming that $A \leq^T B$, then we have

(i) $A^T A = A^T B$ and

(ii) $AA^T = BA^T$

Pre multiplying by K , we have from (i) Partial orderings on k -idempotent fuzzy matrices.

$$KA^TAK = KA^TBK$$

$$KA^TKKAK = KA^TKKBK$$

$$(A^T)^2(A)^2 = (A^T)^2(B)^2 \quad (1)$$

From (ii), $KAA^TK = KBA^TK$

$$KAKKA^TK = KBKKA^TK$$

$$(A)^2(A^T)^2 = (B)^2(A^T)^2 \quad (2)$$

From (1) and (2),

We have, $A^2 \leq^T B^2$

Conversely, if we assume that $A^2 \leq^T B^2$

$$KA^2 \leq^T KB^2$$

$$KA^2K \leq^T KB^2K$$

$$A \leq^T B$$

Definition: 2.3

A matrix $A \in (IF)_n$ is said be **Right k-regular**.

If there exists a matrix $X \in (IF)_n$ such that $A^kXA = A^k$, for some positive integer k.

X is called a Right k-g-inverse of A.

$$\text{Let } A_r\{1^k\} = \left\{ \frac{X}{A^kXA} = A^k \right\} .$$

Definition: 2.4

A matrix $A \in (IF)_n$, is said be **Left k-regular**.

If there exists a matrix $Y \in (IF)_n$ such that $AYA^k = A^k$, for some positive integer k .

Y is called a left k-g-inverse of A .

$$\text{Let } A_l\{1^k\} = \left\{ \frac{Y}{AYA^k} = A^k \right\}.$$

Lemma: 2.1

For $A, B \in (IF)_{m \times n}$, $R(B) \subseteq R(A) \Leftrightarrow B = XA$ for some

$X \in (IF)_m$, $C(B) \subseteq C(A) \Leftrightarrow B = AY$ for some $Y \in (IF)_n$.

Lemma: 2.2

For $A, B \in (IF)_n$, and a positive integer k , then

- (i) If A is right k-regular and $R(B) \subseteq R(A^k)$ then $B = BXA$ for each right k-g-inverse X of A .
- (ii) If A is left k-regular and $C(B) \subseteq C(A^k)$ then $B = AYB$ for each left k-g-inverse Y of A .

Proof:

- (i) Since $R(B) \subseteq R(A^k)$, by Lemma: 2.1

There exists Y such that $B = YA^k$.

By definition of right k-regular, $A^kXA = A^k$.

Hence $B = YA^k$

$$= YA^kXA$$

$$= (YA^k)XA$$

$$= BXA. \text{ Thus (i) holds.}$$

- (ii) This can be proved in the same manner.

Theorem: 2.4

For $A, B, D \in (IF)_n$ and $Y \in A\{1_l^k\}, Z \in B\{1_r\}$.

If the intuitionistic fuzzy matrix equation $A^kXB = D$ is solvable then $AYDZB = D$.

Proof:

Let X be any solution of $A^kXB = D$.

$$\begin{aligned} D &= A^kXB \\ &= AY A^kXBZB \\ &= AY(A^kXB)ZB \\ &= AYDZB. \end{aligned}$$

Hence the proof.

Theorem: 2.5

For $A, B, D \in (IF)_n$ and $Y \in A\{1\}, Z \in B\{1_r^k\}$.

If the intuitionistic fuzzy matrix equation $AXB^k = D$ is solvable then $AYDZB = D$.

Proof:

Let X be any solution of $AXB^k = D$.

$$\begin{aligned} D &= AXB^k \\ &= AYAXB^kZB \\ &= AY(AXB^k)ZB \\ &= AYDZB. \end{aligned}$$

Hence the proof.

Theorem: 2.6

Let $A, B \in (IF)_n$ be a regular IFMs and $D \in (IF)_n$.

Then the intuitionistic fuzzy matrix equation $AXB = D$ is solvable if and only if $AYDZB = D$ for $Y \in A\{1\}$ and $Z \in B\{1\}$.

Proof:

CASE: (i)

A is right k -regular.

By **Lemma: 2.1**, $R(C) = R(A^k) \Rightarrow C = YA^k$ for some $Y \in (IF)_n$ and

$C(B) \subseteq C(A^k) \subseteq C(A) \Rightarrow B = AU$ for some $U \in (IF)_n$.

Since $A \in (IF)_n$ is a right k -regular intuitionistic fuzzy matrix by **Lemma: 2.2**

$R(C) \subseteq R(A^k) \Rightarrow C = CZA$ for each $Z \in \{1_r^k\}$.

Hence for any $X \in A\{1_r^k\}$,

$$\begin{aligned}
 CXB &= (AY^k) X (AU) \\
 &= YA^k XAU \\
 &= Y(A^k XA)U \\
 &= YA^k U \\
 &= CU \\
 &= CZAU \\
 &= CZ(AU) \\
 &= CZB.
 \end{aligned}$$

Thus $CXB = CZB$ for all $X, Z \in A\{1_r^k\}$.

CASE: (ii)

A is left k-regular.

By **Lemma: 2.1**, $R(C) \subseteq R(A^k) \subseteq R(A) \Rightarrow C = YA$ for some $Y \in (IF)_n$ and $C(B) \subseteq C(A^k) \Rightarrow B = A^kU$ for some $U \in (IF)_n$.

Since $A \in (IF)_n$ is a left k-regular intuitionistic fuzzy matrix, by **Lemma: 2.2**

$C(B) = C(A^k) \Rightarrow B = AZB$ for each $Z \in A\{1_l^k\}$.

Hence for any $X \in A\{1_l^k\}$,

$$\begin{aligned} CXB &= (YA)X(A^kU) \\ &= Y(AXA^k)U \\ &= YA^kU \\ &= YB \\ &= Y(AZB) \\ &= (YA)(ZB) \\ &= CZB. \end{aligned}$$

Thus $CXB = CZB$ for all $X, Z \in A\{1_l^k\}$.

CASE: (iii)

A is both right and left k-regular.

By **Lemma: 2.1**, $R(C) \subseteq R(A^k) \Rightarrow C = YA^k$ for some $Y \in (IF)_n$.

Since $A \in (IF)_n$ is a left k-regular intuitionistic fuzzy matrix, by **Lemma: 2.2**

$C(B) \subseteq C(A^k) \Rightarrow B = AZB$ for each $Z \in A\{1_l^k\}$.

Since $A \in (IF)_n$ is a right k -regular intuitionistic fuzzy matrix.

For any $X \in A\{1_r^k\}$,

$$\begin{aligned} CXB &= (YA^k)X(AZB) \\ &= Y(A^kXA)ZB \\ &= YA^kZB \\ &= CZB. \end{aligned}$$

Thus $CXB = CZB$ for all $X \in A\{1_r^k\}$ and $Z \in A\{1_l^k\}$.

Thus CXB is invariant for all choices of k -g-inverses of A .

Theorem: 2.7

Let $M = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$ with A and D are right k -regular intuitionistic fuzzy matrices, M/A and M/D are exists.

$$R(C) \subseteq R(A^k) \text{ and } R(B) \subseteq R(D^k).$$

If $xM = b$ is solvable then $yA = c$ and $zD = d$ are solvable.

$$\text{Where } b = \begin{pmatrix} c & d \end{pmatrix}, C \geq dD^{-1}C \text{ and } d \geq cA^{-1}B.$$

Proof:

Since $xM = b$ is solvable.

Let $x = \begin{pmatrix} \beta & \gamma \end{pmatrix}$ is a solution.

$$\text{Then, } \begin{pmatrix} \beta & \gamma \end{pmatrix} \begin{bmatrix} A & B \\ C & D \end{bmatrix} = \begin{pmatrix} c & d \end{pmatrix}$$

$$\Rightarrow (\beta A + \gamma C \quad \beta B + \gamma D) = \begin{pmatrix} c & d \end{pmatrix}$$

Hence we get the equations,

$$\beta A + \gamma C = c \text{ and } \beta B + \gamma D = d. \tag{1}$$

By Lemma: 2.2

A is right k-regular intuitionistic fuzzy matrices, $R(C) \subseteq R(A^k) \Rightarrow C = CA^-A$ for each right k-g-inverse of A^- of A.

And D is right k-regular intuitionistic fuzzy matrix, $R(B) \subseteq R(D^k) \Rightarrow B = BD^-D$ for each right k-g-inverse D^- of D.

Substituting C and B in Equation (1),

We get the equations,

$$(\beta + \beta\gamma CA^-)A = c \text{ and } (\beta BD^- + \gamma)D = d.$$

Thus $yA = c$ and $zD = d$ are solvable.

Since A and D are right k-regular intuitionistic fuzzy matrices, the solutions will be of the form $y = cA^-$ and $z = dD^-$.

$$\text{Hence, } CA^- = \beta + \gamma CA^- \text{ and } dD^- = \beta BD^- + \gamma.$$

$$cA^-B = \beta B + \gamma CA^-B \text{ and } dD^-C = \beta BD^-C + \gamma C \quad (2)$$

Since M/A and M/D exist then $A + BD^-C = A$ and $D + CA^-B = D$.

Substituting for A and D in (1) using (2).

We get,

$$\begin{aligned} c &= \beta A + \gamma C \\ &= \beta A + \beta BD^-C + \gamma C \\ &= \beta A + dD^-C \\ d &= \beta B + \gamma D \\ &= \beta B + \gamma D + \gamma CA^-B \\ &= \gamma D + cA^-B. \end{aligned}$$

By intuitionistic fuzzy addition it follows that $c \geq dD^-C$ and $d \geq cA^-B$.

Theorem: 2.8

Let $M = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$ with A and D are right k-regular IFMs.

If $yA^k = c$ and $zD^k = d$ are solvable, $c \geq dD^{-}C^k$ and $d \geq cA^{-}B^k$ then $xM^k = b$ is solvable. Where $M^k = \begin{bmatrix} A^k & B^k \\ C^k & D^k \end{bmatrix}$, $x = \begin{pmatrix} y & z \end{pmatrix}$ and $b = \begin{pmatrix} c & d \end{pmatrix}$.

Proof:

Since $yA^k = c$ and $zD^k = d$ are solvable.

Let $y = cA^{-}$ and $z = dD^{-}$ are the solutions.

$$\Rightarrow cA^{-}A^k = c \text{ and } dD^{-}D^k = d.$$

From the given conditions, $c \geq dD^{-}C^k$ and $d \geq cA^{-}B^k$.

We get, $c = c + dD^{-}C^k$ and $d = d + cA^{-}B^k$.

$$\begin{aligned} \text{Now, } (cA^{-} \quad dD) \begin{bmatrix} A^k & B^k \\ C^k & D^k \end{bmatrix} &= (cA^{-}A^k + dD^{-}C^k \quad cA^{-}B^k + dD^{-}D^k) \\ &= (c + dD^{-}C^k \quad cA^{-}B^k + d) \\ &= (c \quad d) \\ &= b \end{aligned}$$

Thus $xM^k = b$ is solvable.

Theorem: 2.9

Let $M = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$ with A and D are left k-regular IFMs.

If $A^k y = b$ and $D^k z = c$ are solvable, $c \geq C^k A^{-} b$ and $b \geq B^k D^{-} c$ then $M^k x = d$ is

solvable where $M^k = \begin{bmatrix} A^k & B^k \\ C^k & D^k \end{bmatrix}$, $x = \begin{pmatrix} y \\ z \end{pmatrix}$ and $d = \begin{pmatrix} b \\ c \end{pmatrix}$.

Proof:

Since $A^k y = b$ and $D^k z = c$ are solvable.

Let $y = A^- b$ and $D^k z = c$ are the solution.

$$\Rightarrow A^k A^- b = b; D^k D^- c = c.$$

From the given conditions, $c \geq C^k A^- b$ and $b \geq B^k D^- c$.

We get, $c = c + C^k A^- b$ and

$$b = b + B^k D^- c.$$

$$\text{Now, } \begin{bmatrix} A^k & B^k \\ C^k & D^k \end{bmatrix} \begin{pmatrix} A^- b \\ D^- c \end{pmatrix} = \begin{pmatrix} A^k A^- b + B^k D^- c \\ C^k A^- b + D^k D^- c \end{pmatrix}$$

$$= \begin{pmatrix} b + B^k D^- c \\ C^k A^- b + c \end{pmatrix}$$

$$= \begin{pmatrix} b \\ c \end{pmatrix}$$

$$= d$$

Thus $M^k x = d$ is solvable.

Hence the proof.

Theorem: 2.10

Let X be a BIFM of the form $X = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$ with $R(C) \subseteq R(A)$, $C(B) \subseteq C(A)$, $R(B) \subseteq R(D)$, $C(C) \subseteq C(D)$ such that A, B, C are idempotent, $A \geq B$ and $D \geq CA^- B$.

Then X is regular and has a g-inverse $X^- = \begin{bmatrix} A^- + A^- B D^- C A^- & A^- B D^- \\ D^- C A^- & D^- \end{bmatrix}$ for some A^- of A and D^- of D .

Proof:

Since A is idempotent with $R(C) \subseteq R(A)$ and $C(B) \subseteq C(A)$, then $C = CA^{-}A$ and $B = AA^{-}B$.

Since $D \geq CA^{-}B$ it follows that $D = D + CA^{-}B$.

Hence, X can be expressed as $X = PQR$,

$$\text{Where } P = \begin{bmatrix} I & O \\ CA^{-} & I \end{bmatrix},$$

$$Q = \begin{bmatrix} A & O \\ O & D \end{bmatrix} \text{ and}$$

$$R = \begin{bmatrix} I & A^{-}B \\ O & I \end{bmatrix}.$$

It can be shown that P and R both are idempotent.

$$\text{Now, } RQ^{-}P = \begin{bmatrix} I & A^{-}B \\ O & I \end{bmatrix} \begin{bmatrix} A^{-} & O \\ O & D^{-} \end{bmatrix} \begin{bmatrix} I & O \\ CA^{-} & I \end{bmatrix}$$

$$= \begin{bmatrix} A^{-} + A^{-}BD^{-}CA^{-} & A^{-}BD^{-} \\ D^{-}CA^{-} & D^{-} \end{bmatrix}$$

$$= X^{-} \text{ (say).}$$

$$\text{Now, } XX^{-}X = (PQR)(RQ^{-}P)(PQR)$$

$$= (PQR)Q^{-}(PQR)$$

$$= \begin{bmatrix} A + BD^{-}C & B + BD^{-}D \\ C + DD^{-}C & D + CA^{-}B \end{bmatrix}.$$

Since, M/D is Schur complement in X and it is an IFM.

So, $A + BD^{-1}C = A$.

As, $R(B) \subseteq R(D)$ and $C(C) \subseteq C(D)$ implies $B = BD^{-1}D$ and $C = DD^{-1}C$.

$$\text{Hence } XX^{-1}X = \begin{bmatrix} A & B \\ C & D \end{bmatrix} = X.$$

Thus X is regular and the $IFMX^{-1}$ is a g -inverse of X .

Example:

Let us consider the BIFM

$$X = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle & \vdots & \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.7, 0.3 \rangle & \vdots & \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \\ \dots & \dots & \vdots & \dots & \dots \\ \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle & \vdots & \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle & \vdots & \langle 0.7, 0.2 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix} = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$$

One of the g -inverse of A is $A^{-1} = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.5, 0.5 \rangle \\ \langle 0.5, 0.5 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix}$ that one for

$$D \text{ is } D^{-1} = \begin{bmatrix} \langle 0.8, 0.1 \rangle & \langle 0.5, 0.4 \rangle \\ \langle 0.6, 0.3 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix}$$

Now, $CA^{-1}B = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix}$ and $D \geq CA^{-1}B$.

Again, $BD^{-1}D = \begin{bmatrix} \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.3 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} = B$ implies, $R(C) \subseteq R(D)$ and

$$DD^{-1}C = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle \end{bmatrix} = C \text{ implies, } C(B) \subseteq C(D).$$

Now, $A^{-1}BD^{-1} = \begin{bmatrix} \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix}$ and

$$D^{-}CA^{-} = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle \end{bmatrix}.$$

$$\text{Then, } A^{-}BD^{-}CA^{-} = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \text{ and}$$

$$A^{-} + A^{-}BD^{-}CA^{-} = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix}$$

$$\text{So, } X^{-} = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle & \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle & \langle 0.8, 0.1 \rangle & \langle 0.5, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle & \langle 0.6, 0.3 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix} \text{ and } XX^{-}X = X.$$

Corollary:

For the BIFM X of the form as stated in Theorem: 2.2, if A is symmetric and idempotent, then the semi-inverse that is $A\{1,2\}$ type g-inverse of A exists.

Then under the condition $A \geq BD^{-}C$,

We get $A^{-} = A^{-}AA^{-} \geq A^{-}BD^{-}CA^{-}$.

This follows that $A^{-} + A^{-}BD^{-}CA^{-} = A^{-}$.

Then the g-inverse of X reduces to $X^{-} = \begin{bmatrix} A^{-} & A^{-}BD^{-} \\ D^{-}CA^{-} & D^{-} \end{bmatrix}$.

Example:

Let us consider the BIFM

$$X = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle & \vdots & \langle 0.8, 0.2 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.7, 0.3 \rangle & \vdots & \langle 0.6, 0.4 \rangle \\ \dots & \dots & \vdots & \dots \\ \langle 0.6, 0.4 \rangle & \langle 0.7, 0.3 \rangle & \vdots & \langle 0.6, 0.4 \rangle \end{bmatrix} = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$$

Here as A is symmetric and idempotent so A itself an $A\{1,2\}$ inverse.

Now, $CA^{-1}B = [\langle 0.6, 0.4 \rangle]$.

And hence, $D \geq CA^{-1}B$.

For $D^{-1} = [\langle 0.6, 0.4 \rangle]$,

$$BD^{-1}C = \begin{bmatrix} \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \text{ and then, } A \geq BD^{-1}C.$$

Again, $A^{-1}BD^{-1} = [\langle 0.6, 0.4 \rangle \langle 0.6, 0.4 \rangle]^T$ and

$$D^{-1}CA^{-1} = [\langle 0.6, 0.4 \rangle \langle 0.6, 0.4 \rangle]$$

So the g-inverse will be $X^{-1} = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix}$ and for that $XX^{-1}X = X$

holds.

Theorem: 2.11

Let $X = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$ be a BIFM with

$$R(C) \subseteq R(A), C(B) \subseteq C(A), R(B) \subseteq R(D) \text{ and } C(C) \subseteq C(D).$$

If X is regular then A and D are regular.

Proof:

Let X be regular and $X^{-1} = \begin{bmatrix} P & Q \\ R & S \end{bmatrix}$ be a g-inverse of X .

$$\text{Hence } XX^{-1}X = X.$$

By comparing the corresponding diagonal blocks we get,

$$APA + BRA + AQC + BSC = A$$

$$CPB + DRB + CQD + DSD = D \quad (1)$$

By the given conditions on X,

We have $C = UA$, $B = AV$, $C = DU_1$ and $B = V_1D$ for some intuitionistic fuzzy matrices U , V , U_1 and V_1 .

Substituting $B = AV$ and $C = UA$ in (1).

$$\text{We get, } A(P + VR + QU + VSU)A = A.$$

Hence, A is regular.

Similarly, substituting $B = V_1D$ and $C = DU_1$ in (2).

$$\text{We get, } D(V_1PU_1 + V_1R + QU_1 + S)D = D.$$

Hence, D is regular.

Remark:

The converse of the above theorem is not true in general.

This is illustrated in the following example.

Example:

Let us consider the BIFM

$$X = \begin{bmatrix} \langle 0.5, 0.4 \rangle & \vdots & \langle 0.6, 0.3 \rangle & \langle 0.7, 0.3 \rangle \\ \dots & \vdots & \dots & \dots \\ \langle 0.8, 0.1 \rangle & \vdots & \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \vdots & \langle 0.6, 0.4 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix} = \begin{bmatrix} A & B \\ C & D \end{bmatrix}.$$

Here A and D are regular.

One of the g-inverse A and D are respectively

$$A^- = [\langle 0.6, 0.3 \rangle] \text{ and}$$

$$D^- = \begin{bmatrix} \langle 0.9, 0.1 \rangle & \langle 0.5, 0.5 \rangle \\ \langle 0.5, 0.5 \rangle & \langle 0.8, 0.2 \rangle \end{bmatrix}.$$

But $X^2 \neq X$ that is, X is not idempotent.

So, X is not regular.

Theorem: 2.12

For the IFMs A, B, C of order $m \times n$ the following statements hold:

- (i) If $R(C) \subseteq R(A)$, then A is regular $\Leftrightarrow [AC]^T$ is regular.
- (ii) If $C(B) \subseteq C(A)$, then A is regular $\Leftrightarrow [AB]$ is regular.

Proof:

Since $R(C) \subseteq R(A)$ and A is regular implies $C = CA^-A$.

Now, we can verify that $[A^-O]$ is a g-inverse of $[AC]^T$.

Hence, $[AC]^T$ is regular.

Conversely, if $X = [AC]^T$ is regular, then $R(C) \subseteq R(A)$ implies that there exists IFM Y of order m such that $C = YA$.

$$\text{Hence, } X = [IY]^T A$$

$$= UA$$

$$\text{Where, } U = [IY]^T.$$

For $U^- = [IO], U^-U = I$ and U^- is a g-inverse of U .

Thus U is regular.

Now, $X = UA$ is regular implies, $(UA)X^-(UA) = UA$.

Premultiplying with U^- on both sides,

We get $A(X^{-1}U)A = A$.

Thus A is regular.

In similar way we can prove the statement in (ii).

Example:

Let $A = [\langle 0.8, 0.2 \rangle \quad \langle 0.5, 0.5 \rangle]$ and $C = [\langle 0.5, 0.5 \rangle \quad \langle 0.5, 0.5 \rangle]$ be two IFMs of order (1×2) .

Here $R(C) \subseteq R(A)$ holds and A is regular, one of its g-inverse is $[\langle 0.9, 0.1 \rangle \langle 0.5, 0.4 \rangle]^T$.

Now, $[AC]^T = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.5, 0.5 \rangle \\ \langle 0.5, 0.5 \rangle & \langle 0.5, 0.5 \rangle \end{bmatrix}$ is idempotent IFM.

So, $[AC]^T$ is regular.

Similarly, we can show that $[AB]$ is also regular for any IFM B of order (1×2) with $(B) \subseteq C(A)$.

CHAPTER-III

LU-DECOMPOSITION OF BLOCK INTUITIONISTIC FUZZY MATRIX

In this section, we shall derive the conditions for a block intuitionistic fuzzy matrix to be expressed as the product of an idempotent lower block triangular intuitionistic fuzzy matrix and an idempotent upper block triangular intuitionistic fuzzy matrix.

Lemma: 3.1

Let $X = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$ be an BIFM with diagonal blocks A and D are non-zero idempotents. Then the following equivalence holds:

- (i) D and $C(C) \subseteq C(D)$.
- (ii) $AB + BD = B \Leftrightarrow AB = BD = B \Leftrightarrow R(B) \subseteq R(D)$ and $C(B) \subseteq C(A)$.

Proof:

Since A and D are non-zero idempotents, A itself is a g-inverse of A.

Hence $A \in A\{1\}$ and $D \in D\{1\}$.

As A and D are regular so, $CA = DC = C \Leftrightarrow R(C)R \subseteq R(A)$ and $C(C) \subseteq C(D)$.

Again, $CA = DC = C$

$$\Rightarrow CA + DC = C$$

Conversely, suppose $CA + DC = C$, then $C \geq CA$ and $C \geq DC$.

Let us claim that $C = CA$, for $C > CA$, then $CA > CA^2 = CA$ is not possible.

Similarly, if D is idempotent, we claim that $C = DC$.

Hence $CA + DC = C$.

$$\Rightarrow CA = DC = C.$$

Thus the equivalence in (i) holds.

The equivalence of (ii) can be proved in the same way.

Example:

Let the blocks of the BIFM X are respectively,

$$A = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.7, 0.3 \rangle \end{bmatrix}$$

$$B = \begin{bmatrix} \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix}$$

$$C = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle \end{bmatrix} \text{ and}$$

$$D = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix}.$$

$$\text{Then, } CA = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle \end{bmatrix} \text{ and}$$

$$DC = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle \end{bmatrix}.$$

Thus $CA = DC = C$ and

$$CA + DC = C.$$

Again, $AB = \begin{bmatrix} \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix}$ and

$$BD = \begin{bmatrix} \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix}.$$

Thus, $AB = BD = B$ and $AB + BD = B$.

As, $CA^-A = C$ for any g-inverse A^- of A imply $R(C) \subseteq R(A)$ and $DD^-C = C$ for any g-inverse D^- of D imply $C(C) \subseteq C(D)$.

Lemma: 3.2

Let us consider the BIFM $X = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$ with diagonal blocks A and D are non-zero idempotent. Then,

- (i) X/A is an intuitionistic fuzzy matrix $\Leftrightarrow D \geq CAB$.
- (ii) X/D is an intuitionistic fuzzy matrix $\Leftrightarrow A \geq BDC$.

Proof:

- (i) From the definition of Schur complement, X/A is an IFM imply $D \geq CA^-B$.

Again, A is an idempotent IFM so A itself a g-inverse.

i.e., $A^- = A$.

Hence, $D \geq CAB$.

- (ii) Similarly, from the definition of Schur complement, X/A is an IFM imply $A \geq BD^-C$.

As, D is an idempotent IFM so D itself a g-inverse.

i.e., $D^- = D$.

Hence, $A \geq BDC$.

Example:

If we take the same BIFM as in the above example, then

$$CAB = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \text{ and } D \geq CAB \text{ holds.}$$

$$\text{Similarly, } BDC = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \text{ and } A \geq BDC.$$

Theorem: 3.3

Let us consider the BIFM $X = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$ with the diagonal blocks A and D are non-zero idempotent. Then $A \geq BC$, $D \geq CB$, $CA = DC = C$ and $AB = BD = B$ holds if and only if X is idempotent.

Proof:

Let $A \geq BC$, $D \geq CB$, $CA = DC = C$ and $AB = BD = B$ holds.

$$\begin{aligned} \text{Then, } A + B &= [\max\{a_{ij\mu}, bc_{ij\mu}\}, \min\{a_{ij\nu}, bc_{ij\nu}\}] \\ &= [a_{ij\mu}, a_{ij\nu}] \\ &= A. \end{aligned}$$

Similarly, $D \geq CB$ implies, $D + CB = D$.

Again by Lemma: 3.1

$CA = DC = C$ implies, $CA + DC = C$ and $AB = BD = B$ implies, $AB + BD = B$.

$$\begin{aligned} \text{Now, } X^2 &= \begin{bmatrix} A^2 + BC & AB + BD \\ CA + DC & CB + D^2 \end{bmatrix} \\ &= \begin{bmatrix} A + BC & AB + BD \\ CA + DC & CB + D \end{bmatrix} \end{aligned}$$

$$= \begin{bmatrix} A & B \\ C & D \end{bmatrix}$$

$$= X$$

(As, A,D are idempotent and using the above deduction.)

Conversely, let X is idempotent.

Then equating the corresponding blocks in $X^2 = X$.

We get, $A + BC = A$, $CB + D = D$, $AB + BD = B$ and $CA + DC = C$.

Now, $A + BC = A$ implies, $A \geq BC$ and $CB + D = D$ implies, $D \geq CB$.

Again, $AB + BD = B$ implies, $AB = BD = B$ and $CA + DC = C$ implies, $CA = DC = C$.

Hence the conditions.

The conditions on X with A and D to be non-zero idempotents are essential here.

This is illustrated by the following example.

Let us consider the BIFM $X = \begin{bmatrix} \langle 0,1 \rangle & \langle 1,0 \rangle & \langle 1,0 \rangle \\ \langle 0,1 \rangle & \langle 0,1 \rangle & \langle 0,1 \rangle \\ \langle 0,1 \rangle & \langle 1,0 \rangle & \langle 1,0 \rangle \end{bmatrix}$

$$= \begin{bmatrix} A & B \\ C & D \end{bmatrix} \text{ with}$$

$$A = \begin{bmatrix} \langle 0,1 \rangle & \langle 1,0 \rangle \\ \langle 0,1 \rangle & \langle 0,1 \rangle \end{bmatrix},$$

$$B = [\langle 1,0 \rangle \quad \langle 0,1 \rangle]^T,$$

$$C = [\langle 0,1 \rangle \quad \langle 1,0 \rangle] \text{ and}$$

$$D = [\langle 1,0 \rangle].$$

Here X is idempotent with A is not idempotent but D is idempotent.

Then $D \geq CB$, $A = BC$, $BD = B$ and $DC = C$. But $CA \neq C$ and $AB \neq B$.

Theorem: 3.4

Let $X = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$, $X_1 = \begin{bmatrix} A & O \\ C & D \end{bmatrix}$ and $X_2 = \begin{bmatrix} A & B \\ O & D \end{bmatrix}$ be three BIFMs, then the following are equivalent.

- (i) $X = X_1 X_2 = X_2 X_1$ with both X_1 and X_2 are idempotents.
- (ii) A and D are idempotents;
 $A \geq BC$, $D \geq CB$, $CA = DC = C$ and $AB = BD = B$.

Proof:

(i) \Rightarrow (ii)

Here X_1 is idempotent.

$$\text{i.e.}, X_1^2 = \begin{bmatrix} A^2 & O \\ CA + DC & D^2 \end{bmatrix} = X_1.$$

Equating the corresponding blocks.

We get $A^2 = A$, $D^2 = D$ and $CA + DC = C$.

That is, A and D are idempotents with $CA + DC = C$.

Similarly, X_2 is idempotent imply, A and D are idempotents with $AB + BD = B$.

Then using **Lemma: 3.1**, this reduces to $CA = DC = C$ and $AB = BD = B$.

$$\text{Again, } X^2 = X_1 X_2 X_1 X_2$$

$$= X_1 X_2 X_2 X_1$$

$$= X_1 X_2 X_1$$

$$= X_1 X_1 X_2$$

$$= X_1 X_2$$

$$= X.$$

So, X is idempotent.

$$\text{i.e.}, X^2 = \begin{bmatrix} A+BC & AB+BD \\ CA+DC & CB+D \end{bmatrix} = X.$$

Equating the diagonal blocks.

We get, $A + BC = A$ and $CB + D = D$.

Which gives, $A \geq BC$ and $D \geq CB$.

Hence $X_1 X_2 = X = X_2 X_1$ with X_1, X_2 idempotents give, A and D are idempotents, $CA = DC = C$, $AB = BD = B$, $A \geq BC$ and $D \geq CB$.

(ii) \Rightarrow (i)

A and D idempotents with, $CA = DC = C$ and $AB = BD = B$.

Shows that X_1 and X_2 are idempotents.

Again, $A \geq BC$ and $D \geq CB$ gives, X is idempotent.

So, $X = X_1 X_2 = X_2 X_1$.

Example:

Let us consider the BIFMs

$$X = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle & \vdots & \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \dots & \vdots & \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \\ \dots & \dots & \vdots & \dots & \dots \\ \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle & \vdots & \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle & \vdots & \langle 0.7, 0.2 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix} = \begin{bmatrix} A & B \\ C & D \end{bmatrix}.$$

$$X_1 = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle & \vdots & \langle 0, 1 \rangle & \langle 0, 1 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.7, 0.3 \rangle & \vdots & \langle 0, 1 \rangle & \langle 0, 1 \rangle \\ \dots & \dots & \vdots & \dots & \dots \\ \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle & \vdots & \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle & \vdots & \langle 0.7, 0.2 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix} \text{ and}$$

$$X_2 = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle & \vdots & \dots & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \dots & \vdots & \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \\ \dots & \dots & \vdots & \dots & \dots \\ \langle 0, 1 \rangle & \langle 0, 1 \rangle & \vdots & \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0, 1 \rangle & \langle 0, 1 \rangle & \vdots & \langle 0.7, 0.2 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix}$$

Here both X_1 and X_2 are idempotents.

$$\text{Now, } X_1 X_2 = \begin{bmatrix} \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle & \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle & \langle 0.8, 0.2 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.3 \rangle & \langle 0.7, 0.2 \rangle & \langle 0.7, 0.2 \rangle \end{bmatrix} = X = X_2 X_1.$$

$$\text{Also, } BC = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.6, 0.4 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \text{ so, } A \geq BC.$$

$$\text{And } CB = \begin{bmatrix} \langle 0.7, 0.3 \rangle & \langle 0.6, 0.4 \rangle \\ \langle 0.7, 0.2 \rangle & \langle 0.6, 0.4 \rangle \end{bmatrix} \text{ so, } D \geq CB.$$

Corollary:

Let the BIFM $X = \begin{bmatrix} A & B \\ C & D \end{bmatrix}$ with the diagonal blocks A and D are non-zero

idempotents. Then the following are equivalent:

- (i) X is idempotent.
- (ii) X has a commuting idempotent LU-decomposition.

Proof:

(i) \Rightarrow (ii)

X is idempotent implies, $A + BC = A$ and $CB + D = D$.

Which gives, $A \geq BC$, $CA = DC = C$, $AB = BD = B$ and $D \geq CB$. (by Lemma: 3.1).

$$\text{Let } X_1 = \begin{bmatrix} A & O \\ C & D \end{bmatrix} \text{ and}$$

$$X_2 = \begin{bmatrix} A & B \\ O & D \end{bmatrix}.$$

$$\text{Then, } X_1^2 = \begin{bmatrix} A^2 & O \\ CA+DC & D^2 \end{bmatrix}$$

$$= \begin{bmatrix} A & O \\ C & D \end{bmatrix}$$

$$= X_1.$$

$$\text{Similarly, } X_2^2 = \begin{bmatrix} A^2 & AB+BD \\ O & D^2 \end{bmatrix}$$

$$= \begin{bmatrix} A & B \\ O & D \end{bmatrix}$$

$$= X_2.$$

$$\text{Now, } X_1 X_2 = X = X_2 X_1.$$

(ii) \Rightarrow (i)

$$X^2 = (X_1 X_2)^2$$

$$= (X_2 X_1)^2$$

$$= X_2^2 X_1^2$$

$$= X_2 X_1$$

$$= X.$$

Hence X is idempotent.

CONCLUSIONS

Here we derived the generalized inverse of some special type of BIFMs whose blocks satisfy some conditions. Namely, we considered the blocks of the BIFMs to be idempotents and the diagonal blocks to be non-zero regular. In our future work we shall try to generalize the method of finding the g-inverse of any Block Intuitionistic Fuzzy Matrices.

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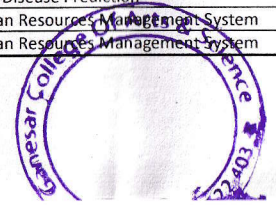
GANESAR COLLEGE OF ARTS AND SCIENCE, MELASIVAPURI

DEPARTMENT OF COMPUTER SCIENCE

STUDENTS UNDERTAKING PROJECTS (Group Project) -APRIL 2022

S. No	Reg.No	Student Name	Name of the mentor	sub.code	Specify Projectwork/ field work	Title of the project/Field work	Place of work done	Duration
1	CB19S191606	M.KANAGARAJA	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Techno Task Manager	Ganesar College of Arts & Science	6 Months
2	CB19S191637	P.TAMILSELVAN	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Techno Task Manager	Ganesar College of Arts & Science	6 Months
3	CB19S191629	P.SARANYA	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Defenses Against Online Password Guessing Attacks By Using Persuasive Click Points	Ganesar College of Arts & Science	6 Months
4	CB19S191640	V.VARSHARANI	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Defenses Against Online Password Guessing Attacks By Using Persuasive Click Points	Ganesar College of Arts & Science	6 Months
5	CB19S191592	A.ARTHI	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Taxation Information System	Ganesar College of Arts & Science	6 Months
6	CB19S191594	K.BANUMATHI	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Taxation Information System	Ganesar College of Arts & Science	6 Months
7	CB19S191610	T.LOGAMMAL	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Online Bug Tracking System	Ganesar College of Arts & Science	6 Months
8	CB19S191641	C.VELLAIYAMMAL	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Online Bug Tracking System	Ganesar College of Arts & Science	6 Months
9	CB19S191593	A.AZHAGU	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Spiritual Tourism	Ganesar College of Arts & Science	6 Months
10	CB19S191642	N.YUVARAJ	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Spiritual Tourism	Ganesar College of Arts & Science	6 Months
11	CB19S191627	M.RAJESHWARI	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	First Round	Ganesar College of Arts & Science	6 Months
12	CB19S191631	M.SNEKA	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	First Round	Ganesar College of Arts & Science	6 Months
13	CB19S191603	A.JOTHIKA	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Smart Construction Plus	Ganesar College of Arts & Science	6 Months
14	CB19S191623	K.PRIYADHARSHINI	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Smart Construction Plus	Ganesar College of Arts & Science	6 Months
15	CB19S191595	K.DHARANI	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Ensuring Distributed Accountability For Data Sharing In The Cloud	Ganesar College of Arts & Science	6 Months
16	CB19S191600	P.DURGA	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Ensuring Distributed Accountability For Data Sharing In The Cloud	Ganesar College of Arts & Science	6 Months
17	CB19S191607	A.KARTHIKA	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Software License Monitoring system	Ganesar College of Arts & Science	6 Months
18	CB19S191617	R.MURUGESHWARI	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Software License Monitoring system	Ganesar College of Arts & Science	6 Months
19	CB19S191595	N.BHARATHIDASAN	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Employee Tracker System	Ganesar College of Arts & Science	6 Months
20	CB19S191634	A.SURYA	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Employee Tracker System	Ganesar College of Arts & Science	6 Months
21	CB19S191587	R.ADHIPAN	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Fruit Billing Software	Ganesar College of Arts & Science	6 Months
22	CB19S191615	A.MURUGANANTHAM	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Fruit Billing Software	Ganesar College of Arts & Science	6 Months
23	CB19S191586	J.ABINAYA	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Secure Data Deduplication With Access Control Management in cloud Storage	Ganesar College of Arts & Science	6 Months
24	CB19S191598	R.DINESH	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Online Call Logging And Customer Support System	Ganesar College of Arts & Science	6 Months
25	CB19S191608	P.KARUPPIAH	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Online Call Logging And Customer Support System	Ganesar College of Arts & Science	6 Months
26	CB19S191605	SP.KALYANI	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Optimized K-Means Algorithm and Application In CRM System	Ganesar College of Arts & Science	6 Months
27	CB19S191619	A.NANDHINI	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Optimized K-Means Algorithm and Application In CRM System	Ganesar College of Arts & Science	6 Months
28	CB19S191601	S.GOKULAKRISHNAN	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Secure And Efficient Ranking Based Trust Prediction In Alibaba E-Commerce Web	Ganesar College of Arts & Science	6 Months
29	CB19S191626	K.RAJAPANDIYAN	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Secure And Efficient Ranking Based Trust Prediction In Alibaba E-Commerce Web	Ganesar College of Arts & Science	6 Months
30	CB19S191604	K.KALAIYARASI	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Geospatial Infotech Solution	Ganesar College of Arts & Science	6 Months
31	CB19S191620	M.NANDHINI	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Geospatial Infotech Solution	Ganesar College of Arts & Science	6 Months
32	CB19S191621	S.NIVETHA	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Walk Around Concealed Building for Internal floor Plan Structure	Ganesar College of Arts & Science	6 Months
33	CB19S191628	V.RENUKA	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Walk Around Concealed Building for Internal floor Plan Structure	Ganesar College of Arts & Science	6 Months
34	CB19S191590	P.ANBUSELVAM	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Online Car Auction Site	Ganesar College of Arts & Science	6 Months
35	CB19S191624	T.RAHUL	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Online Car Auction Site	Ganesar College of Arts & Science	6 Months
36	CB19S191589	S.AJITHKUMAR	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Smart City In Pudukkottai	Ganesar College of Arts & Science	6 Months
37	CB19S191591	A.ARAVINDHSAMY	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Smart City In Pudukkottai	Ganesar College of Arts & Science	6 Months
38	CB19S191602	B.INBATAMILAN	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	India Mapping Solutions	Ganesar College of Arts & Science	6 Months
39	CB19S191638	P.THINAKARAN	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	India Mapping Solutions	Ganesar College of Arts & Science	6 Months
40	CB19S191611	M.LOGESH	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Student And Staff Interaction Software	Ganesar College of Arts & Science	6 Months
41	CB19S191630	K.SHANMUGANATHAN	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Student And Staff Interaction Software	Ganesar College of Arts & Science	6 Months
42	CB19S191633	R.SUMITHASRI	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Secure Data Sharing In Cloud Computing Using Revocable-Storage Identity-Based Encryption	Ganesar College of Arts & Science	6 Months
43	CB19S191644	G.KAVITHA	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Secure Data Sharing In Cloud Computing Using Revocable-Storage Identity-Based Encryption	Ganesar College of Arts & Science	6 Months
44	CB19S191632	S.SRIKA	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Privacy-Preserving Public Auditing For Data Storage Security In Cloud Computing	Ganesar College of Arts & Science	6 Months
45	CB19S191635	S.SUDHABHARATHI	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Privacy-Preserving Public Auditing For Data Storage Security In Cloud Computing	Ganesar College of Arts & Science	6 Months
46	CB19S191618	S.MUTHUSELVI	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Secure Distributed Deduplication System With Improved Reliability	Ganesar College of Arts & Science	6 Months
47	CB19S191636	M.SUWETHA	Miss R.RAJA	16SMBECPSPW	PROJECTWORK	Secure Distributed Deduplication System With Improved Reliability	Ganesar College of Arts & Science	6 Months
48	CB19S191643	N.DURGALAKSHMI	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Plant Disease Prediction	Ganesar College of Arts & Science	6 Months
49	CB19S191645	P.LAKSHMI	Miss PL.SUDHA	16SMBECPSPW	PROJECTWORK	Plant Disease Prediction	Ganesar College of Arts & Science	6 Months
50	CB19S191599	R.DINESHKUMAR	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Human Resources Management System	Ganesar College of Arts & Science	6 Months
51	CB19S191614	T.MEIYARASAN	Miss RM.VALLAIAMMAI	16SMBECPSPW	PROJECTWORK	Human Resources Management System	Ganesar College of Arts & Science	6 Months

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SMART CITY IN PUDUKKOTTAI

A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

S.AJITHKUMAR

Reg No: CB19S191589

&

A.ARAVINDHSAMY

Reg No: CB19S191591

Under the Guidance of

Mr R.RAJA M.Sc., M.Phil., B.Ed.,



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Tamil Nadu

APRIL-2022



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CERTIFICATE

This is to certify that the project work entitled "SMART CITY IN PUDUKKOTTAI" is a bonafide record done by S.AJITHKUMAR (Reg No: CB19S191589) & A.ARAVINDHSAMY (Reg No: CB19S191591) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021– 2022.

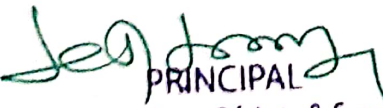
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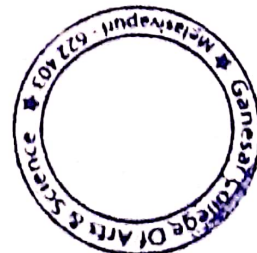
R. R. — 25/5/22
Signature of the Guide

R. R. — 25/5/22
Head of the department
Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

1. R. R. — 27/05/22
2. R. R. — 27/05/22


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Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



ENSURING DISTRIBUTED ACCOUNTABILITY FOR DATA SHARING IN THE CLOUD

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

K.DHARANI

Reg No: CB19S191597

&

P.DURGA

Reg No: CB19S191600

Under the Guidance of

Miss PL. SUDHA M.Sc., M.Phil.,



Department of Computer Science

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Accredited by NAAC with "B" Grade

MELAISIVAPURI – 622 403

Tamil Nadu

APRIL-2022

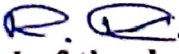


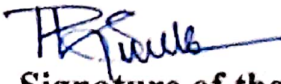
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CERTIFICATE

This is to certify that the project work entitled "ENSURING DISTRIBUTED ACCOUNTABILITY FOR DATA SHARING IN THE CLOUD" is a bonafide record done by **K.DHARANI (Reg No: CB19S191597) & P.DURGA (Reg No: CB19S191600)** in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021- 2022.


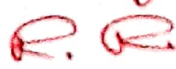
The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melaisivapuri.

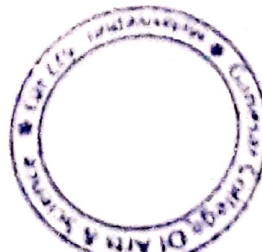
 25/5/22
Head of the department
Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403


Signature of the Guide


PRINCIPAL
Ganesar College Of Arts & Science
MELASIVAPURI - 622 403

External Examiner

1. 
2.  27/05/22



SOFTWARE LICENSE MONITORING SYSTEM

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

A.KARTHIKA

Reg No: CB19S191607

&

R.MURUGESHWARI

Reg No: CB19S191617

Under the Guidance of

Miss **RM.VALLIAMMAI., M.Sc.,**



Department of Computer Science

Ganesar College of Arts and science

Accredited by NAAC with "B"Grade

MELAISIVAPURI – 622 403

TamilNadu

APRIL-2022



Miss RM.VALLIAMMAI.,M.Sc.,

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This is to certify that the project work entitled “**Software License Monitoring System**” is a bonafide record done By **A.KARTHIKA** (Reg No: CB19S191607) & **R.MURUGESHWARI** (Reg No: CB19S191617) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021–2022.

The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melasivapuri.

Rm. Valliammai
27/05/22
Signature of the Guide

R. R. — 25/5/22
Head of the department

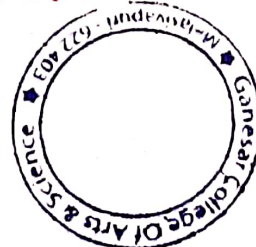
Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

1. *[Signature]* 27/05/22

2. *[Signature]* 27/05/22

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PRINCIPAL
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MELASIVAPURI - 622 403



Smart Construction Plus

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

A.JOTHIKA

Reg No: CB19S191603

&

K.PRIYADHARSHINI

Reg No: CB19S191623

Under the Guidance of

Mr R.RAJA M.Sc., M.Phil.,B.Ed.,



Department of Computer Science

Ganesar College of Arts and Science

Accredited by NAAC with "B" Grade

MELAISIVAPURI – 622 403

Tamil Nadu

APRIL-2022



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CERTIFICATE

This is to certify that the project work entitled "**Smart Construction Plus**" is a bonafide record done by A. JOTHIKA (Reg No: CB19S191603) & K.PRIYADHARSHINI (Reg No: CB19S191623) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021- 2022.

The Viva-voice examination was conducted on 27-05-22 at Ganesar College of Arts and science , Melaisivapuri.

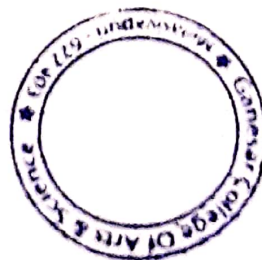
R.R. - 25/5/22
Head of the department
Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

R.R. - 25/5/22
Signature of the Guide

[Signature]
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MELASIVAPURI - 622 403

External Examiner

- [Signature]* 27/05/22
- R.R. - 27/05/22*



EMPLOYEE TRACKER SYSTEM

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

N.BHARATHIDASAN

Reg No: CB19S191595

&

A.SURYA

Reg No: CB19S191634

Under the Guidance of

Miss PL. SUDHA.,M.Sc.,M.Phil.,



Department of Computer Science
Ganesar College of Arts and Science

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MELAISIVAPURI – 622 403

Tamil Nadu

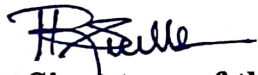
APRIL-2022

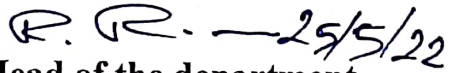
Miss PL. SUDHA.,M.Sc., M.Phil.,
Department of Computer Science,
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Melasipuri,Pudukkottai Dt.-622403.

CERTIFICATE

This is to certify that the project work entitled "EMPLOYEE TRACKER SYSTEM" is a bonafide record done by N.BHARATHIDASAN (Reg No: CB19S191595 & A.SURYA (Reg No: CB19S191634) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.

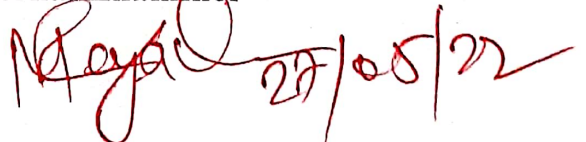

The Viva-voice examination was conducted on 27/05/2022 at Ganesar College of Arts and science , Melaisivapuri.



Signature of the Guide

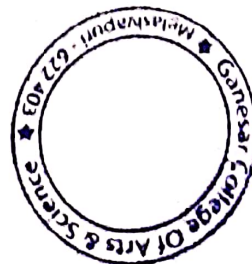

Head of the department

Head
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Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

1.  27/05/22
2.  27/5/22


PRINCIPAL
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MELASIVAPURI - 622 403



HUMAN RESOURCES MANAGEMENT SYSTEM

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

R.DINESHKUMAR

Reg No: CB19S191599

&

T.MEIYARASAN

Reg No: CB19S191614

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APRIL-2022



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This is to certify that the project work entitled "HUMAN RESOURCES MANAGEMENT SYSTEM " is a bonafide record done by R.DINESHKUMAR (Reg No: CB19S191599) & T.MEIYARASAN (Reg No: CB19S191614) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021– 2022.

The Viva-voice examination was conducted on 27-05-2022 at Ganesar College of Arts and science , Melaisivapuri.

Rm. Valliammai
Signature of the Guide

R.R. — 26/5/22
Head of the department
Head

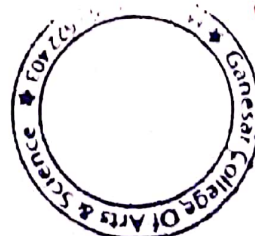
Department of Computer Science
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Pudukkottai - 622403

External Examiner

1. *N. Jayaraj* 27/05/22

2. *R.R.* — 27/05/22

J. S. S. S.
PRINCIPAL
Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



INDIA MAPPING SOLUTIONS

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

B.INBATAMILAN

Reg No: CB19S191602

&

P.THINAKARAN

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CERTIFICATE

This is to certify that the project work entitled "INDIA MAPPING SOLUTIONS" is a bonafide record done by **B.INBATAMILAN (Reg No: CB19S191602) & P.THINAKARAN (Reg No: CB19S191638)** in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021- 2022.

The Viva-voice examination was conducted on 27/05/2022 at Ganesar College of Arts and science , Melaisivapuri.

R.R. — 25/5/22
Head of the department

Head
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Pudukkottai - 622403

R.R. — 25/5/22
Signature of the Guide

External Examiner

1.

N. K. — 27/5/22

2.

R.R. — 27/05/22

J. J. —
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PLANT DISEASE PREDICTION

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

N.DURGALAKSHMI

Reg No: CB19S191643

&

P.LAKSHMI

Reg No: CB19S191645

Under the Guidance of

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MELAISIVAPURI – 622 403

Tamil Nadu

APRIL-2022



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This is to certify that the project work entitled "PLANT DISEASE PREDICTION" is a bonafide record done by N.DURGALAKSHMI (Reg No: CB19S191643) & P.LAKSHMI (Reg No: CB19S191645) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021- 2022.

The Viva-voice examination was conducted on 27/05/2022 at Ganesar College of Arts and science , Melaisivapuri.

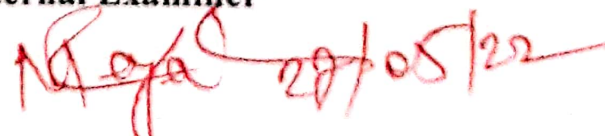



Signature of the Guide

R. R. — 25/5/22
Head of the department

Head
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Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

1.  27/05/22
2.  27/05/22


PRINCIPAL
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FIRST ROUND

A Project

*Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of*

BACHELOR OF COMPUTER SCIENCE

By

M.RAJESHWARI

Reg No: CB19S191627

&

M.SNEKA

Reg No: CB19S191631

Under the Guidance of

Miss R.M.VALLIAMMAL, M.Sc.,



**Department of Computer Science
Ganesar College of Arts and Science**

Accredited by NAAC with "B" Grade

MELAINIVAPURI - 622 403

Tamil Nadu

APRIL-2022

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CERTIFICATE

This is to certify that the project work entitled "FIRST ROUND" is a bonafide record done by M.RAJESHWARI (Reg No: CB19S191627) & M.SNEKA (Reg No: CB19S191631) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.

The Viva-voice examination was conducted on 27/05/2022 at Ganesar College of Arts and science , Melaisivapuri.

Rm. Valliammai
Signature of the Guide

R. E. - 26/5/22
Head of the department

Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

1.

M. Raja
27/05/22

2.

R. E.

27/05/22

Lothar
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MELASIVAPURI - 622 403



**PRIVACY-PRESERVING PUBLIC AUDITING FOR DATA
STORAGE SECURITY IN CLOUD COMPUTING**

A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

S.SRIKA

Reg No: CB19S191632

&

S.SUDHABHARATHI

Reg No: CB19S191635

Under the Guidance of

Mr R.RAJA M.Sc., M.Phil., B.Ed.,



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Tamil Nadu

APRIL-2022




Mr R.RAJA M.Sc., M.Phil., B.Ed.,
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CERTIFICATE

This is to certify that the project work entitled "PRIVACY-PRESERVING PUBLIC AUDITING FOR DATA STORAGE SECURITY IN CLOUD COMPUTING" is a bonafide record done by S.SRIKA (Reg No: CB19S191632) & S.SUDHABHARATHI (Reg No: CB19S191635) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.

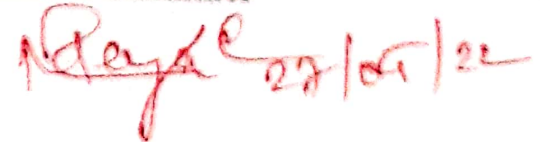
The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melasivapuri.


Signature of the Guide


Head of the department

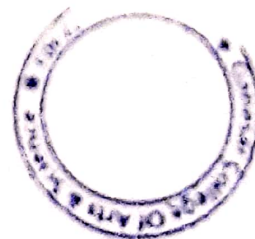
Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403.

External Examiner

1.  27/05/22

2.  27/05/22


PRINCIPAL
Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



TECHNO TASK MANAGER

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

M.KANAGARAJA

Reg No: CB19S191606

&

P.TAMILSELVAN

Reg No: CB19S191637

Under the Guidance of

Miss PL.SUDHA M.Sc., M.Phil.,



Department of Computer Science
Ganesar College of Arts and Science

Accredited by NAAC with "B" Grade

MELAISIVAPURI – 622 403

Tamil Nadu

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Department of Computer Science,
Ganesar College Of Arts And Science,
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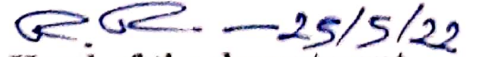
CERTIFICATE

This is to certify that the project work entitled "TECHNO TASK MANAGER" is a bonafide record done by M.KANAGARAJA (Reg No: CB19S191606) & P.TAMILSELVAN (Reg No: CB19S191637) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021- 2022.

The Viva-voice examination was conducted on 27-05-2022 at Ganesar College of Arts and science , Melasivapuri.



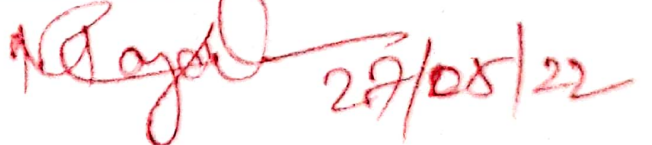

Signature of the Guide



Head of the department
Head

Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

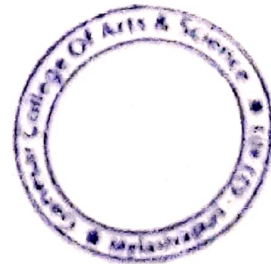
External Examiner

1.  27/05/22
2.  27/05/22



PRINCIPAL

Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



TAXATION INFORMATION SYSTEM

A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

A.ARTHI

Reg No: CB19S191592

&

K.BANUMATHI

Reg No: CB19S191594

Under the Guidance of

Miss **RM.VALLIAMMAI, M.Sc.,**



Department of Computer Science

Ganesar College of Arts and science

Accredited by NAAC with "B"Grade

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APRIL-2022



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Melasipuri,Pudukkottai Dt.-622403.

CERTIFICATE

This is to certify that the project work entitled "TAXATION INFORMATION SYSTEM" is a bonafide record done By A.ARTHI(Reg No: CB19S191592) & K.BANUMATHI(Reg No: CB19S191594) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2020- 2021.

The Viva-voce examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melasivapuri.

RM. Valliammai
Signature of the Guide 26/05/22

P.R. — 26/5/22
Head of the department
Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

1. *K. Rajal* 27/05/22

2. *P.R.* 27/05/22

Leopoldo
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Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



SPIRITUAL TOURISM

A Project

**Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of**

BACHELOR OF COMPUTER SCIENCE

By

A.AZHAGU

Reg No: CB19S191593

&

N.YUVARAJ

Reg No: CB19S191642.

Under the Guidance of

Mr R.RAJA M.Sc., M.Phil., B.Ed.,



**Department of Computer Science
Ganesar College of Arts and Science**

Accredited by NAAC with "B" Grade

MELAISIVAPURI – 622 403

Tamil Nadu

APRIL-2022

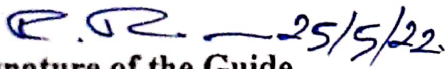


Mr.R.RAJA , M.Sc.,M.Phil.,B.Ed.,
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Melasipuri,Pudukkottai Dt.-622403.

CERTIFICATE


This is to certify that the project work entitled "SPIRITUAL TOURISM"
is a bonafide record done by A.AZHAGU(Reg No: CB19S191593) &
N.YUVARAJ (Reg No: CB19S191642) in partial fulfillment of the requirements
for the award of the degree of Bachelor of Computer Science, during the academic
year 2021-2022.

The Viva-voce examination was conducted on 27/05/2022 at
Ganesar College of Arts and science , Melaisivapuri.


Signature of the Guide

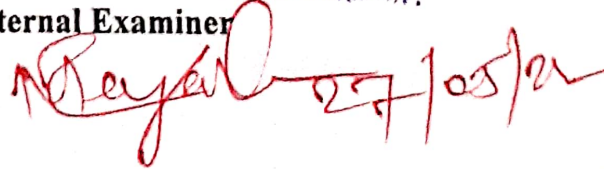

Head of the department

Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622

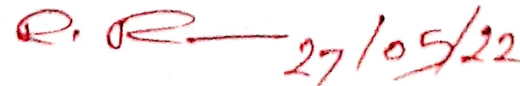

PRINCIPAL
Ganesar College Of Arts & Science
MELASIVAPURI - 622 403

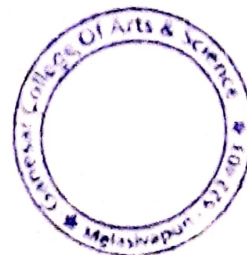
External Examiner

1.


27/05/22

2.


27/05/22



**DEFENSES AGAINST ONLINE PASSWORD GUESSING
ATTACKS BY USING PERSUASIVE CLICK POINTS**

A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

P.SARANYA

Reg No: CB19S191629

&

V.VARSHARANI

Reg No: CB19S191640

Under the Guidance of

Miss PL.SUDHA M.Sc., M.Phil.,



**Department of Computer Science
Ganesar College of Arts and Science**

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MELAISIVAPURI – 622 403

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APRIL-2022

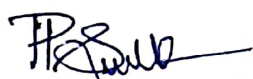


Miss.PL.SUDHA.,M.Sc.,M.Phil.,
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CERTIFICATE

This is to certify that the project work entitled “DEFENSES AGAINST ONLINE PASSWORD GUESSING ATTACKS BY USING PERSUASIVE CLICK POINTS ” is a bonafide record done by P.SARANYA (Reg No: CB19S191629) & V.VARSHARANI (Reg No: CB19S191640) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021– 2022.

The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melaisivapuri.




Signature of the Guide

R.R. — 25/5/22
Head of the department

Head
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Ganesar College of Arts & Science
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Pudukkottai - 622403

External Examiner

1.  27/05/22
2. R.R. — 27/05/22



PRINCIPAL
Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



**SECURE AND EFFICIENT RANKING BASED TRUST
PREDICTION IN ALIBABA E-COMMERCE WEB**

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

S.GOKULAKRISHNAN

Reg No: CB19S191601

&

K.RAJAPANDIYAN

Reg No: CB19S191626

Under the Guidance of

Miss RM.VALLIAMMAI, M.Sc.,



**Department of Computer Science
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Accredited by NAAC with "B" Grade

MELAISIVAPURI – 622 403

Tamil Nadu

APRIL-2022



Miss RM.VALLIAMMAL., M.Sc.,
Department of Computer Science,
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CERTIFICATE

This is to certify that the project work entitled "SECURE AND EFFICIENT RANKING BASED TRUST PREDICTION IN ALIBABA E-COMMERCE WEB" is a bonafide record done by S.GOKULAKRISHNAN (Reg No: CB19S191601) & K.RAJAPANDIYAN (Reg No: CB19S191626) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021- 2022.

The Viva-voice examination was conducted on 27-05-2022 at Ganesar College of Arts and science , Melaisivapuri.

R. Valliammal
Signature of the Guide

R.R - 26/05/22
Head of the department
Head

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Pudukkottai - 622403.

External Examiner

1. *N. Raja* 27/5/22

2. *R.R* 27/05/22

Jagan
PRINCIPAL
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MELASIVAPURI - 622 403



ONLINE CALL LOGGING AND CUSTOMER SUPPORT SYSTEM

A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

Submitted by

R.DINESH

Reg No: CB19S191598

&

P.KARUPPIAH

Reg No: CB19S191608

Under the Guidance of

Mr R.RAJA M.Sc., M.Phil., B.Ed.,



Department of Computer Science
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Tamil Nadu
APRIL-2022


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CERTIFICATE

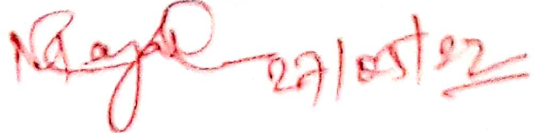

This is to certify that the project work entitled "ONLINE CALL LOGGING AND CUSTOMER SUPPORT SYSTEM" is a bonafide record done by R.DINESH (Reg No: CB19S191598) & P.KARUPPIAH (Reg No: CB19S191608) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.


The Viva-voice examination was conducted on 27.5.2022 at Ganesar College of Arts and science , Melaisivapuri.

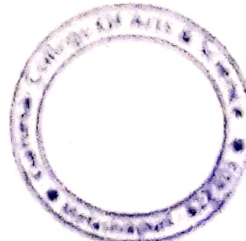

Signature of the Guide


Head of the department
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Melasivapuri, Ponnamaravathi
Pudukkottai - 622403.

External Examiner

-  27/05/22
-  27/05/22


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MELASIVAPURI - 622 403



**SECURE DATA SHARING IN CLOUD COMPUTING
USING REVOCABLE-STORAGE IDENTITY-BASED
ENCRYPTION**

**A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of**

BACHELOR OF COMPUTER SCIENCE

By

R.SUMITHASRI

Reg No: CB19S191633

&

G.KAVITHA

Reg No: CB19S191644

Under the Guidance of

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APRIL-2022





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CERTIFICATE

This is to certify that the project work entitled "SECURE DATA SHARING IN CLOUD COMPUTING USING REVOCABLE-STORAGE IDENTITY-BASED ENCRYPTION" is a bonafide record done by R.SUMITHASRI (Reg No: CB19S191633) & G.KAVITHA (Reg No: CB19S191644) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021– 2022.


The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melaisivapuri.


Signature of the Guide


Head of the department

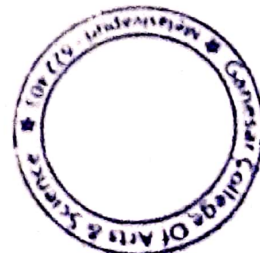
Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

1.  27/05/22

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MELASIVAPURI - 622 403



ONLINE CAR AUCTION SITE

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

P.ANBUSELVAM

Reg No: CB19S191590

&

T.RAHUL

Reg No: CB19S191624

Under the Guidance of

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MELAISIVAPURI – 622 403

Tamil Nadu

APRIL-2022



Miss PL. SUDHA M.Sc., M.Phil.,
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Ganesar College Of Arts And Science,
Melasivapuri, Pudukkottai Dt.-622403.

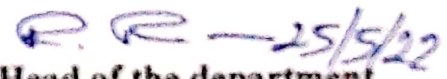
CERTIFICATE

This is to certify that the project work entitled "ONLINE CAR AUCTION SITE " is a bonafide record done by P.ANBUSELVAM(Reg No: CB19S191590) & T.RAHUL (Reg No: CB19S191624) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.

The Viva-voice examination was conducted on 27-05-2022 at Ganesar College of Arts and science , Melasivapuri.



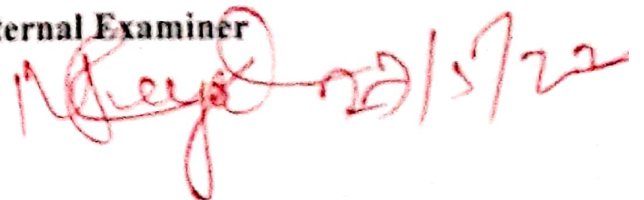
Signature of the Guide



Head of the department
Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 6224.

External Examiner

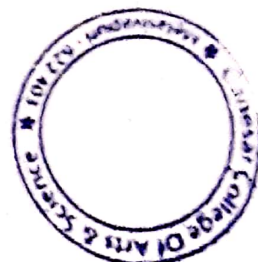
1.



2.



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SECURE DISTRIBUTED DEDUPLICATIONS SYSTEM WITH IMPROVED RELIABILITY

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

Submitted by

S.MUTHUSELVI

Reg No: CB19S191618

&

M.SUWETHA

Reg No: CB19S191636

Under the Guidance of

Mr R.RAJA M.Sc., M.Phil., B.Ed.,



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Ganesar College of Arts and Science**

Accredited by NAAC with "B" Grade

MELAISIVAPURI – 622 403

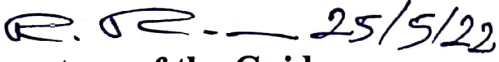
**Tamil Nadu
APRIL-2022**

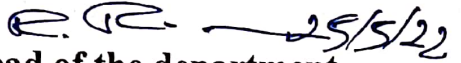
Mr.R.RAJA , M.Sc.,M.Phil.,B.Ed.,
Department of Computer Science,
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Melasipuri,Pudukkottai Dt.-622403.

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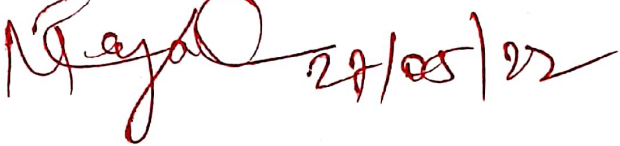
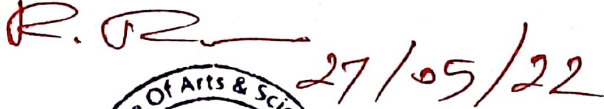
This is to certify that the project work entitled “SECURE DISTRIBUTED DEDUPLICATIONS SYSTEM WITH IMPROVED RELIABILITY” is a bonafide record done by S.MUTHUSELVI (Reg No: CB19S191618) & M.SUWETHA (Reg No: CB19S191636) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021– 2022.


The Viva-voice examination was conducted on 27/05/2022 at Ganesar College of Arts and science , Melaisivapuri.

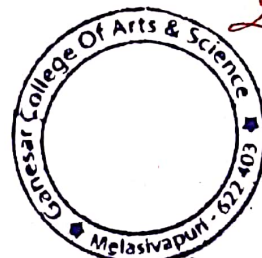

Signature of the Guide


Head of the department
Head
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Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

- 
27/05/22
- 
27/05/22


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Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



STUDENT AND STAFF INTERACTION SOFTWARE

A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

M.LOGESH

Reg No: CB19S191611

&

K.SHANMUGANATHAN

Reg No: CB19S191630

Under the Guidance of
Miss PL.SUDHA M.Sc., M.Phil.,



Department of Computer Science

Ganesar College of Arts and Science

Accredited by NAAC with "B" Grade

MELAISIVAPURI – 622 403

Tamil Nadu

APRIL-2022



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This is to certify that the project work entitled "STUDENT AND STAFF INTERACTION SOFTWARE " is a bonafide record done by M.LOGESH (Reg No: CB19S191611) & K.SHANMUGANATHAN (Reg No: CB19S191630) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.

The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melaisivapuri.




Signature of the Guide



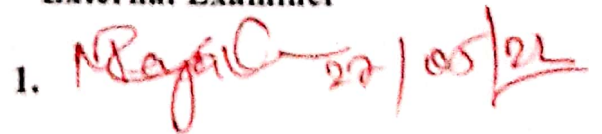
Head of the department

Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

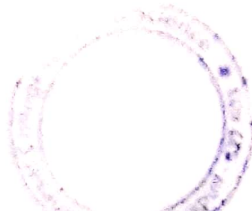


PRINCIPAL
Ganesar College Of Arts & Science
MELASIVAPURI - 622 403

External Examiner

1.  27/05/22

2.  27/5/22



ONLINE BUG TRACKING SYSTEM

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

T.LOGAMMAL

Reg No: CB19S191610

&

C.VELLAIYAMMAL

Reg No: CB19S191641

Under the Guidance of

Mr R.RAJA M.Sc., M.Phil., B.Ed.,



Department of Computer Science

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MELAISIVAPURI – 622 403

Tamil Nadu

APRIL-2022

Mr R.RAJA M.Sc., M.Phil., B.Ed.,
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CERTIFICATE

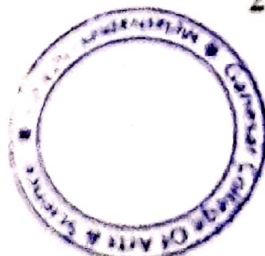
This is to certify that the project work entitled "ONLINE BUG TRACKING SYSTEM" is a bonafide record done by T.LOGAMMAL (Reg No: CB19S191610) & C.VELLAIYAMMAL (Reg No: CB19S191641) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.

The Viva-voice examination was conducted on ~~23.05.2022~~ at Ganesar College of Arts and science , Melaisivapuri.

R.R. - 25/5/22
Head of the department
Head
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Pudukkottai - 622403

R.R. - 25/5/22
Signature of the Guide

Joseph
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Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



External Examiner

1.

N. Raja 27/5/22

2.

R.R. 27/5/22



FRUIT BILLING SOFTWARE

A Project

**Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of**

BACHELOR OF COMPUTER SCIENCE

By

R.ADHIPAN

Reg No: CB19S191587

&

A.MURUGANANTHAM

Reg No: CB19S191615

Under the Guidance of

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Ganesar College of Arts and Science

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APRIL-2022



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This is to certify that the project work entitled "FRUIT BILLING SOFTWARE " is a bonafide record done by R.ADHIPAN (Reg No: CB19S191587) & A.MURUGANANTHAM (Reg No: CB19S191615) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021- 2022.

The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melaisivapuri.

P. R. - 25/5/22

Head of the department

Head
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Pudukkottai - 622403

[Signature]

Signature of the Guide

External Examiner

1. *[Signature]* 27/05/22

2. *[Signature]* 27/05/22

[Signature]
PRINCIPAL

Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



GEOSPATIAL INFO-TECH SOLUTION

A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

K.KALAIYARASI

Reg No: CB19S191604

&

M.NANDHINI

Reg No: CB19S191620

Under the Guidance of

Miss RM.VALLIAMMAI., M.Sc.,



DEPARTMENT OF COMPUTER SCIENCE
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Accredited by NAAC with "B" Grade

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CERTIFICATE

This is to certify that the project work entitled "GEOSPATIAL INFO-TECH SOLUTION" is a bonafide record done by **K.KALAIYARASI (Reg No: CB19S191604) & M.NANDHINI (Reg No: CB19S191620)** in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021- 2022.

The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melaisivapuri.

R. R. - 26/5/22
Head of the department

Rm. Valliammai 26/05/22
Signature of the Guide
Head
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Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

1.

N. S. S. 28/05/22

2.

R. R. - 27/05/22

[Signature]
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MELASIVAPURI - 622 403



WALK AROUND CONCEALED BUILDINGS FOR INTERNAL FLOOR PLAN STRUCTURE

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

S.NIVETHA

Reg No: CB19S191621

&

V.RENUKA

Reg No: CB19S191628

Under the Guidance of

Mr R.RAJA M.Sc., M.Phil., B.Ed.,



**Department of Computer Science
Ganesar College of Arts and Science**

Accredited by NAAC with "B" Grade

MELAISIVAPURI – 622 403

Tamil Nadu

APRIL-2022




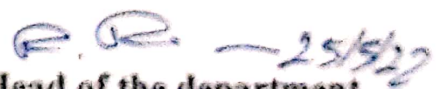
Mr.R.RAJA , M.Sc.,M.Phil.,B.Ed.,
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Melasipuri,Pudukkottai Dt.-622403.


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This is to certify that the project work entitled "WALK AROUND CONCEALED BUILDINGS FOR INTERNAL FLOOR PLAN STRUCTURE" is a bonafide record done by S.NIVETHA (Reg No: CB19S191621) & V. RENUKA (Reg No: CB19S191628) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021- 2022.

The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melaisivapuri.



Signature of the Guide


Head of the department
Department of Computer Science
Ganesar College of Arts and Science
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Pudukkottai - 622403


PRINCIPAL
Ganesar College Of Arts & Science
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External Examiner

1.



2.





OPTIMIZED K-MEANS ALGORITHM AND APPLICATION IN CRM SYSTEM

A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

SP.KALYANI

Reg No: CB19S191605

&

A.NANDHINI

Reg No: CB19S191619

Under the Guidance of

Miss PL. SUDHA M.Sc., M.Phil.,



Department of Computer Science

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APRIL-2022



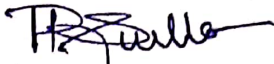
Miss.PL.SUDHA,M.Sc.,M.Phil.,
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Melasipuri,Pudukkottai Dt.-622403.

CERTIFICATE


This is to certify that the project work entitled "OPTIMIZED K-MEANS ALGORITHM AND APPLICATION IN CRM SYSTEM " is a bonafide record done by SP.KALYANI (Reg No: CB19S191605) & A.NANDHINI (Reg No: CB19S191619) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.

The Viva-voice examination was conducted on 27.05.2022 at Ganesar College of Arts and science , Melaisivapuri.

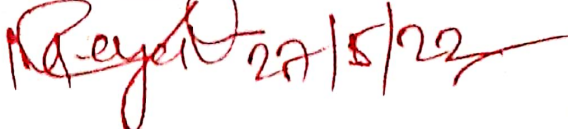

Head of the department


Signature of the Guide

Head
Department of Computer Science
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Melasivapuri, Ponnamaravathi
Pudukkottai - 6224


PRINCIPAL
Ganesar College Of Arts & Science
MELASIVAPURI - 622 403

External Examiner

1.  27/5/22

2.  27/5/22



SECURE DATA DEDUPLICATION WITH ACCESS CONTROL MANAGEMENT IN CLOUD STORAGE

A Project
Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

J.ABINAYA

Reg No: CB19S191586

Under the Guidance of

Miss RM.VALLIAMMAI., M.Sc.,



Department of Computer Science

Ganesar College of Arts and science

Accredited by NAAC with "B"Grade

MELAISIVAPURI – 622 403

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APRIL-2022

Miss RM.VALLIAMMAL,M.Sc.,

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Melasipuri,Pudukkottai Dt.-622403.

CERTIFICATE

This is to certify that the project work entitled "SECURE DATA DEDUPLICATION WITH ACCESS CONTROL MANAGEMENT IN CLOUD STORAGE" is a bonafide record done By J.ABINAYA (Reg No: CB19S191586) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.

The Viva-voice examination was conducted on 27-05-2022 at Ganesar College of Arts and science , Melasivapuri.

R.M. Valliammal
Signature of the Guide 26/05/22

R.R. — 26/5/22
Head of the department

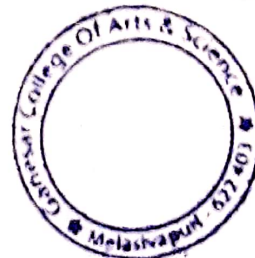
Head
Department of Computer Science
Ganesar College of Arts and Science
Melasivapuri, Ponnamaravathi
Pudukkottai - 622403

External Examiner

1. *N. Rajan* 27/05/22

2. *R.R.* — 27/05/22

J. J. J.
PRINCIPAL
Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



ONLINE BUG TRACKING SYSTEM

A Project

Submitted to the Bharathidasan University
in partial fulfillment of the requirements
for the award of the Degree of

BACHELOR OF COMPUTER SCIENCE

By

T.LOGAMMAL

Reg No: CB19S191610

&

C.VELLAIYAMMAL

Reg No: CB19S191641

Under the Guidance of

Mr R.RAJA M.Sc., M.Phil., B.Ed.,



Department of Computer Science

Ganesar College of Arts and Science

MELAISIVAPURI – 622 403

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APRIL-2022



Mr R.RAJA M.Sc., M.Phil., B.Ed.,
Department of Computer Science,
Ganesar College Of Arts And Science,
Melasipuri,Pudukkottai Dt.-622403.

CERTIFICATE

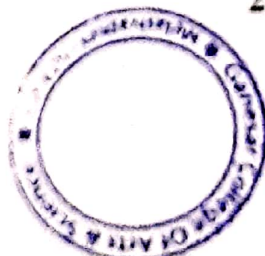
This is to certify that the project work entitled "ONLINE BUG TRACKING SYSTEM" is a bonafide record done by T.LOGAMMAL (Reg No: CB19S191610) & C.VELLAIYAMMAL (Reg No: CB19S191641) in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Science, during the academic year 2021-2022.

The Viva-voice examination was conducted on 25.05.2022 at Ganesar College of Arts and science , Melaisivapuri.

R.R. - 25/5/22
Head of the department
Head
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Ganesar College of Arts and Science
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R.R. - 25/5/22
Signature of the Guide

Joseph
PRINCIPAL
Ganesar College Of Arts & Science
MELASIVAPURI - 622 403



External Examiner

1.

N. Raja 25/5/22

2.

R.R. 27/5/22



ACKNOWLEDGEMENT

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ABSTRACT

ONLINE BUG TRACKING SYSTEM

ABSTRACT

The project titled “**ONLINE BUG TRACKING SYSTEM**” is designed using Active Server Pages .NET with Microsoft Visual Studio.Net 2010 as front end and Microsoft SQL Server 2008 as back end which works in .Net framework version 2.1. The coding language used is C#.Net.

The project contains three main modules. These are Administrator, Staff and Customer. The administrator logs in to the application and enters the details are Staff Entry, Project Entry, View New Bugs From Customers, Assign Bug to staff, View Bug case flow status details, Send message to customers. The staff details are username, password, category and Email Id. The project details are name and description. The bug details are project name, error category, error details, print screen of the bug, due date to reply for the bug. Bug assign details include the ticket number which is generated for the bug and other messages. Case flow details include bug details, which staffs are involved in solving the bug, and the status. The message sending includes the message details for the bug solution. The staff may login to the site using username and password. Then he may view the bugs assigned to them. He can directly give solution message to customers or he can assign the bugs to other staffs if the bug is related to them. The user may view bug case flow details with which he involved. The customer registers in to the applications and login to the site using username and password, whenever a bug is raised from his software; he sends the bug details to the administrator with print screen of the bug generated. He may see the bug case flow details and bug status along with remedy details at any time using the ticket number generated during new bug entry.

1.1 PROJECT DESCRIPTION

The project contains the following main modules:

The project contains three main modules:

1. Administrator
2. Staff
3. Customer.

Administrator:

The administrator logs in to the application and enters the following details.

1. Staff Entry.
2. Project Entry.
3. View New Bugs From Customers.
4. Assign Bug to staff.
5. View Bug case flow status details.
6. Send message to customers

- The staff details are username, password, category and Email Id.
- The project details are name and description.
- The bug details are project name, error category, error details, print screen of the bug, due date to reply for the bug.
- Bug assign details include the ticket number which is generated for the bug and other messages.
- Case flow details include bug details, which staffs are involved in solving the bug, and the status.
- The message sending includes the message details for the bug solution.

Staff:

- The staff may login to the site using username and password.
- Then he may view the bugs assigned to them. He can directly give solution message to customers or he can assign the bugs to other staffs if the bug is related to them.
- The user may view bug case flow details with which he involved.

Customer:

- The customer registers in to the applications and login to the site using username and password.
- Whenever a bug is raised from his software, he sends the bug details to the administrator with print screen of the bug generated.
- He may see the bug case flow details and bug status along with remedy details at any time using the ticket number generated during new bug entry.

2. SYSTEM STUDY

2.1 Feasibility System

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- ∞ ECONOMICAL FEASIBILITY
- ∞ TECHNICAL FEASIBILITY
- ∞ SOCIAL FEASIBILITY

ECONOMICAL FEASIBILITY:

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

TECHNICAL FEASIBILITY:

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client.

The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

SOCIAL FEASIBILITY:

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

2.2 Existing System

The call centers (technical) may attend the calls through phone and rectify their problems. It can take lot of time and money. The client can't describing the full details of the problems, so to solve the problems is very difficulty.

2.3 Proposed System

In our issue track system (call center website) clients will register their issues (problems) .Our company employees will process the issues and give the solutions through website. In this we are using the internet without phone. So it will reduce the cost and time.

SYSTEM SPECIFICATION

3. SYSTEM SPECIFICATION

HARDWARE CONFIGURATION

Processor/System : Intel Dual Core 2.1
Main memory : 2GB Ram
Cache Memory : 512 KB
Keyboard : 101Keys
Hard disk drive : 250 GB

SOFTWARE CONFIGURATION

Operating system : Windows XP
Web server : IIS
Front end : ASP .NET
Programming language : C#
Back end : MS-SQL Server 2008

LANGUAGE SPECIFICATION

4. LANGUAGE SPECIFICATION

4.1) FEATURES OF VISUAL BASIC .NET

Visual Studio .NET is the single IDE that all the .NET languages can use. It makes everything available to all languages.

Visual Studio .NET is a great Multilanguage development environment and offers a complete set of tools to build Windows Forms , ASP.NET Web applications , and XML Web services.

Start Page

The Start page offers three tabs at the top of the window that enables to modify Visual Studio.NET as well as find important information. The tabs are

HTML Server Controls versus Web Server Controls	
Control Type	When to use this Control Type
HTML Server Controls	When converting traditional ASP 3.0 Web pages to ASP.NET Web pages and speed of completion is a concern. It is a lot easier to change your HTML elements to HTML server controls than it is to change them to Web server controls. When you prefer a more HTML-type programming model.
Web Server Controls	When you require a rich set of functionality to perform complicated page requirements. When you are developing web pages that will be viewed by a multitude of browser types and that require different code based on these types. When you prefer a more Visual Basic-type programming model that is based on the use of

	controls and control properties.
--	----------------------------------

Projects tab: This tab is the one to start new projects and launch projects that already exists. This tab lets you to create a new project or open an existing project.

Online Resources tab: This tab provides a number of online resources when connected to the Internet.

My Profile tab: This tab enables to customize the Visual Studio.NET environment to resemble the structured environment that is familiar with.

Server Explorer

This window enables to perform a number of functions such as database connectivity, performance monitoring, and interacting with event logs.

By using Server Explorer you can log on to a remote server and view database and system data about that server. Many of the functions that are performed with the Enterprise Manager in SQL Server can now be executed in the Server Explorer.

Solution Explorer

This provides an organized view of the projects in the application. The toolbar within the Solution Explorer enables to

- View code page of the selected item.
- View design page of the selected item.
- Refresh the state of the selected item.
- Copy the Web project between Web servers.
- Show all the files in the project, including the hidden files.
- See Properties of the selected item.

Class View

The Class View window can be viewed from the Start Page by clicking the Class View tab. The Class View shows all the classes that are contained within your solution.

The Class View shows the hierarchical relationship among the classes in your solution as well as the number of other items including methods, enumerations, namespaces, unions, and events. It is possible to organize the view of these items within the window by right-clicking anywhere in the Class View area and choosing how the items are sorted.

Toolbox

The Toolbox window enables to specify elements that will be part of the Windows Forms or Web Forms. It provides a drag and drop means of adding elements and controls to the pages or forms. The code snippets can also be stored within the Toolbox.

Properties window

This window provides the properties of an item that is part of the application. This enables to control the style and behavior of the item selected to modify.

Dynamic Help

This window shows a list of help topics. The help topics change based on the item selected or the action being taken.

The Dynamic Help window shows the help items displayed when you have a Button control on the page selected. After the item is selected, a list of targeted help topic is displayed. The topics are organized as a list of links. Clicking one of the links in the Dynamic Help window opens the selected help topic in the Document window.

Document window

The Document window is the main window within Visual Studio.NET where the applications are built.

The Document window shows open files in either Design or HTML mode. Each open file is represented by a tab at the top of the Document window. Any number of files can be kept open at the same time, and you can switch between the open files by clicking the appropriate tab.

Design mode versus HTML mode

Visual Studio.NET offers two modes for viewing and building files: Design and HTML. By clicking the Design tab at the bottom of the Document window, you can see how the page will view to the user. The page is built in the Design mode by dragging and dropping elements directly onto the design page or form. Visual Studio .NET automatically generates the appropriate code.

When the page is viewed in HTML mode, it shows the code for the page. It enables to directly modify the code to change the way in which the page is presented.

Working with SQL Server through the Server Explorer

Using Visual Studio.NET , there is no need to open the Enterprise Manager from SQL Server. Visual Studio.NET has the SQL Servers tab within the Server Explorer that gives a list of all the servers that are connected to those having SQL Server on them. Opening up a particular server tab gives five options:

- Database Diagrams
- Tables
- Views
- Stored Procedures
- Functions

Database Diagrams

To create a new diagram right click Database diagrams and select New Diagram. The Add Tables dialog enables to select one to all the tables that you want in the visual diagram you are going to create.

Visual Studio .NET looks at all the relationships between the tables and then creates a diagram that opens in the Document window.

Each table is represented in the diagram and a list of all the columns that are available in that particular table. Each relationship between tables is represented by a connection line between those tables.

The properties of the relationship can be viewed by right clicking the relationship line.

Tables

The Server Explorer allows to work directly with the tables in SQL Server. It gives a list of tables contained in the particular database selected.

By double clicking one of the tables, the table is seen in the Document window. This grid of data shows all the columns and rows of data contained in the particular table.

The data can be added or deleted from the table grid directly in the Document window. To add a new row of data , move to the bottom of the table and type in a new row of data after selecting the first column of the first blank row. You can also delete a row of data from the table by right clicking the gray box at the left end of the row and selecting Delete.

By right clicking the gray box at the far left end of the row, the primary key can be set for that particular column. The relationships to columns in other tables can be set by selecting the Relationships option.

To create a new table right-click the Tables section within the Server Explorer and selecting New Table. This gives the design view that enables to start specifying the columns and column details about the table.

To run queries against the tables in Visual Studio .NET, open the view of the query toolbar by choosing View->Toolbars->Query.

To query a specific table, open that table in the Document window. Then click the SQL button which divides the Document window into two panes-one for query and other to show results gathered from the query.

The query is executed by clicking the Execute Query button and the result is produced in the lower pane of the Document window.

Views

To create a new view , right-click the View node and select New View. The Add Table dialog box enables to select the tables from which the view is produced. The next pane enables to customize the appearance of the data in the view.

4.2 Features of SQL-SERVER

The OLAP Services feature available in SQL Server version 7.0 is now called SQL Server 2005 Analysis Services. The term OLAP Services has been replaced with the term Analysis Services. Analysis Services also includes a new data mining component. The Repository component available in SQL Server version 7.0 is now called Microsoft SQL Server 2005 Meta Data Services. References to the component now use the term Meta Data Services. The term repository is used only in reference to the repository engine within Meta Data Services

SQL-SERVER database consist of six type of objects,

They are,

1. TABLE
2. QUERY
3. FORM
4. REPORT
5. MACRO

TABLE:

A database is a collection of data about a specific topic.

VIEWS OF TABLE:

We can work with a table in two types,

1. Design View
2. Datasheet View

Design View

To build or modify the structure of a table we work in the table design view. We can specify what kind of data will be hold.

Datasheet View

To add, edit or analyses the data itself we work in tables datasheet view mode.

QUERY:

A query is a question that has to be asked the data. Access gathers data that answers the question from one or more table. The data that make up the answer is either dynaset (if you edit it) or a snapshot(it cannot be edited).Each time we run query, we get latest information in the dynaset.Access either displays the dynaset or snapshot for us to view or perform an action on it ,such as deleting or updating.

FORMS:

A form is used to view and edit information in the database record by record .A form displays only the information we want to see in the way we want to see it. Forms use the familiar controls such as textboxes and checkboxes. This makes viewing and entering data easy.

Views of Form:

We can work with forms in several primarily there are two views,

They are,

1. Design View
2. Form View

Design View

To build or modify the structure of a form, we work in forms design view. We can add control to the form that are bound to fields in a table or query, includes textboxes, option buttons, graphs and pictures.

Form View

The form view which display the whole design of the form.

REPORT:

A report is used to view and print information from the database. The report can group records into many levels and compute totals and average by checking values from many records at once. Also the report is attractive and distinctive because we have control over the size and appearance of it.

MACRO:

A macro is a set of actions. Each action in macros does something. Such as opening a form or printing a report .We write macros to automate the common tasks the work easy and save the time.

MODULE:

Modules are units of code written in access basic language. We can write and use module to automate and customize the database in very sophisticated ways.

WHAT IS “.NET”?

Microsoft .NET is a set of Microsoft software technologies for rapidly building and integrating XML Web services, Microsoft Windows-based applications, and Web solutions. The .NET Framework is a language-neutral platform for writing programs that can easily and securely interoperate. There's no language barrier with .NET: there are numerous languages available to the developer including Managed C++, C#, Visual Basic and Java Script. The .NET framework provides the foundation for components to interact seamlessly, whether locally or remotely on different platforms. It standardizes common data types and communications protocols so that components created in different languages can easily interoperate.

“.NET” is also the collective name given to various software components built upon the .NET platform. These will be both products (Visual Studio.NET and Windows.NET Server, for instance) and services (like Passport, .NET My Services, and so on).

THE .NET FRAMEWORK

The .NET Framework has two main parts:

1. The Common Language Runtime (CLR).
2. A hierarchical set of class libraries.

The CLR is described as the “execution engine” of .NET. It provides the environment within which programs run. The most important features are:

- Conversion from a low-level assembler-style language, called Intermediate Language (IL), into code native to the platform being executed on.
- Memory management, notably including garbage collection.
- Checking and enforcing security restrictions on the running code.
- Loading and executing programs, with version control and other such features.

The following features of the .NET framework are also worth description:

Managed Code - is code that targets .NET, and which contains certain extra information - “metadata” - to describe itself. Whilst both managed and unmanaged code can run in the runtime, only managed code contains the information that allows the CLR to guarantee, for instance, safe execution and interoperability.

Managed Data - With Managed Code comes Managed Data. CLR provides memory allocation and Deal location facilities, and garbage collection. Some .NET languages use Managed Data by default, such as C#, Visual Basic.NET and JScript.NET, whereas others, namely C++, do not. Targeting CLR can, depending on the language you're using, impose certain constraints on the features available. As with managed and unmanaged code, one can have both managed and unmanaged data in .NET applications - data that doesn't get garbage collected but instead is looked after by unmanaged code.

Common Type System - The CLR uses something called the Common Type System (CTS) to strictly enforce type-safety. This ensures that all classes are compatible with each other, by describing types in a common way. CTS define how types work within the runtime, which enables types in one language to interoperate with types in another language, including cross-language exception handling. As well as ensuring that types are only used in appropriate ways, the runtime also ensures that code doesn't attempt to access memory that hasn't been allocated to it.

Common Language Specification - The CLR provides built-in support for language interoperability. To ensure that you can develop managed code that can be fully used by developers using any programming language, a set of language features and rules for using them called the Common Language Specification (CLS) has been defined. Components that follow these rules and expose only CLS features are considered CLS-compliant.

THE CLASS LIBRARY

.NET provides a single-rooted hierarchy of classes, containing over 7000 types. The root of the namespace is called System; this contains basic types like Byte, Double, Boolean, and String, as well as Object. All objects derive from System. Object. As well as objects, there are value types. Value types can be allocated on the stack, which can provide useful flexibility. There are also efficient means of converting value types to object types if and when necessary.

The set of classes is pretty comprehensive, providing collections, file, screen, and network I/O, threading, and so on, as well as XML and database connectivity.

The class library is subdivided into a number of sets (or namespaces), each providing distinct areas of functionality, with dependencies between the namespaces kept to a minimum.

LANGUAGES SUPPORTED BY .NET

The multi-language capability of the .NET Framework and Visual Studio .NET enables developers to use their existing programming skills to build all types of applications and XML Web services. The .NET framework supports new versions of Microsoft's old favorites Visual Basic and C++ (as VB.NET and Managed C++), but there are also a number of new additions to the family:

Visual Basic .NET has been updated to include many new and improved language features that make it a powerful object-oriented programming language. These features include inheritance, interfaces, and overloading, among others. Visual Basic also now supports structured exception handling, custom attributes and also supports multi-threading.

Visual Basic .NET is also CLS compliant, which means that any CLS-compliant language can use the classes, objects, and components you create in Visual Basic .NET.

Managed Extensions for C++ and attributed programming are just some of the enhancements made to the C++ language. Managed Extensions simplify the task of migrating existing C++ applications to the new .NET Framework.

C# is Microsoft's new language. It's a C-style language that is essentially "C++ for Rapid Application Development". Unlike other languages, its specification is

just the grammar of the language. It has no standard library of its own, and instead has been designed with the intention of using the .NET libraries as its own.

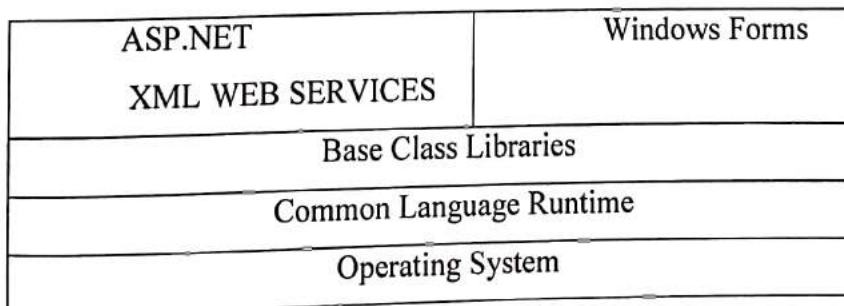
Microsoft Visual J# .NET provides the easiest transition for Java-language developers into the world of XML Web Services and dramatically improves the interoperability of Java-language programs with existing software written in a variety of other programming languages.

Active State has created Visual Perl and Visual Python, which enable .NET-aware applications to be built in either Perl or Python. Both products can be integrated into the Visual Studio .NET environment. Visual Perl includes support for Active State's Perl Dev Kit.

Other languages for which .NET compilers are available include:

- FORTRAN
- COBOL
- Eiffel

Fig1 .Net Framework



INTRODUCTION TO ASP.NET

ASP.NET is the .NET framework layer that handles Web requests for specific types of files, namely those with (.aspx or .ascx) extensions. The ASP.NET engine provides a robust object model for creating dynamic content and is loosely integrated into the .NET framework.

WHAT IS ASP.NET?

ASP.NET is part of the .NET framework. ASP.NET programs are centralized applications hosted on one or more Web servers that respond dynamically to client requests. The responses are dynamic because ASP.NET intercepts requests for pages with a specific extension (.aspx or .ascx) and hands off the responsibility for answering those requests to just-in-time (JIT) compiled code files that can build a response “on-the-fly.”

ASP.NET deals specifically with configuration (web.config and machine.config) files, Web Services (ASMX) files, and Web Forms (ASPX) files. The server doesn't “serve” any of these file types—it returns the appropriate content type to the client. The configuration file types contain initialization and settings for a specific application or portion of an application. Another configuration file, called machine.web, contains machine-level initialization and settings. The server ignores requests for web files, because serving them might constitute a security breach.

Client requests for these file types cause the server to load, parse, and execute code to return a dynamic response. For Web Forms, the response usually consists of HTML or WML. Web Forms maintain state by round-tripping user interface and other persistent values between the client and the server automatically for each request.

A request for a Web Form can use View State, Session State, or Application State to maintain values between requests. Both Web Forms and Web Services requests can take advantage of ASP. Net's integrated security and data access

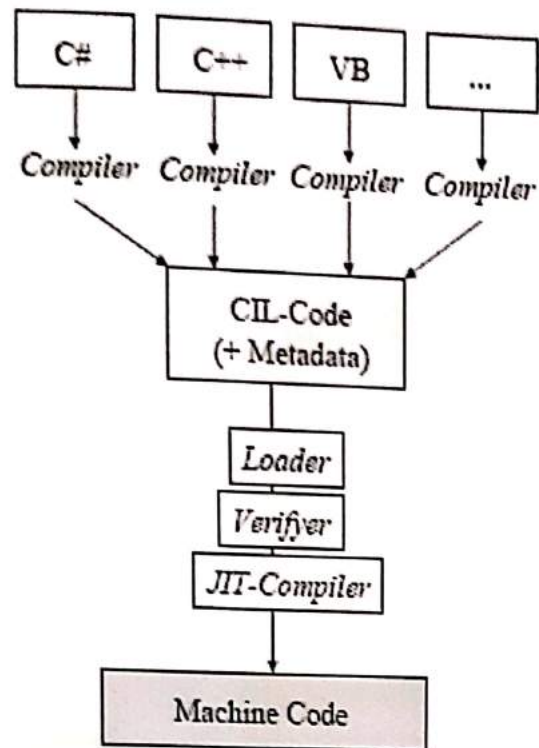
through ADO.NET, and can run code that uses system services to construct the response. So the major difference between a static request and a dynamic request is that a typical Web request references a static file. The server reads the file and responds with the contents of the requested file.

ASP.NET uses .NET languages. ASP.NET code exists in multithreaded JIT compiled DLL assemblies, which can be loaded on demand. Once loaded, the ASP.NET DLLs can service multiple requests from a single in-memory copy.

ASP.NET supports all the .NET languages (currently C#, C++, VB.NET, and JScript, but there are well over 20 different languages in development for .NET), so you will eventually be able to write Web applications in your choice of almost any modern programming language.

In addition to huge increases in speed and power, ASP.NET provides substantial development improvements, like seamless server-to-client debugging, automatic validation of form data.

Fig2. Interoperability



ASP.NET EVENTS

Every time an ASP.NET page is viewed, many tasks are being performed behind the scenes. Tasks are performed at key points ("events") of the page's execution lifecycle.

The most common events are:

OnInit

The first event in our list to be raised is OnInit. When this event is raised, all of the page's server controls are initialized with their property values. Post Back values are not applied to the controls at this time.

On Load

The next event to be raised is On Load, which is the most important event of them all as all the pages server controls will have their Post Back values now.

Post Back Events

Next all the Post Back events are raised. These events are only raised when the page view is the result of a Post Back. The order that these events are raised can't be defined or relied upon; the only consistency with the order that Post Back events are raised is that they are all raised between the Unload and OnPreRender events.

OnPreRender

This event is raised just prior to the page or server control's html output being written into the response stream that's sent to the client web browser. This is last chance you have to make any modifications. By this point, all the server controls on the page have the final data applied.

On Unload

This is the last event in our list to be raised and you should destroy any un-managed objects and close any currently open database connection at this point. It is not possible to modify any controls on the page at this point as the response stream has already been sent to the client web browser.

As each event of the page is raised it also automatically tells all its child controls to raise their own implementation of the same event. In turn each of those controls will tell its own child controls to do the same and so on down the control tree till all controls have done so. Then execution flow is passed back to the main page class to continue onto the next event and the process is repeated for that event.

MAIN FEATURES OF ASP.NET

Successor of *Active Server Pages* (ASP), but completely different architecture

- Object-oriented
- Event-based
- Rich library of Web Controls
- Separation of layout (HTML) and logic (e.g. C#)
- Compiled languages instead of interpreted languages
- GUI can be composed interactively with Visual Studio .NET
- Better state management

NAMESPACES

ASP.NET uses a concept called namespaces. Namespaces are hierarchical object models that support various properties and methods. For example, HTML server controls reside in "System.web.UI.HtmlControls" namespace, web server controls reside in "System.web.UI.WebControls" namespace and ADO+ resides in "System. Data" namespace.

LANGUAGE INDEPENDENT

An ASP.NET page can be created in any language supported by .NET framework. Currently .NET framework supports VB, C#, JScript and Managed C++.

ASP.NET SERVER CONTROLS

Using ASP.NET Server Controls, browser variation is handled because these controls output the HTML themselves based on the browser requesting the page.

TYPES OF CONTROLS

ASP.NET has two basic types of controls: HTML server controls and Web server controls. HTML Server Controls are generated around specific HTML elements and the ASP.NET engine changes the attributes of the elements based on server-side code that you provide. Web server controls revolve more around the functional you need on the page. The ASP.NET engine takes the extra steps to decide based upon the container of the requester, what HTML to output.

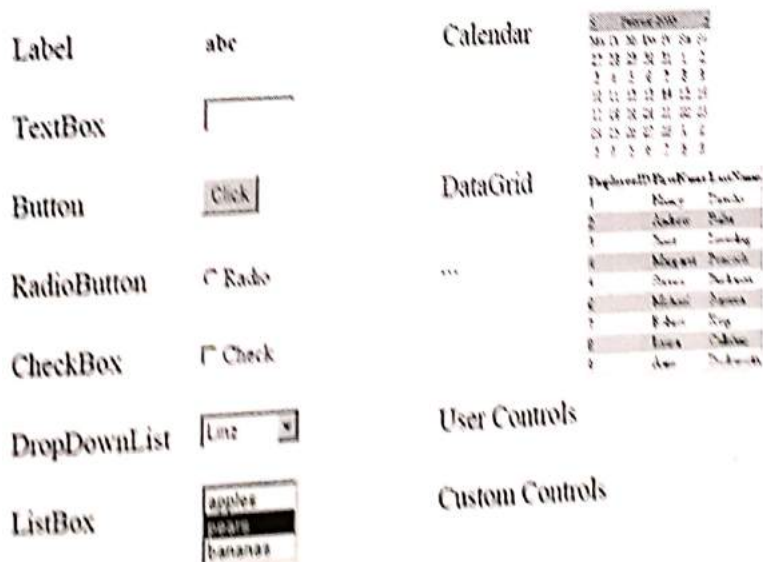


Fig 3. Web Controls

ADO.NET

ADO.NET provides a set of classes which a script can use to interact with databases. Scripts can create instances of ADO.NET data classes and access their properties and methods. A set of classes which work with a specific type of database is known as a **.NET Data Provider**. ADO.NET comes with two Data Providers, the SQL Server.NET Data Provider (which provides optimised access for Microsoft SQL Server databases) and the OLEDB.NET Data Provider, which works with a range of databases. The main ADO.NET OLEDB data access classes are *OLEDBConnection*, *OLEDBCommand*, *OLEDBDataReader* and *OLEDBDataAdapter*.

SYSTEM DESIGN



5. SYSTEM DESIGN

5.1 INPUT DESIGN

Input design is the process of converting user-originated inputs to a computer-based format. Input design is one of the most expensive phases of the operation of computerized system and is often the major problem of a system.

5.2 OUTPUT DESIGN

Output design generally refers to the results and information that are generated by the system for many end-users; output is the main reason for developing the system and the basis on which they evaluate the usefulness of the application.

The output is designed in such a way that it is attractive, convenient and informative. Forms are designed in VB.NET with various features, which make the console output more pleasing.

As the outputs are the most important sources of information to the users, better design should improve the system's relationships with us and also will help in decision-making. Form design elaborates the way output is presented and the layout available for capturing information.

5.3 DATABASE DESIGN

The database design is a must for any application developed especially more for the data store projects. Since the chatting method involves storing the message in the table and produced to the sender and receiver, proper handling of the table is a must.

In the project, login table is designed to be unique in accepting the username and the length of the username and password should be greater than zero. Both the company and seeker username are stored in the same table with different flag values.

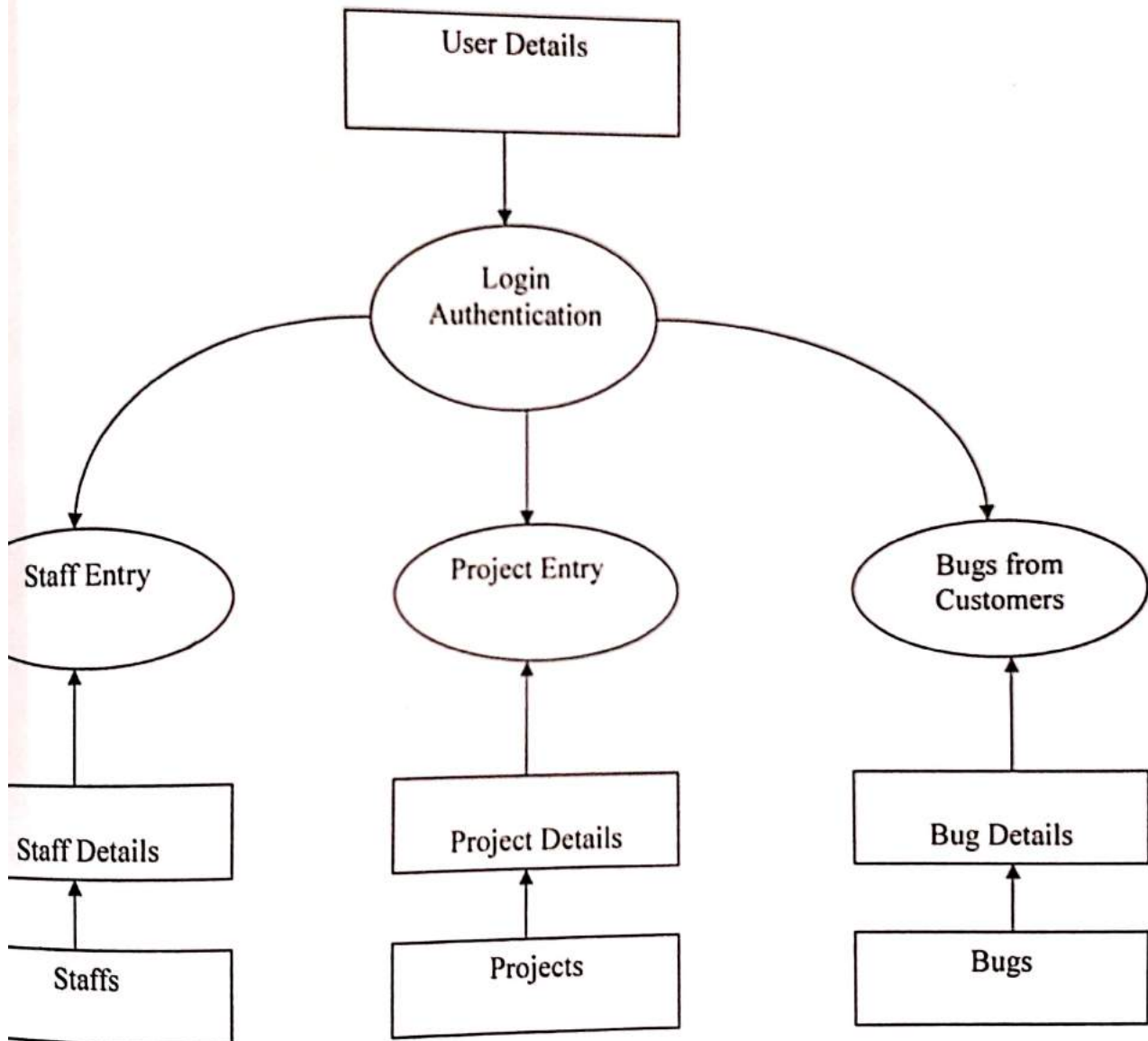
The job and question table is common to all companies. Likewise job apply details are stored in the common 'apply' table. The different users view the data in different format according to the privileges given.

The complete listing of the tables and their fields are provided in the annexure under the title 'Table Structure'.

5.4 DATA FLOW DIAGRAM

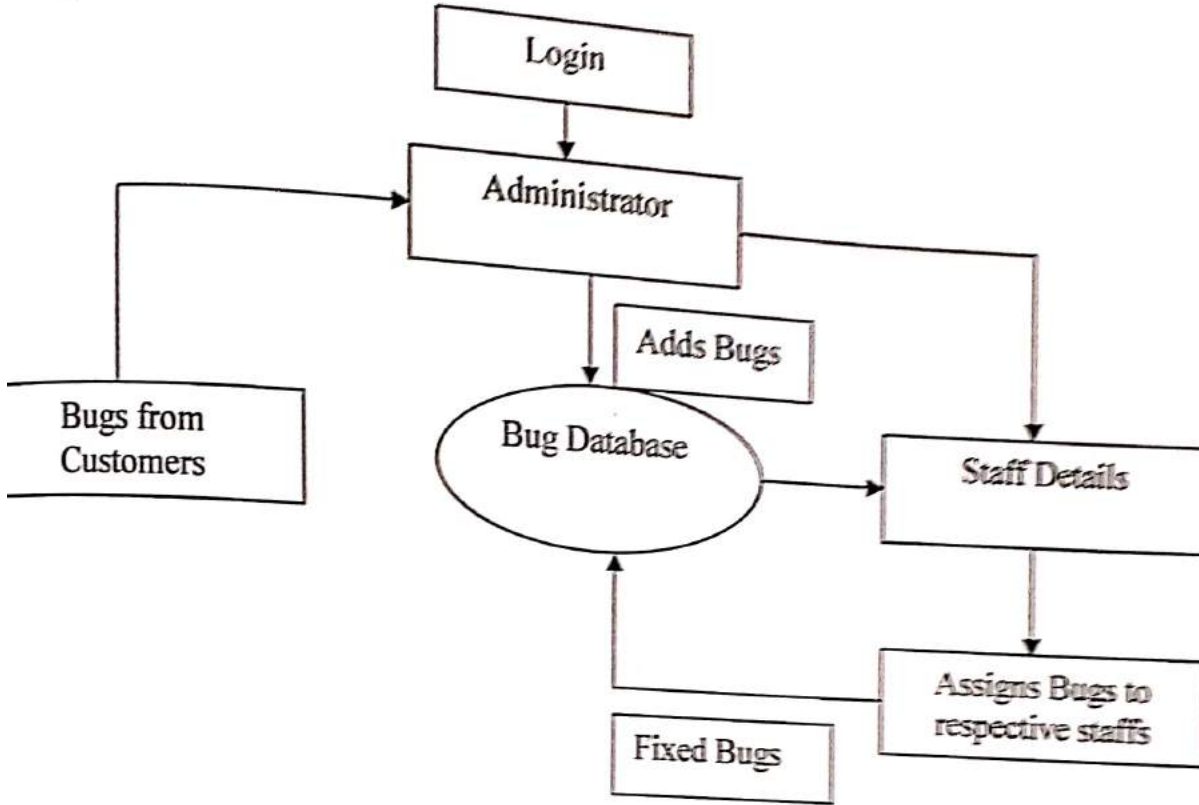
LEVEL 0:

Administrator Module



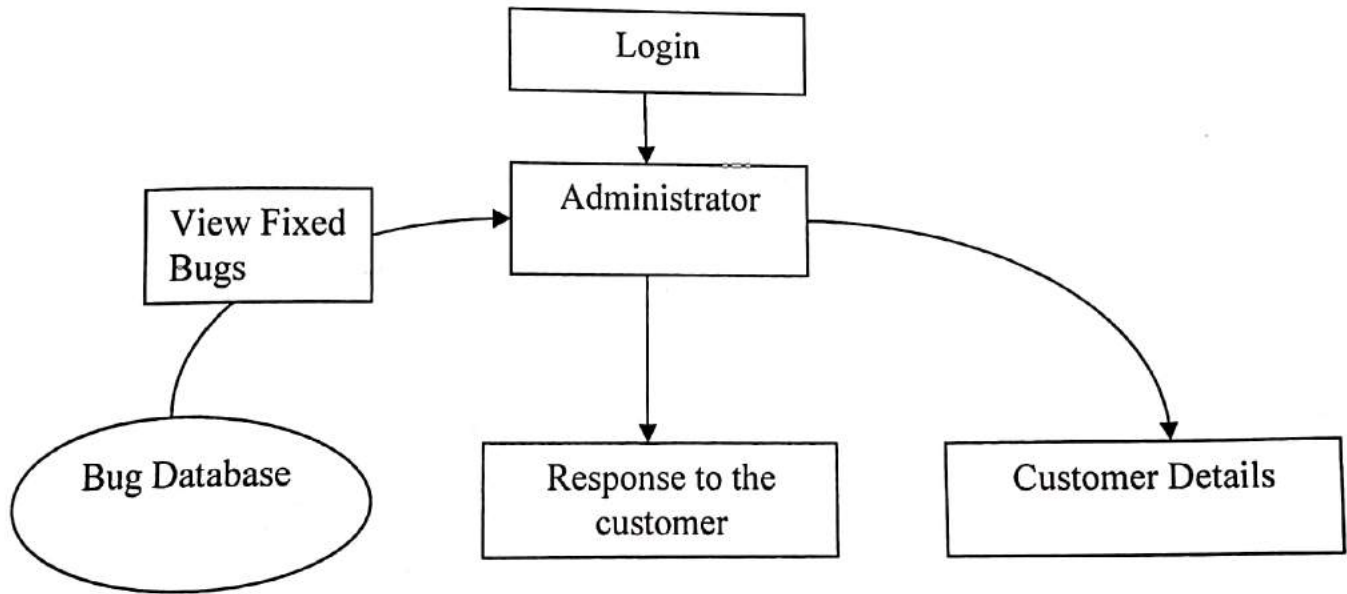
LEVEL 1:

Bug Tracking

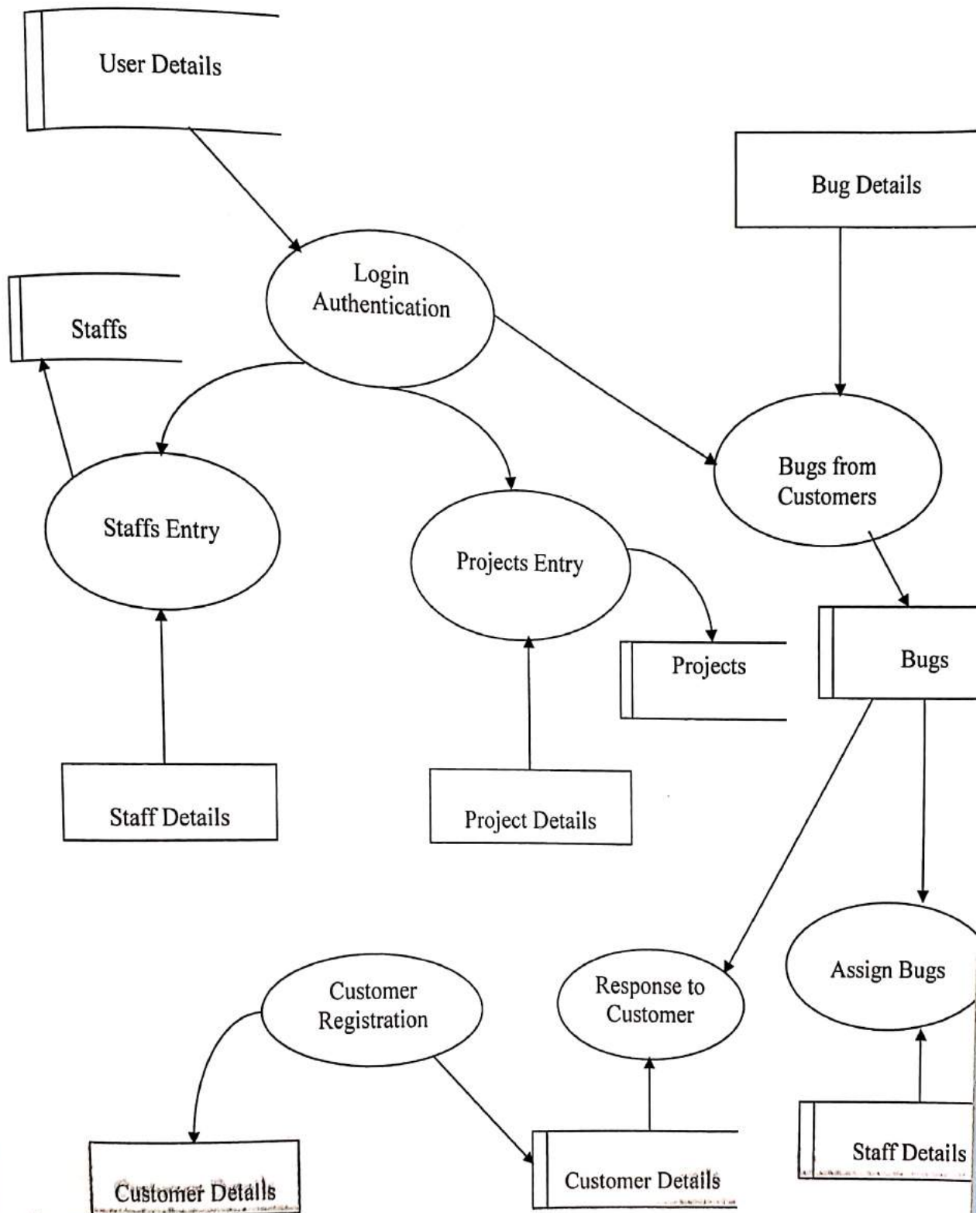


LEVEL 2:

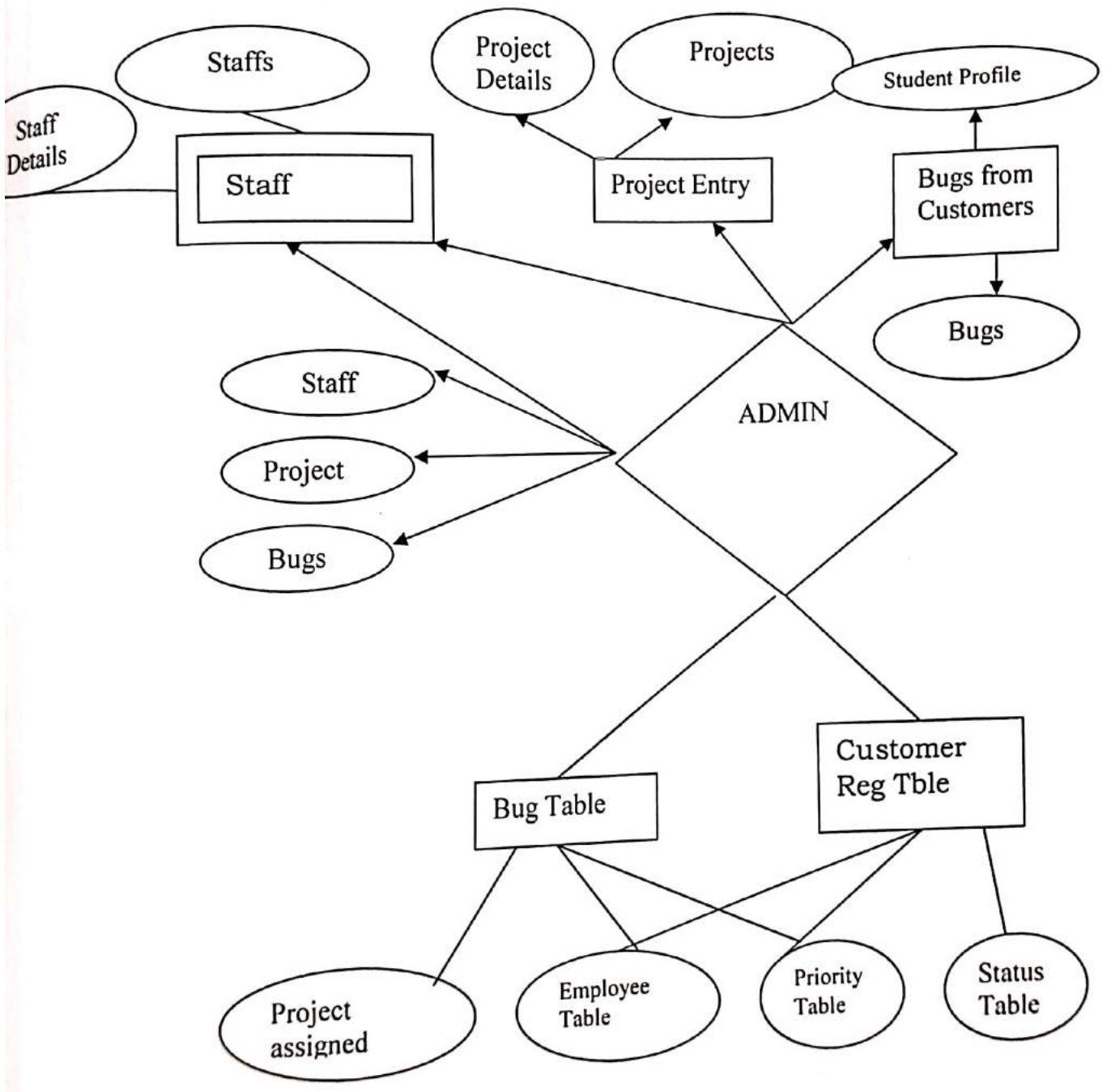
Response to the customer



LEVEL 3:



ER-DIAGRAM



SYSTEM

TESTING

6. SYSTEM TESTING AND MAINTENANCE

6.1 UNIT TESTING:

Unit testing verification efforts on the smallest unit of software design, module. This is known as "Module Testing". The modules are tested separately. This testing is carried out during programming stage itself. In these testing steps, each module is found to be working satisfactorily as regard to the expected output from the module.

6.2 INTEGRATION TESTING:

Integration testing is a systematic technique for constructing tests to uncover error associated within the interface. In the project, all the modules are combined and then the entire programmer is tested as a whole. In the integration-testing step, all the error uncovered is corrected for the next testing steps.

6.3 VALIDATION TESTING:

Validation testing is where requirements established as a part of software requirement analysis is validated against the software that has been constructed This test provides the final assurance that the software meets all functional, behavioral and performance requirements. The errors, which were not uncovered during integration testing, are found out and corrected during this phase.

IMPLEMENTATION

7. SYSTEM IMPLEMENTATION

Implementation is the stage of the project when the theoretical design is turned out into a working system. Thus it can be considered to be the most critical stage in achieving a successful new system and in giving the user, confidence that the new system will work and be effective.

The implementation stage involves careful planning, investigation of the existing system and it's constraints on implementation, designing of methods to achieve changeover and evaluation of changeover methods.

The project is implemented by accessing simultaneously from more than one system and more than one window in one system. The application is implemented in the Internet Information Services 5.0 web server under the Windows 2005 Professional and accessed from various clients.

CONCLUSION

8. CONCLUSION

The "BUG TRACKER" is a complex system involving many sub process. The system overcomes the limitation of existing manual system. This project has been designed, developed and implemented thus providing a full-fledged approach for proficient and best of results. The project satisfies each efficient user for saving his time and also helps him in clearing the bugs and also satisfies various organizations to use their Bug Tracker to recruit bugs.

The Bug Tracker services can be updated with necessary enhancements in the database. The system overhauls the problem in the existing ones by capable of processing voluminous data in a user-friendly manner.

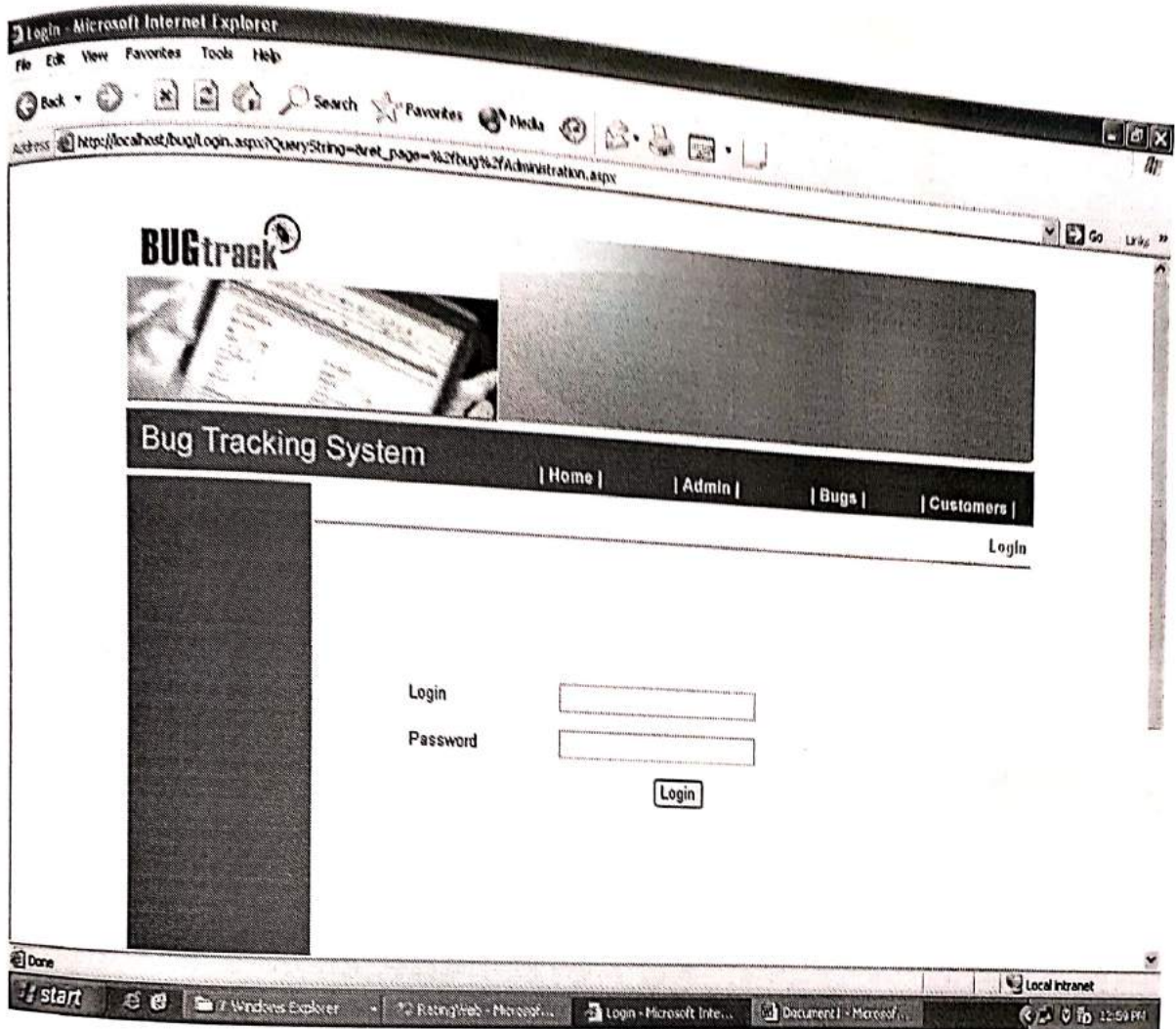
The persons, who are involved in working the task manually, have seen this project running and expressing **satisfaction** about the working procedures and the "conversion handling" incorporated in the project.

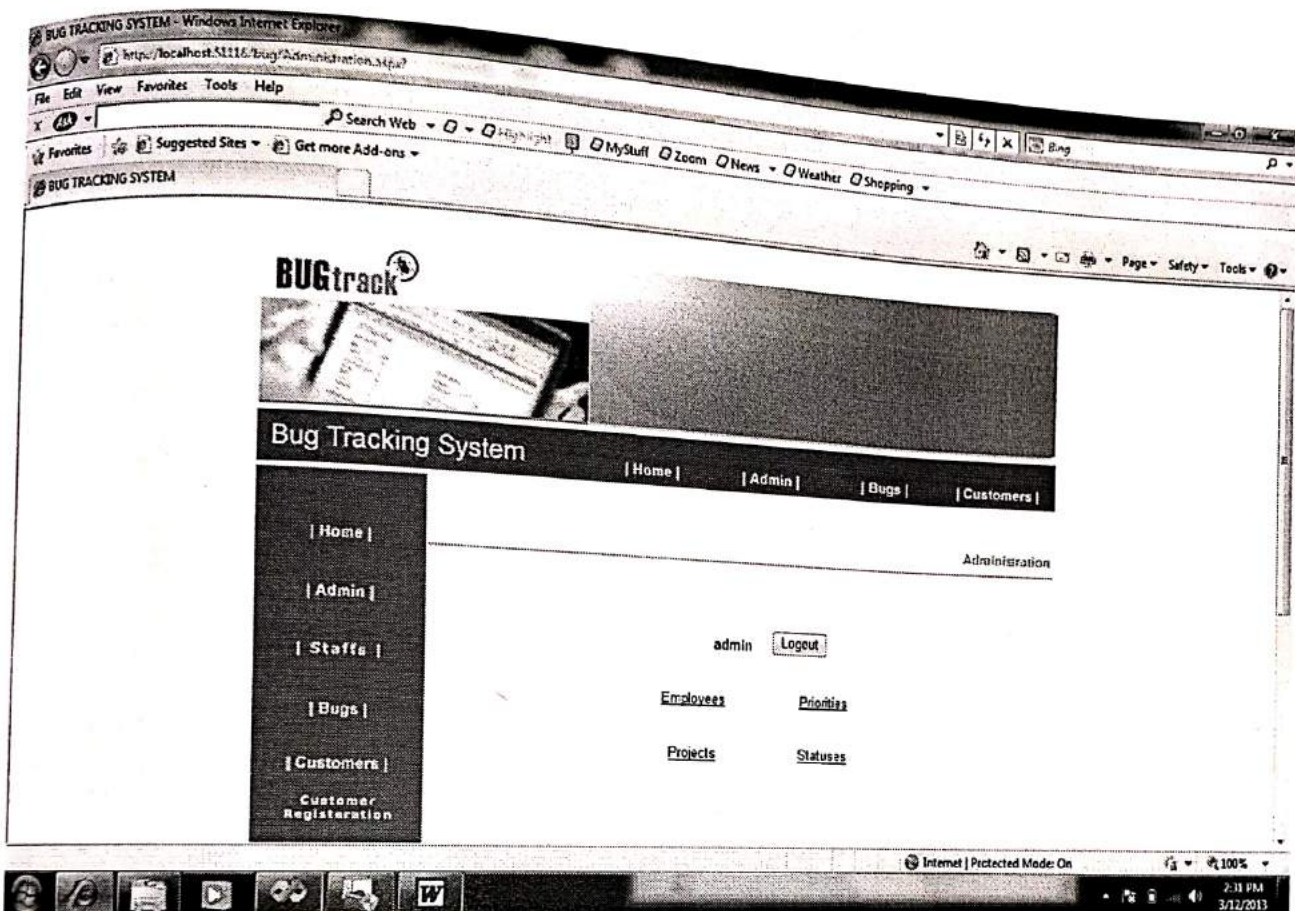
Future enhancements can be made such as issuing user id to the user, where by the user can use that as a reference which specifies all his previous performance, the project work us stopped at this satisfactory level, due to time constraints.

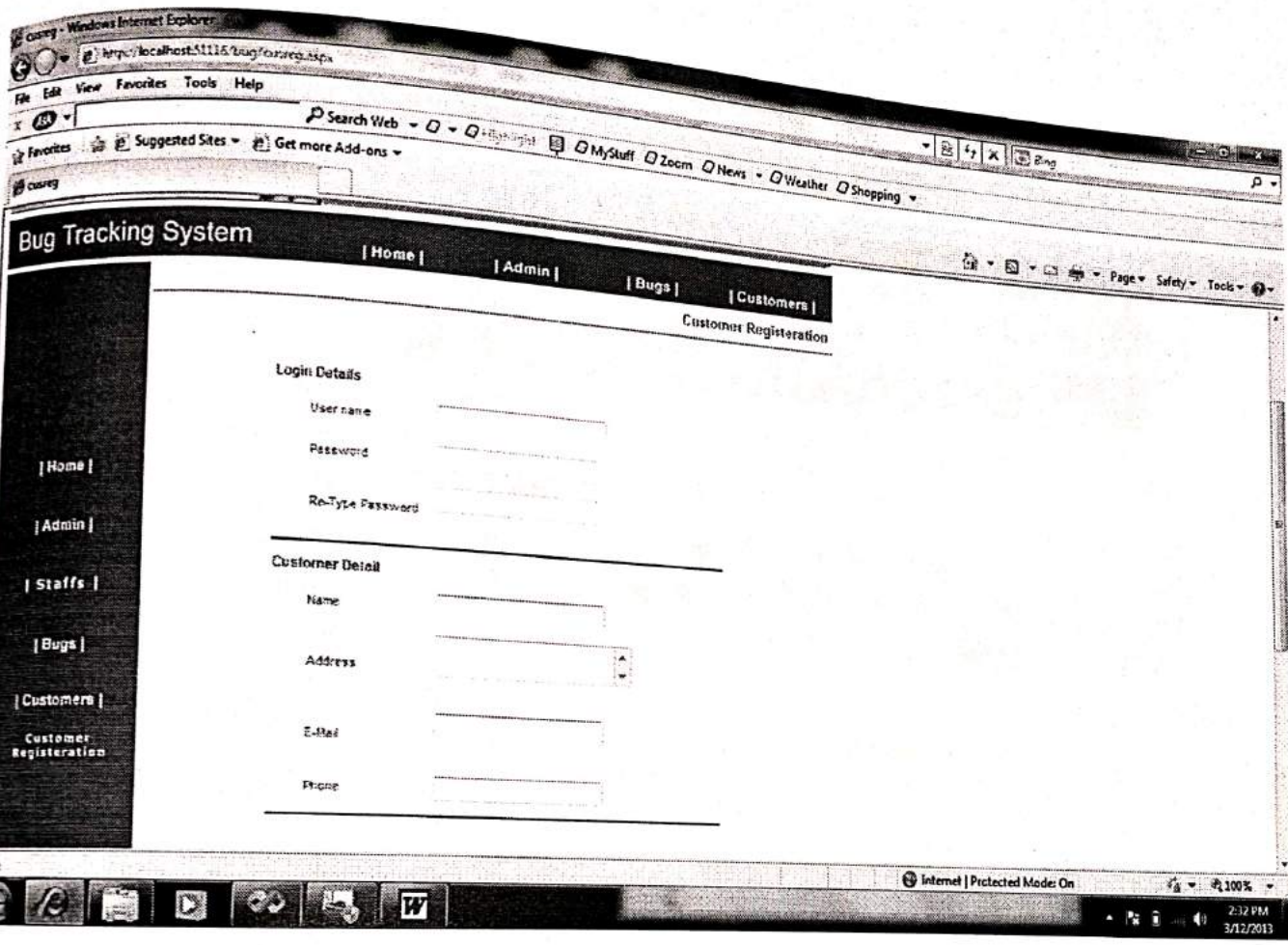
APPENDIX

9. Appendix:

9.1 SCREEN SHOTS:







Bug Tracking System

| Home | | Admin | | Bugs | | Customers |
 Home

Search

Project Assigned To Priority Status

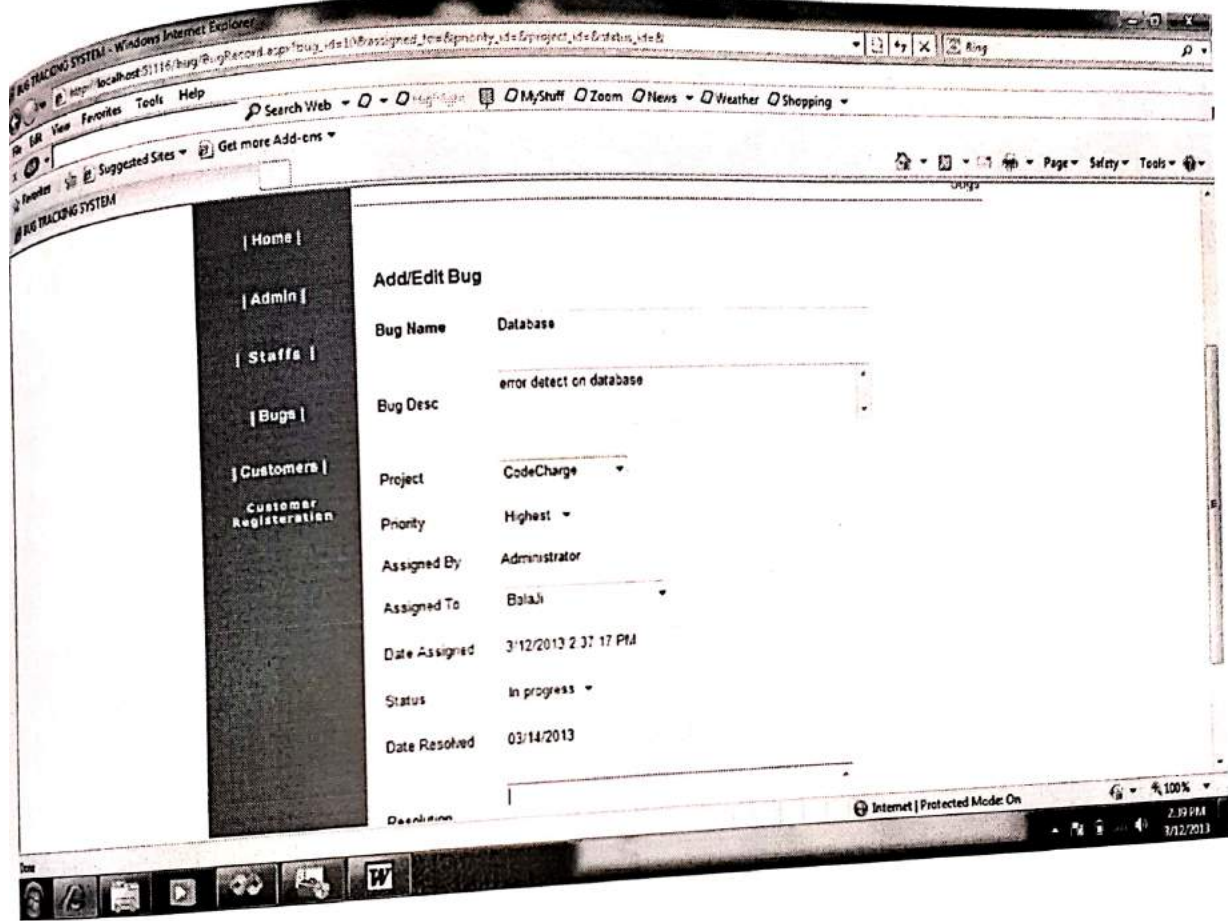
All All All All

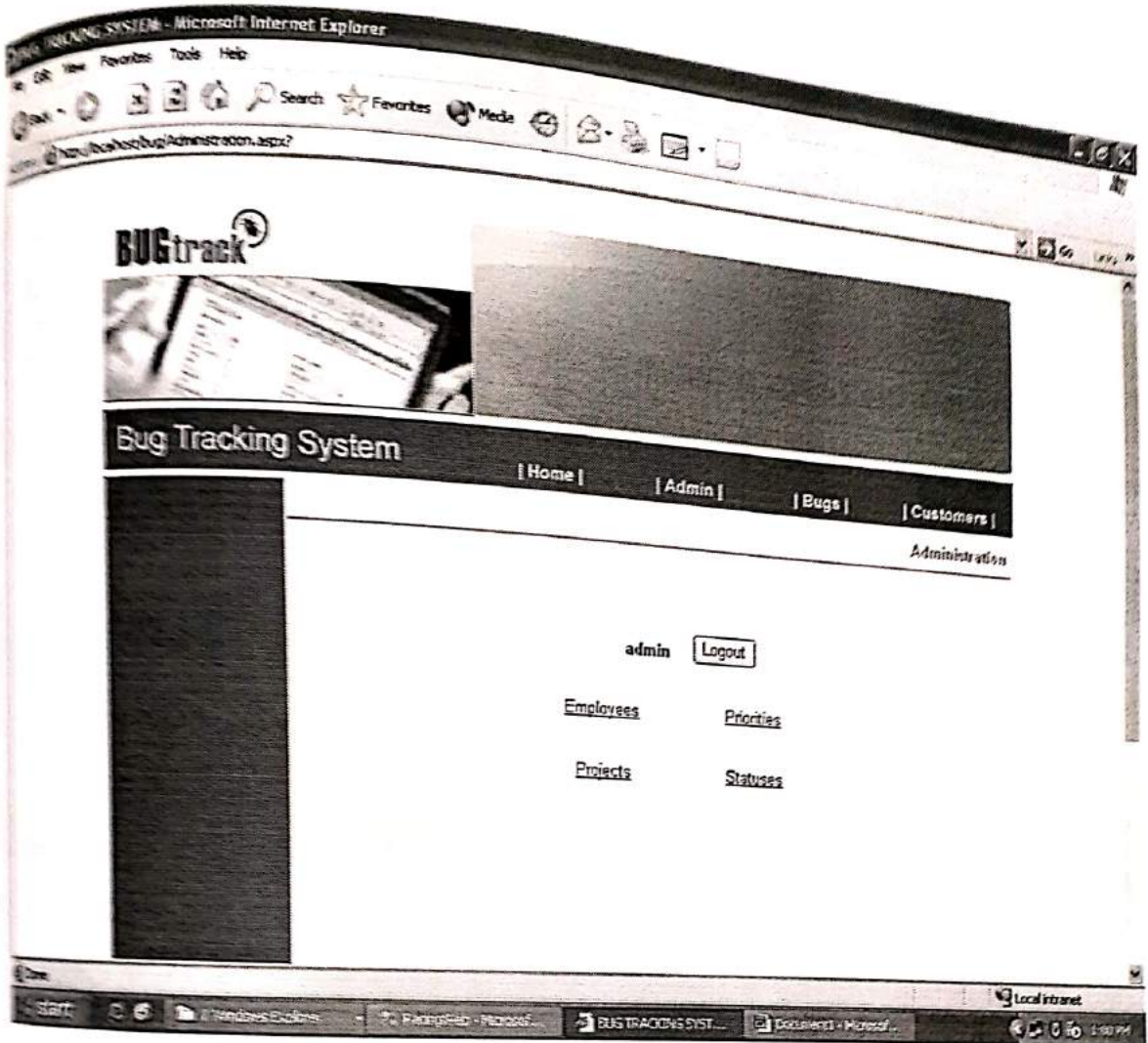
Search

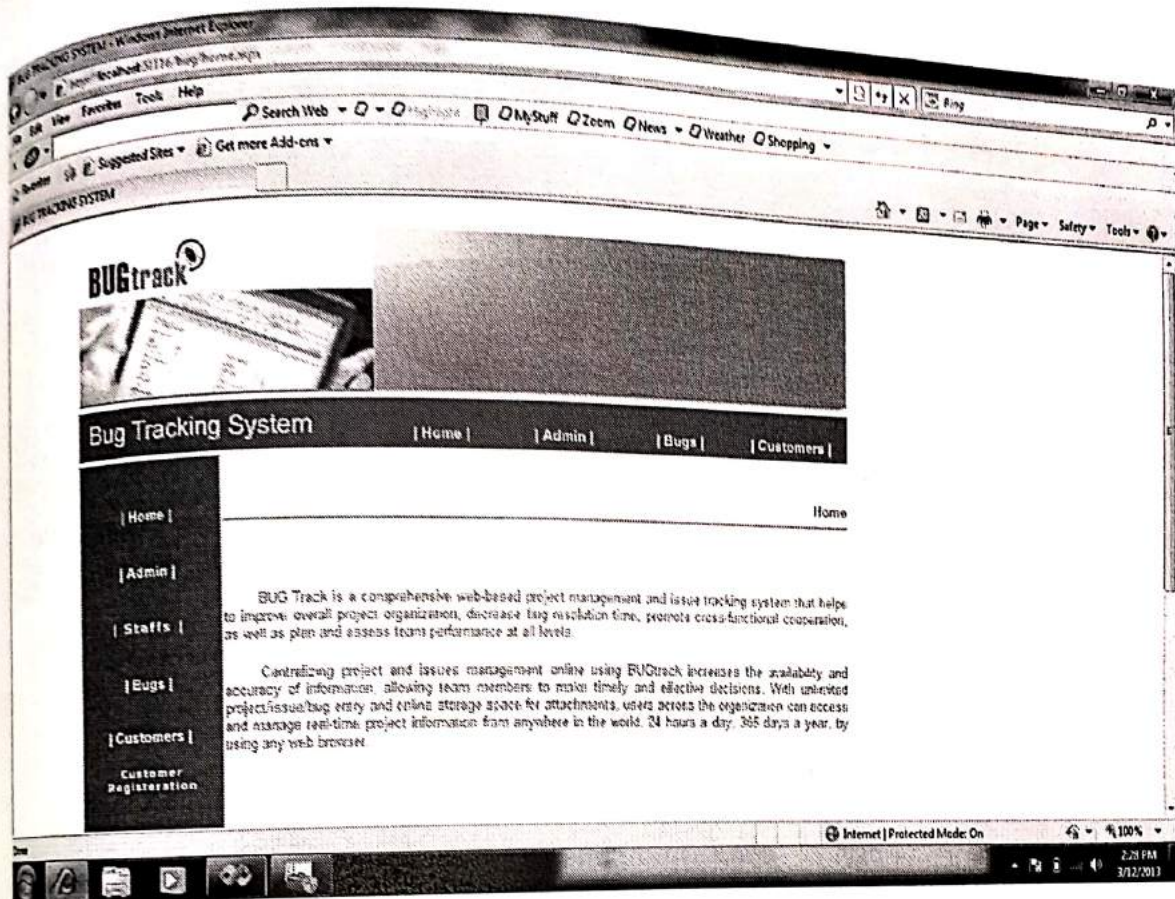
Bugs

Bug #	Bug	Project	Priority	Assigned To	Status
1	Remove ListIOValues	Great Project	High	James Bond	Open
2	Rename URL to Param	CodeCharge	Highest	Balaji	Open
3	Show ADO property page	CodeCharge	High	James Bond	Closed
4	Add: ODBC	My Project	Highest	James Bond	Open
5	Create buttons instead of links	Test Project	High	Thiru Anul	In progress
6	Error during generation	CodeCharge	Highest	Steve Waugh	Open
9	critical error	Super Project	High	Balaji	Open

[Add New Bug](#) Previous [1] Next







9.2 DATA TABLE STRUCTURE:

BUG:

Column Name	Data Type	Length	Allow Nulls
bug_id	int	4	
project_id	int	4	
priority_id	int	4	
status_id	int	4	
bug_name	varchar	100	✓
bug_desc	text	16	✓
resolution	text	16	✓
assigned_by	int	4	
assigned_to	int	4	
date_assigned	datetime	8	✓
date_resolved	datetime	8	✓

CUSTOMREG:

Column Name	Data Type	Length	Allow Nulls
username	varchar	20	✓
pass	varchar	15	✓
repass	varchar	15	✓
name	varchar	20	✓
address	varchar	100	✓
email	varchar	20	✓
phone	varchar	15	✓

EMPLOYEE

Column Name	Data Type	Length	Allow Nulls
employee_id	int	4	
employee_name	varchar	50	✓
login	varchar	15	✓
pass	varchar	15	✓
email	varchar	50	✓
security_level	int	4	✓

9.2 DATA TABLE STRUCTURE:

BUG:

Column Name	Data Type	Length	Allow Nulls
bug_id	int	4	
project_id	int	4	
priority_id	int	4	
status_id	int	4	
bug_name	varchar	100	✓
bug_desc	text	16	✓
resolution	text	16	✓
assigned_by	int	4	
assigned_to	int	4	
date_assigned	datetime	8	✓
date_resolved	datetime	8	✓

CUSTOMREG:

Column Name	Data Type	Length	Allow Nulls
username	varchar	20	✓
pass	varchar	15	✓
repass	varchar	15	✓
name	varchar	20	✓
address	varchar	100	✓
email	varchar	20	✓
phone	varchar	15	✓

EMPLOYEE

Column Name	Data Type	Length	Allow Nulls
employee_id	int	4	
employee_name	varchar	50	✓
login	varchar	15	✓
pass	varchar	15	✓
email	varchar	50	✓
security_level	int	4	✓

9.3 SAMPLE CODING:

```
Imports System.Data.SqlClient
Public Class frmLogin
    Inherits System.Windows.Forms.Form
    #Region " Windows Form Designer generated code "
        Public Sub New()
            MyBase.New()

            'This call is required by the Windows Form Designer.
            InitializeComponent()

            'Add any initialization after the InitializeComponent() call
        End Sub

        'Form overrides dispose to clean up the component list.
        Protected Overrides Sub Dispose(ByVal disposing As Boolean)
            If disposing Then
                If Not (components Is Nothing) Then
                    components.Dispose()
                End If
            End If
            MyBase.Dispose(disposing)
        End Sub

        'Required by the Windows Form Designer
        Private components As System.ComponentModel.IContainer

        'NOTE: The following procedure is required by the Windows Form
        Designer
        'It can be modified using the Windows Form Designer.
        'Do not modify it using the code editor.
        Friend WithEvents Label1 As System.Windows.Forms.Label
        Friend WithEvents Label2 As System.Windows.Forms.Label
        Friend WithEvents Button1 As System.Windows.Forms.Button
        Friend WithEvents Label3 As System.Windows.Forms.Label
        Friend WithEvents Button3 As System.Windows.Forms.Button
        Friend WithEvents Label5 As System.Windows.Forms.Label
        Friend WithEvents txtuname As System.Windows.Forms.TextBox
        Friend WithEvents txtpassword As System.Windows.Forms.TextBox
        <System.Diagnostics.DebuggerStepThrough()> Private Sub
        InitializeComponent()
            Me.Label1 = New System.Windows.Forms.Label
            Me.Label2 = New System.Windows.Forms.Label
            Me.txtuname = New System.Windows.Forms.TextBox
            Me.txtpassword = New System.Windows.Forms.TextBox
            Me.Button1 = New System.Windows.Forms.Button
```

```

Me.Label3 = New System.Windows.Forms.Label
Me.Button3 = New System.Windows.Forms.Button
Me.Label5 = New System.Windows.Forms.Label
Me.SuspendLayout()
,
'Label1
,
Me.Label1.Font = New System.Drawing.Font("Microsoft Sans
Serif", 12.0!, CType((System.Drawing.FontStyle.Bold Or
System.Drawing.FontStyle.Italic), System.Drawing.FontStyle),
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
Me.Label1.Location = New System.Drawing.Point(24, 48)
Me.Label1.Name = "Label1"
Me.Label1.Size = New System.Drawing.Size(112, 23)
Me.Label1.TabIndex = 0
Me.Label1.Text = "UserName"
,
'Label2
,
Me.Label2.Font = New System.Drawing.Font("Microsoft Sans
Serif", 12.0!, CType((System.Drawing.FontStyle.Bold Or
System.Drawing.FontStyle.Italic), System.Drawing.FontStyle),
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
Me.Label2.Location = New System.Drawing.Point(24, 88)
Me.Label2.Name = "Label2"
Me.Label2.Size = New System.Drawing.Size(112, 23)
Me.Label2.TabIndex = 1
Me.Label2.Text = "Password"
,
'txtuname
,
Me.txtuname.Font = New System.Drawing.Font("Microsoft Sans
Serif", 12.0!, System.Drawing.FontStyle.Italic,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
Me.txtuname.Location = New System.Drawing.Point(144, 48)
Me.txtuname.Name = "txtuname"
Me.txtuname.Size = New System.Drawing.Size(120, 26)
Me.txtuname.TabIndex = 0
Me.txtuname.Text = ""
,
'txtpassword
,
Me.txtpassword.Font = New System.Drawing.Font("Microsoft Sans
Serif", 12.0!, System.Drawing.FontStyle.Italic,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
Me.txtpassword.Location = New System.Drawing.Point(144, 88)
Me.txtpassword.Name = "txtpassword"
Me.txtpassword.PasswordChar = Microsoft.VisualBasic.ChrW(42)
Me.txtpassword.Size = New System.Drawing.Size(120, 26)
Me.txtpassword.TabIndex = 1
Me.txtpassword.Text = ""
,
'Button1
,
Me.Button1.BackColor = System.Drawing.Color.PapayaWhip
Me.Button1.Font = New System.Drawing.Font("Microsoft Sans
Serif", 14.0!, CType((System.Drawing.FontStyle.Bold Or

```

```

System.Drawing.FontStyle.Italic), System.Drawing.FontStyle),
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
Me.Button1.ForeColor = System.Drawing.Color.Blue
Me.Button1.Location = New System.Drawing.Point(194, 136)
Me.Button1.Name = "Button1"
Me.Button1.Size = New System.Drawing.Size(75, 32)
Me.Button1.TabIndex = 3
Me.Button1.Text = "E&xit"
'
'Label3
'
Me.Label3.BackColor = System.Drawing.Color.Transparent
Me.Label3.Font = New System.Drawing.Font("Microsoft Sans
Serif", 20.0!, System.Drawing.FontStyle.Bold,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
Me.Label3.Location = New System.Drawing.Point(0, 0)
Me.Label3.Name = "Label3"
Me.Label3.Size = New System.Drawing.Size(352, 32)
Me.Label3.TabIndex = 6
Me.Label3.Text = "Tax Login Form"
Me.Label3.TextAlign =
System.Drawing.ContentAlignment.MiddleCenter
'
'Button3
'
Me.Button3.BackColor = System.Drawing.Color.PapayaWhip
Me.Button3.Font = New System.Drawing.Font("Microsoft Sans
Serif", 14.0!, CType((System.Drawing.FontStyle.Bold Or
System.Drawing.FontStyle.Italic), System.Drawing.FontStyle),
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
Me.Button3.ForeColor = System.Drawing.Color.Blue
Me.Button3.Location = New System.Drawing.Point(89, 136)
Me.Button3.Name = "Button3"
Me.Button3.Size = New System.Drawing.Size(71, 32)
Me.Button3.TabIndex = 2
Me.Button3.Text = "&Login"
'
'Label5
'
Me.Label5.BackColor = System.Drawing.Color.Transparent
Me.Label5.Location = New System.Drawing.Point(0, 128)
Me.Label5.Name = "Label5"
Me.Label5.Size = New System.Drawing.Size(352, 48)
Me.Label5.TabIndex = 13
'
'frmLogin
'
Me.AutoScaleBaseSize = New System.Drawing.Size(5, 13)
Me.BackColor = System.Drawing.Color.FromArgb(CType(192, Byte),
CType(255, Byte), CType(192, Byte))
Me.ClientSize = New System.Drawing.Size(338, 173)
Me.Controls.Add(Me.Button3)
Me.Controls.Add(Me.Label3)
Me.Controls.Add(Me.Button1)
Me.Controls.Add(Me.txtpassword)
Me.Controls.Add(Me.txtuname)
Me.Controls.Add(Me.Label2)

```

```

        Me.Controls.Add(Me.Label1)
        Me.Controls.Add(Me.Label5)
        Me.FormBorderStyle =
System.Windows.Forms.FormBorderStyle.FixedSingle
        Me.MaximizeBox = False
        Me.MinimizeBox = False
        Me.Name = "frmLogin"
        Me.StartPosition =
System.Windows.Forms.FormStartPosition.CenterScreen
        Me.Text = "Tax Login Form"
        Me.ResumeLayout(False)

```

```
End Sub
```

```
#End Region
```

```

Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button1.Click
    End
End Sub

```

```

Private Sub Button3_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button3.Click

```

```

    Try
        If con.State <> ConnectionState.Open Then con.Open()
        cmd.CommandText = "Select count(*) From Users Where
UserName='" & txtuname.Text & "' and [Password]=''" & txtpassword.Text &
""

```

```

        If cmd.ExecuteNonQuery > 0 Then
            cmd.CommandText = "Select count(*) From Users Where
UserName='" & txtuname.Text & "' and [Password]=''" & txtpassword.Text &
""

```

```

                LoggedUser = txtuname.Text
                loginsucceed = True
                Me.Close()

```

```

            Else
                MsgBox("Invalid User...", MsgBoxStyle.Critical)
            End If

```

```

        Catch ex As Exception
            MsgBox(ex.Message.ToString, MsgBoxStyle.Critical)
        Finally
            con.Close()

```

```

    End Try
End Sub

```

```

Private Sub frmLogin_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load

```

```

    End Sub
End Class

```

BIBLIOGRAPHY

10. BIBLIOGRAPHY

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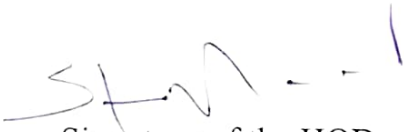
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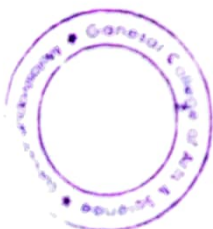
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**REALITY VERSUS ILLUSION – RAJA RAO'S
THE SERPENT AND THE ROPE**

Project Report Submitted to **BHARATHIDASAN UNIVERSITY,
THIRUCHIRAPALLI**

In partial fulfillment of the requirement for the degree of
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DECLARATION

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A.DEVAGI

TEXTUAL NOTE

Reference details have been given within parenthesis as per the rules found in the MLA Hand Book .

The following abbreviation have been used in the text for the questions taken from the Primary Source .

The Serpent and the Rope - SR

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CHAPTER-I

INTRODUCTION

English literature means different things in different contexts. Literature comes from the Latin word 'literal' which means 'acquainted with letter'. Generally, literature refers to different types of text including novels, non-fiction, poetry and plays among other forms. However, Literature is a contested term, as new mediums for communication provided different types of contemporary literature. At the college or graduate level, English literature tends to refer to British literature. English literature, the body of written works produced in the English language by inhabitants of the British Isles from the 7th century to the present day.

Though India was under British rule, still, English was adopted by the Indians as a language of understanding and awareness. Education and literary expression with an important means of communication among various people of dissimilar religions. Indian English literature, quite understandably spurs attention from every quarter of the country, making the genre admired in its own right, creative writing in English is looked at as an integral part of the literary traditions in Indian perspective of fine arts.

Indian literature refers to the literature produced on the Indian sub-continent until 1947 and in the Republic of Indian. The Republic of Indian has 22 officially recognized languages. The earliest works of Indian literature were orally transmitted. Sanskrit literature begins with the oral literature oral literature of the Rig Veda a collection of sacred hymns dating to the period 1500-1200 BCE. The Sanskrit epics **Ramayana** and **Mahabharatha** appeared towards the end of the 2nd millennium BCE. Classical Sanskrit literature developed rapidly during the first few centuries of the millennium BCE, as did the Tamil Sangam literature, and pali canon. In the medieval period, literature in Kannada and Telugu appeared in the 9th and 11th centuries respectively. Later literature in Marathi, Odia, and Bengali appeared.

Thereafter literature in various dialects of Hindu, Persian and Urdu began to appear as well. Early in the 20th century, Bengali poet **Rabindranath Tagore** became Indians first Noble laureate. In contemporary Indian literature, there are two major literary awards; these are the **Sahitya Akademi** fellowship and the Janpath Awards each have been award in Hindi and Kannada, followed by five in Bengali; and Malayalam, four in Odia, four in Gujarati, Marathi, Telugu and Urdu two each in Assamese and Tamil and one in Sanskrit.

Original writing in English by Indians or Indian theme has been called Indian English literature or Indo-Anglian literature by different critics. The authors may be Indian by birth or ancestry or nationality. The term Indo-Anglian was coined by **J.H Cousins**. But many critics like **M.K Naik** say that it is not happy expression. It suggest a relation between Indian and England and not a relation between Indian and the English language. They prefer to call it Indian English literature.

Indian writing in English or Indo-Anglian literature is refers to the body of work by writers in India who write in English language and whose native or co-native language could be one of the numerous language of India. It is associated with the work of members of the Indian diaspora, such as **V.S Naipaul**, **Kiran Desai**, **JumbaLahiri** who are of Indian descent. As a category, this production comes under the broader realm of postcolonial literature. The production from previously colonized such as India.

The major theme of the Indo-Anglian fiction have been the presentation of the social problem, happiness through suffering, politics and confrontation between East and West. The Indo-Anglian fiction opens out a strange exotic field of racial inter-mixture and mutual impact of two culture rooted in two entirely different background; one very ancient and conservatives, the other moderns, scientific and progressive; the one surrounding to the supernatural destiny or the theory of '**Karma**' the other trying to make the worst of circumstance.

Indian writing in English has commanded unstained admiration in both home and abroad is now in its full swing. It has carved out a new vision—a vision that is replete with an answering faith and hope, myths and traditions, customs and rites etc. Indian English literature is two hundred years old. **Sir Aurobindo** stands like a huge oak spreading its branches over these two centuries.

India's substantial contribution to world literature is largely due to the perfect creation literary, works generated by Indian novelists in English. Their works contemplated and deliberated on a multifarious range of issues like nationalism, freedom struggle, social realism and individual consciousness. This literary movement being fortified by the overwhelming output by novelists and distinguished itself as a remarkable force in world fiction. One problem which the Indo-Anglian novelist faces all the time is the problem of language. English is after all, an alien medium. He must mould it in such a way as to convey the impression that his characters, his situation and the entire environment are Indian. He has to create impression of Indian life while all his characters are talking in English. The language should be flexible enough to suit different characters and should be a suitable medium for the expression of the thoughts and feeling of our countrymen.

Indian writing in English is a product of the historical encounter between the two cultures—Indian and western—for about one hundred years and ninety years. Indian English literature refers to the body of works by authors in India who write in English and whose native or co-native language could be one of numerous languages of India. Indians have been writing in English for communicating with one another, and with the outside world, for self-expression and for creative writing in English.

Indian English literature is honest enterprise to demonstrate the ever rare gems of Indian writing in English. From being a singular exceptional, rather gradual native flare-up of geniuses, Indian writing has turned out to be a new form of Indian culture and voice in which India converses regularly. Indian writers, poets, novelist, essayist and dramatist have been making mass and considerable contributions to world literature since pre-independence era, the fast few years have witnessed a gigantic prospering and thriving of Indian writing in the global market.

Indian writing in English is written about the Indian subject, the setting is basically Indian rural and urban place and it presents a variety of cultures of India, use of Indian English, and basically expresses Indian feeling and emotions. The early writers of Indian writing in English includes **Henry Dorazio**, **Rabindranath Tagore**, **Bankimchandra**, **Aurobindo Ghosh**, **Nirad Chaudhari**, **Sarojini Naidu**, **Toru Dutt**, **R.T Narayan**, **Raja Rao**, **Mulkraj Anand**, **Malgownkar** etc.

Indian English literature has attained an independent status in the realm of world literature. Wide ranges of themes are dealt with in Indian writing in English. While this literature continues to reflect Indian culture, tradition, social values and even Indian history through the depiction of life in India and Indians living elsewhere, recent Indian English fiction has been trying to give expression to the Indian experience of the modern predicaments. There are critics and commentators in England and America who appreciate Indian English novels. Prof. M.K.Naik remarks one of the most notable gifts of English education to India is prose fiction for through India was probably a fountainhead of story-telling, the novel as we know today was an importation from the west.

Rabindranath Tagore 1861-1941 is celebrated name in the sphere of English literature. He won noble prize for literature in 1913, for his immortal poetic work **Gitanjali**. Besides being a great universal poet, the genius Tagore is also a novelist, dramatist, short story writer, musician, philosopher, painter, educationalist, reformer and critic in every field and had earned a

niche for himself. The setting of his novel is representative and reflective, their character is natural, realistic, full-blooded and lifelike.

Indian English is early history began with the works of **Michael madhusudan Dutt** followed by **R. K. Narayan, Mulk Raj Anand and Raja Rao** who contributed to Indian fiction in 1930s. It is also associated with the works of Indian diaspora who were of Indian descent. There were poets who are considered the first of the Indian English poets, **Henry Vivian Derozio, Madhusudan Dutt, Aru and Toru Dutt, and Manmohan Ghose.**

The first writer who wrote proper novels was **Ramesh Chander Dutt**. He wrote his novel in Bengali but some of his novels were translated into English. His **Slave Girl of Agra** (1909) is a historical romance of the time of the Mughul rules of India whose capital was Agra. The next writer who deserves our consideration is **Bankim Chandra Chatterji**. He was a powerful novelist. He gives a realist picture of the social and political life of Bengali in the 19th century. He specially shows the miserable condition of women in Hindu society. His novels have been translated into all principle language of India and some of them have been turned into popular movies.

The Indian English fiction has had meteoritic growth during the dawn of the millennium year and the writing in all genres of literature has gain momentum, particularly the Indian novel, the doyens of the Indian writing **R. K. Narayan, Mulk Raj Anand, Raja Rao** and they like to promote the conventional mode of writing. The crusaders of the contemporary and modern era include **Salmon Rushdie, Amitha Ghosh, Vikram Seth** and many more. They elucidate and substantiate strength of the emerging modern India, which has the vibrancy and energy of a gushing artesian along with an matched resolve to experiment and explore new avenues of writing novel.

Pre-Independent India also produced a number of novels involving the causes and aftermaths of the freedom movement. The novels that belong to this category include **Nayantara Saghal's A Time to be Happy 1952**, **Khwaja Ahmed Abbas' Inquilab 1955**, **R. K. Narayan's Waiting for the Mahatma 1955** etc. The triumvirs **Mulk Raj Anand**, **R. K. Narayan** and **Raja Rao** were the novelist who stabilized and fortified the Indian English fiction with their ample works and unique literary style.

The most significant event in the history of Indian English fiction in the 1930s was the appearance on the scene of its major triumvirs **Mulk Raj Anand**, **R. K. Narayan** and **Raja Rao** whose first novel were published in 1935 and 1938 respectively. It is the mark of their stature that they revealed, each in his own characteristic way, the various possibilities of Indian English fiction. **Mulk Raj Anand**, the eldest of the three, has also been the most prolific writer.

Mulk Raj Anand was born in 1905 in a Hindu family. He was educated in Lahore, London and Cambridge. He earned a Doctorate in philosophy. The majority of Anand's novel brings to the limelight inequalities of society and trials and tribulation of the less fortunate. **Untouchable 1935**, **Coolie 1936**, **The Village 1939** and **The Private Life of an Indian prince 1953** addresses the evils existing the society in the Marxist terms. His novels also give graphic description of the daily existence of his character, their toe of woe, sweat and misery. **Untouchable** targets the evils of casteism and brings to the surface issue of segregation of people on the basis of their profession. In **Coolie**, he presents a poverty-stricken protagonist, Munoo who portrays the hollowness of the society and the curse faced by the proletariat. He was instrumental in bringing about an awareness of the inequality that existed in India. He also advocated solution for the issues.

A most consistently satisfying artist, **R.K.Narayan** who enjoyed a unique position in the crowded literary scene of Indian fiction. His first novel **Swami and Friends**, published in 1935, deals with the happy world of young school boys. His next novel **Bachelor for Arts**

(1937), depicts the college life in south India, with a touch of caricature here and there. In his third novel **The Dark Room** (1938), Narayan artistically portrays the family tangles of a middle class south Indian home. His other novel are: Mr.Sampath (1949), The Financial Expert (1952), The Guide (1958), many of his novels have been translated into many foreign language.

Sir Ahmed Salman Rushdie was born on 19 June 1947 and brought up in Bombay and later went to England for higher education. Thus, his education in a foreign country, has played a stupendous role in shaping the mind of this writer. In 1975, Rushdie published his first novel **Grimus**, a science fiction story inspired by the 12th century sufi poem "**The Conference of the Birds**", won the Booker prize in 1981 and was deemed to be "the best novel of all winner". His third novel, **Shame 1981**, was commonly regarded as political allegory of Pakistani politics. The language, style, theme and narrative technique employed by Rushdie are highly innovative.

Vikram Seth is an Indian novelist, poet and travel writer. He has received several awards such as **Padma Shri, sahitya Academy Award, Pravas Bharatiya samman Award** etc. He is best known for his epic novel '**A Suitable Novel**' is published in 1993. The novel follows the story of four families over period 18 months. Seth delves in detail on the social milieu of post-independence India. He has been regarded as one of the most influential writers of the modern era. His another novel '**The Golden Gate**' published in 1986 made him one of the most highly acclaimed novelists of his time and the book won plenty of accolade from the reader as well as critics.

Amitav Ghosh is an Indian writer, best known for his English language historical fiction. He won the 54th **Jnanpith award** in 2018. India's highest literary honor. Ghosh ambitious novels use complex narrative strategies to probe the nature of national and personal identity, particularly about the people of India. He has also written non-fiction work discussing topics such as colonialism and climate change. He worked at Indian Express newspaper. His popular

works are **The Circle of Reason (1986)**, **The Shadow Line (1988)**, **The Calcutta Chromosome (1995)**, **The Hungry Tide (2004)**, etc.

Raja Rao was born on 5th of November, 1908, in the village of Hassana in the former Mysore state, in an orthodox Brahmin family. The family consisted of scholar and philosopher. Among his ancestor was vidyanaya swamy who was perhaps the greatest Advaita philosophy after sankaracharya. His father was a professor of Canarese at Hyderabad. He learnt religion and philosophy from his grandfather at an early age. He was sent to Aligarh Muslim University for higher education. There he met Dickinson who created him an interest in French language and literature. He came back to Nizam college, Hyderabad and took his degree from there. He was awarded a scholarship by the Hyderabad state to go to France for the higher study of French literature.

Raja Rao went to France when he was only about twenty years old. He first studied at university of Montpellier and then he started doing research work under great scholar and literary. He lived in France from 1928 to 1939. He married Camille Mouilly in 1929, who taught French at Montpellier. This marriage lasted until 1939. Raja published his first stories in French and English. During 1931-1932 he contributed four articles written in Kannada for Jaya Karnataka, an influential journal.

Raja Rao visited India in 1933 and lived for some time in Pandi Taranath's ashram at Tungabhadra. His first novel *Kanthapura* was published in 1938. He came to India again 1940 after the outbreak of the Second World War. He was deeply interested in Indian philosophy and religion. He visited Ramana Maharshi at Tiruvannamalai and Narayan Maharshi at kedgaon. He went to Benares and became so much interest in the religious activities. He was saved from this course by Swami Atmanada who convinced him that a person could attain salvation by meditating on God and carrying on his duties as a man. Raja Rao took him as his guru.

Rao's involvement in the nationalist movement is reflected in his first two books. The novel *Kanthapura* was an account of the impact of Gandhi's teaching on non-violent resistance against the British. The story is seen from the perspective of a small Mysore village in South India. Rao borrows the style and structure from Indian vernacular tales and folk epic. Rao returned to the theme of Gandhism in the short story collection *The Cow of the Barricades* in 1947.

In 1960 appeared his great novel, *The Serpent and the Rope*, was written after a long silence during which Raja Rao returned to India. The work dramatized the relationship between Indian and Western culture. This novel is autobiographical in spirit. Later he depicted the breakdown of their marriage in *The Serpent and The Rope*. In 1965, Rao married Katherine Jones, an American stage actress. They had one son, Christopher Rama. In 1986 after his divorce from Katherine, Rao married a third wife, Susan Vaught whom he met when she was a student at the university of Texas in the 1970s.

Rao was fascinated by the American culture and way of life. Rao looked up America as a brave, new world and said; "America has great splendour. Once this nation itself, it will be truly magnificent". His American writers were the philosophers whose transcendentalism and oriental learning entered them to him. They were Emerson, Thoreau and Walt Whitman. These thinkers and writers were all so interested in vedantic philosophy and so they charmed Raja Rao. He also fascinated by the dynamic young Americans who, he was certain, would usher in an inner revolution in the world. Like Tagore, Rao also tended to see the brighter side of the materialism of the west. He regarded the American intellectual deeply committed to the search of philosophical truth.

He became philosopher of both Buddhist and Vedantic philosophy at prize for literature. In 1998 he published Gandhi's biography *Great Indian Way; A Life Mahatma Gandhi*. Rao was died of heart failure on 8 July 2006, at his home in Austin, Texas, at the age of 97. Raja Rao

started his writing career in Kannada, he has proved himself to be a great writer in English. He has written many novels such as **Kanthapura 1938, The Serpent and The Rope 1960, The Cat and Shakespeare 1965, Again Visited Indian 1968, Comred Kirillov 1976, The Policeman and The Rose 1978** etc.

Rao's first and best novel, **kanthapura 1938**, is the story of a south Indian village named kanthapura. The novel is narrated form of a Sthala Purana by an old women of the village, Achakka. Regarded as the first major Indian novel in English, kanthapura is the story of how **Gandhi's struggle for independence** came to a casteist south Indian village. Young, Moorthy back from the city, brimming with new ideas, seeks to cut across ancient barriers and unite the villagers in non-violent action. The story emerges through the eyes of delightful old women, who comments on the villager's actions with sharp-eyed wisdom, evoking the spirit of India's traditional folk epics. Kanthapura is not merely an account of the fight of a slave against his master. It is a comprehensive picture of the fight between good and evil. It is the story of collective action, heroism and suffering caused to the people by their enemies from within and without.

The Cat and Shakespeare was published in 1965. Rao has called it "philosophical comedy" and also described as a 'metaphysical comedy'. It is more of a fantasy with a lot of philosophical discussion which are not always assimilated in the main body of the story. The cat links the novel to the Indian beast fables and Nair's comic roguery shows similarities to rogue fables in the Panchatantra. It is the story of two friends Govindan Nair and Rama Krishna Pal deals with corruption in the rationing department. Here Rao shows a wonderful comment over the English language. It is full of symbolism. This novel brings alive the raw texture of Indian life in Trivandrum and delights in its humor.

Rao's **Comrade Kririllov** appeared in French in 1976 and generally recognized as Rao's least ambitious novel. The title of the story reflects the name of central character of the

stroy Kirillov is a South Indian Brahmin whose real name is Padmanabha Iyer. He changes his name when he comes under the influence of Russian communism. The novel is narrated by Rama, the reporter for the 'Hindu' in England. When the second world war starts and communist Russia seems to be triumphing, Kirillov is so happy that he marries Czechoslovak girl who was a thorough communist. They have a son, Kaml, who later comes to India, stays with Kirillov's family and visits all the important places in South India with the narrator.

Rao's **The Chessmater and His Moves** is most ambitious novel and published in 1988. It was the first volume of a trilogy expressed in a style. Rao tried to explain the game of chess with life. In this novel Rao used the metaphor of the chess game to animate philosophical and psychological idea. It is the story of impossible love between Sivarama Sastri and Indian mathematical work in Paris and a married woman. It is full of uncertainty with no ending and can only end in sorrow desperation.

Rao's second and great novel, *The Serpent and The Rope*. It was published in 1960 and recipient of the **Sahitya Akademi Award** in 1964. It sometimes called Rao's **spiritual autobiography**. This novel explores the theme of reality, existence and self-realization. Throughout the novel, protagonist Ramaswamy's thought process develops in line with Vedantic in philosophy. A part of the action takes place in India and the rest of it on the Continent, in England and France. The novel tells the story of Rama and particularly his marriage while reflecting on flavor and tradition of India. . The theme of the novel is a study of that encounter. The novel is also regarded as the spiritual autobiography of Raja Rao. Indeed *The Serpent and the Rope* is Raja Rao's Mahabharata and it presents his vision of India which is only reality in the world. The title itself is in the form of symbols. The serpent stands for illusion and the rope stands for reality or truth. The Serpent and the Rope symbols taken from the Advaita or non-dualistic philosophy of sankaracharya.

This chapter formed the introduction. The second chapter explains the reality versus illusion in Raja Rao's THE SERPENT AND THE ROPE. Chapter third forms the conclusion.

CHAPTER II

REALITY VERSUS ILLUSION IN - RAJA RAO'S THE SERPENT AND THE ROPE

Raja Rao's second novel, *The Serpent and the Rope*. Raja Rao has given a very appropriate and suggestive title to this novel. It suggests the main theme of the novel which is the antithesis between appearance and reality. The novel is also regarded as the spiritual semi-autobiography of Raja Rao. He himself narrate the story of his life in the first person. The name of the hero is R.Ramaswamy but he is known throughout by his abbreviated name, Rama.

The *Serpent and the Rope* metaphysical insofar as it explore the nature of spiritual and metaphysical quest in some of its complex meaning and attempts rare synthesis of the culture of India and Europe. Rao is in a propitious position to mediate between the two. Realizing that our ultimate aim of life on Earth is not Just social or religious but also metaphysical. Rao communicates his ideas in the novel by bringing into its fold religion, philosophy and metaphysics.

Raja Rao portrays the life of Ramaswamy and his non-dualistic philosophy. Rama was born in a well-to-do orthodox Brahmin family of South India. A Brahmin is one who devoted to truth and knows Brahman. The novel takes Rama's first marriage and its disintegration as its subject. The marriage of Rama and Madeleine proved to be a failure because Rama was firm believer in Advaita philosophy and Madeleine drifted into Buddhism which believes in dualism and regards the world is an illusion. The Serpent stands for appearance or illusion or Maya. The Rope stands for the ultimate reality or truth or Brahma or the absolute.

The analogy of the serpent and the rope is taken from Advaita philosophy of Sankaracharya, the great philosopher of the 8th century A.D. Sankara says 'Just as owing to one's ignorance of the rope, the rope appears to be serpent, the self is regarded as the individual soul, owing to the absence of the true knowledge of the self. At the word of a reliable person the illusion disappears and what seemed to be a serpent is now seen as a rope.'

Rama in the beginning wishes to pursue the non-dualistic philosophy of Sankara. His references to his 'Upanishadic ancestors' like the sage Yagnavalkya and other sages who attained Truth, and his attraction for the Vedantic classics like the Brahma Sutra and the Upanishads show his interest in the Vedantic philosophy which form an integral part of Indian metaphysical tradition. Ramaswamy's Brahminic philosophy is revealed in the opening sentence of *The Serpent and Rope*. Ramaswamy is concerned with the meaning of true Brahmin and its influence on him.

I was born Brahmin-that is, devoted to Truth and all that. 'Brahmin is he who knows Brahmin', etc. etc... but how many of my ancestors since the excellent Yagnyavalkya, my legendary and Upanishadic ancestor, have really known the truth excepting the sage Madhava, who founded an Empire or rather, helped to build an Empire, and wrote some of the most-profound of vedantic texts since Sri Sankara?

(SR, P. 1)

Every incident or conversation that takes place in the life of the narrator is presented in the context of furthering or hindering his progress on his quest for truth and knowledge. The way the narrative is presented is as timeless as India itself, with the familiar blend of fact and fable. The novel tells the story of Rama and particularly his marriage while reflecting on the flavor and tradition of India. The novel also ruminates on themes of East meets West as Rama leaves his native India and moves to Europe.

Rama is described as a kind young man who is somewhat frail because of his tubercular lungs. He has been living and studying in France and has married a French woman, Madeleine. Rama plans to finish his thesis on the Albigensian heresy and then to move back to India, bringing Madeleine with him. Early on in the novel, from the moment Rama first references his wife, the reader gets a sense that something is not right in their marriage.

Madeleine and Rama have a son together, their first child, but he dies when he is only seven months old. After this tragedy, Rama must return to India because his father is dying as well. Rama stays in India to preside over his father's cremation in Benares and accompanies his step-mother whom he refers to as "Little Mother" on a pilgrimage of the city's holy places, after which he must return home to his wife in France. For Rama, this trip intensifies his longing to better understand himself, making him acutely aware of the nagging feeling of incompleteness inside of him.

From Benaras they go over to Allahabad where they stay for some time with an old friend of Rama's father. There he meets Pratap Singh who is betrothed to Savithri, the young western Educated daughter of Raja of Surajpur. She is backing home from Cambridge at the time for the vacations and Rama is introduced to her, so that he may get an opportunity of changing her views. Rama is fascinated by her. When Rama first meets Savithri, his first impression of her is not great; he believes she is too much of a "modern" woman. Although he does not think too highly of her at first, he finds that he cannot get her out of his mind. This further serves to confuse Rama and complicate the situation between him and Madeleine. Rama said "**beneath Savithri's militant modernism lies a spirit kindered to his own - a spirit Indian to the core**". (SR. P. 208)

Rama returns to France and to his wife, though he feels more distant from her than ever. At their first dinner together after his return, Madeleine, sensing the change in her husband, asks him if she has failed his gods somehow. He responds by saying that she has not failed his

gods, but she has failed him. Rama thinks of the toe rings in his bag that were given to him by Little Mother to bestow upon Madeleine, but he cannot bring himself to give her the gift, feeling that things are just too far gone.

Rama and Madeleine struggle to maintain an air of normalcy, even temporarily reigniting the intimacy in their marriage, but it is short-lived. Savithri, always in Rama's thoughts, comes back into his life when she visits him and Madeleine in France. Rama then accompanies her to England in order to continue the research for his thesis. The more time they spend together, the more time becomes aware of his deep love for her. He recognizes that his feeling for Savithri far surpass his love for his own wife.

Rama has a hard time coming to terms with his feelings for Savithri, especially considering that he is married to someone else. At the same time, he feels that his love for Savithri is bringing him closer to understanding his own truth and following a path of integrity. In a climactic symbolic gesture, Rama gives the toe rings from Little Mother to Savithri. Considered an important marriage ritual in India, this bears great significance for the relationship between Rama and Savithri.

Rama goes back to France where Madeleine is pregnant. He once again leaves her for India and his sister's wedding. Rama needs to make an emergency visit to Bangalore for health reasons, and while he is there, he learns that Madeleine gave birth prematurely to a second son who has died. Soon afterward, he learns that Savithri has gotten married. He returns to France to be with Madeleine who has become deeply ingrained in her own Buddhist practice, with drawing further from Rama.

Rama goes to London for lung surgery where he receives a visit from Savithri. They accept that they must part ways and that fate has led them in separate directions. After staying in

Paris for some time he went to Axis to meet Madeline. Madeleine treated him an interlude. She asked him why he had come. He told her that he had come to see her. She said that her body was an illusion made of the aggregates. She said that in that case it was no concern of here she started counting her rosary. Rama was shocked at her attitude and came out of her house and returned to Paris.

They acknowledge that love is about rejoicing in one another's happiness. Rama divorces Madeleine after the distance between them grows too big to ignore. Rama's thesis is now complete and he showed it to his supervisor. Rama felt that there was no point in his returning to India. He realizes that the answer he has been seeking lies in the journey to seek out his Guru and that all of the trials and tribulations of his life have led him to this realization.

Rama finds his Guru in Trivandrum and advaita emphasizes the role of the Guru in removing ignorance of the nature of reality. Raja Rao's personal life has some similarities with the novel because he himself was a disciple of Atmananda guru. Rama believes that only the Guru can help and answer to the questions so he decided to come back to Trivandrum or Travancore India, in search of a spiritual guru who will be able to help him to find absolute truth.

No, not a God but a Guru is what I need, "Oh Lord, My Guru, My lord I cried , in the middle of this dreadful winter night. Lord, My Guru come to me, tell me; give me thy touch, vouchsafe, I cried, „the vision of Truth, Lord, My Lord"

(SR, P. 307)

Therefore, he goes to Travancore to meet his Guru. **GiS. Amur**, says "Rama's journey doesn't end with Savithri. The end, which is in a very real sense a new beginning, is reached when Rama discovers his Guru. Appropriately enough the terms in which the discovery is presented suggest that it was for Rama an experience outside time and space."

Raja Rao has used myths and symbols to convey the profound view of life and has made a part of the central framework of his novels. Raja Rao finds myths for communicating his metaphysical concerns as he is gifted with encyclopedic knowledge of Indian mythology, history and culture of Europe, he successfully draws material from these sources. Thus, myths and symbols emerge as a significant mode of technique to convey his view of human reality.

Raja Rao means to say that he writes not only about the European background setting of the story, but also about his personal life from a historical standpoint. As the novel is written from the first person point of view, it expresses the narrator's feeling and thoughts and his vision of the world outside him. Rama takes interest in **non-dualistic philosophy**. For him all phenomena are unrealities and the only real reality is the Brahman which dwells in our selves. Yet, Rama doesn't deny significance to these appearances. Though the appearances are illusory, they do bear a relationship to ultimate Truth or Reality. This seems to be Raja Rao's view of the world, and he makes his task to demonstrate this relationship

I am not telling a story here I am writing the sad and uneven chronicle of a life, my life, with no art or decoration, but with the 'objectivity', the discipline of the 'historical sciences', for by taste and tradition I am only a historian.

(SR. P. 408)

Ramaswamy who lives in a belief that **the whole world is illusion and maya**. His vital relationship with Madeleine and Savitri are controlled by his Brahminic identity and his conscious quest of knowledge through Brahminic philosophy. India is a cause of the parting of Rama and Madeleine Each tried to adopt other's world view and too divergent to permit fruitful of life. Rama believes that,

You see the serpent and in fear you feel you are it, the serpent. One- the Guru- brings the lantern; the road is seen, the long white road, going with the stars. It is only the rope. He shows it to you. And you touch your eyes and know that there never was a serpent"

(SR. P. 204)

Rama explain to Madeleine the position of Hinduism as against Buddhism and other religions. He also explains why he has called the story of his life 'The Serpent and the Rope'. He says that there can be only two attitudes to life. **Either you believe that the world exist and so-you. Or you believe that you exist-and so the world.** The first is the belief of the Vedantist and the second is the belief of the Marxists. In between there are many poetic systems. Buddhism is the supreme religions of a poet. Buddhism believes in compassion and we can have compassion only for some suffering thing. Buddhism believe that the world is real. Buddhism is a personal religion and it believes in dualism.

In course of time Buddhism took more and more of Vedanta in to it. The Buddha became a Hindu avatara and Mahayana became almost a vedantic system. What was Indian remained in India and what was not Indian was exported to other lands. He further explains that world is either or unreal or real. If look at the rope from the serpent we see paradises, saints, avataras gods, heroes and universes. But there is on serpent at all. It is a mere illusion. If we want to see the reality we have to seek the guidance of a Guru. He brings the lantern which will enable us to see the road leads to the absolute reality behind the illusion.

The world is either unreal or real - the serpent and the rope ... You look at the rope from the posture of the serpent, you feel you are the serpent - you are - the rope is. But in true fact, with whatever eyes you see there is no serpent, there never was a serpent. You gave your own eyes to the falling evening and cried, "Ayyo! Oh ! It's the serpent! "One the Guru - brings you the lantern, the road is seen, the long, white road, going with the statutory stars. "It's only the rope".

He shows it to you. And you touch your eyes and know there never was a serpent.

(SR. P. 333)

On his second home-coming a changed Ramaswamy encounters a changed Madeleine. Madeleine's study of Buddhism has now similarly imparted to her a kind of escape from her frustration. She gradually withdraws herself from the world in general and from Ramaswamy in particular. Madeleine and Rama marriage ends in divorce. Rama feels himself drawn towards Hinduism and Madeleine, towards Buddhism, it is so because, their cultural and spiritual preoccupations are totally different.

Both Rama and Madeleine are in search of their separate identities. And thus search for identity is modern man's thematic preoccupation or even obsession. In the twentieth century man's life has become more complex than it was before. So the modern man is in search of his own identity. The focal point of the novel is to identify the self and one should not mistake the rope for the serpent. Narasimhaiah rightly comments on the central theme of this novel. He says that,

Man must learn not to mistake the relative for the Absolute, the moment for eternity, the particular with the universal, ... the rope for the serpent. Only that knowledge is knowledge which makes for this discrimination ... the end of all earthly endeavour is that knowledge is the self.

(SR. P. 220)

Madeleine is attracted towards Buddhism. And this is the central theme of the novel. The major difference between Buddhism and Advaita Vedanta is that according to Sankara there are no selves but only Self, and the world which is apparently perceived is an illusion. But Buddhists hold that the world is real. Therefore, the marriage fails not because Europeans and Indians can never understand each other but because the two parties stand for different metaphysical system.

The ritual marriage of Ramaswamy and Savithri is explained in term of the external love of Radha and Krishna. Savithri is predestined to be the partner of Rama's spiritual life. Rama says, "**I understand the rhythm and meaning of history through her**". Even though Rama and Savithri could not unite in real life they were spiritually one and made for each other. They were married because Rama had broken coconut to kumkum on her forehead and put the toe-ring with his own hand on her toe. He had also told Savithri to go to her Brinthan, the town associated with Lord Krishna and Radha for their adolescent love.

Rama stands for the individual Self and Savithri, for the power of devotion. In addition to this, the holy places like Benares, the Himalaya, the river Ganga are symbolically used. The rope in the title and the sea in the epigraph stand for the Absolute Truth, on the other hand, the serpent represents illusion and the waves in the epigraph stand for the individual soul which is the real Self. Of all, the Savithri-Satyavan symbol is significantly used in this novel. Rama and Savithri are the symbols of creative power of the universe. All men and women are one and Savithri merges into Radha and Krishna and the two then into Shiva and Parvati and ultimately in all such figures. At last there is no dualism but 'Om.' Rama says that **There never was time, there never was history, there never was anything but Shivoham - Shivoham. I am Shiva, I am Absolute. (SR. P.216)**

This mythicized worship of husband and wife has its parallel in an actual ritual which is still widely practiced in India. **M.K. Naik** is perfectly right when he says that "this interpretation of the Savithri legend is in line with the symbolism with which Sri Aurobindo has invested the age-old story in his great epic Savithri. Here, Satyavan is truth, married to Savithri who represents love and the power of devotion. Thus The Serpent and the Rope is replete with rich symbols, legends, and myths. That is why Dr. M.K. Naik calls it "**a kind of modern Indian Mahapurana** (Major Purana) in miniature. It shows the Puranic blend of different subjects, motifs, and techniques, though naturally on a much reduced scale".

Rama holds definite views on philosophy matters and he is never tired of expanding them. When explaining his views he goes into irrelevant details and long digressions. The story halts and he describe in detail the story of Radh and Krishna. Rama's relationship with Savithri was a step towards his spiritual enlightenment. Physically they were far apart. He was Krishna and she was Radha. Even when he is lying in a serious condition in London hospital and Savithri comes to see him, he does not give rest to his lungs and vocal chords. He used the hospital bed as a forum for expounding his views love, pain, dharma and death. He holds definite view on all matters and he is not prepared to concede that there may be some truth in the contrary view. He is a historian he does not have the objectivity of a historian. But Rama is firm in his convictions and finds evidence to prove his conclusion. Rama rejects all evidence which goes against his assumption. He is not prepared for a give and take in philosophical matter.

Savithri was there not in me, but as in me; not someone for, unreal relegated to a country in rounded space, but as light which seemed never to fade, never to know where to -go like that constant sound the texts say which in the silence of things the first vibration, the primary sound, OM propounds itself and from which all that world is created.

(SR. P. 267)

Rama is very happy with savithri who regards him as a preceptor or teacher. In fact, she regards him as a God. He is her Krishna and what he says is gospel truth for her. Madeleine loves him very much but she is an intellectual and she is not always prepared to accept his view. On many points they holds opposite views. Rama believed that Advaita (non-dualism) was an essential part of Hinduism. This was the ideology of Shankara and his disciples and Rama thought that this alone was right.

The contrary view that God and man are separate entities according to him. He collected evidence from Vedas, Purans, the Gita and myths and legends to prove his point. He became interest in the Albigensian heresy due to philosophical not historical reasons. The

Hindus and Catholics believed in non-dualism while the Buddhists and Cathars were inspired by the Buddhist beliefs and they were persecuted by the Catholics because the latter believed in non-dualism.

Madeleine did not agree with his views. Under the influence of Iezou she adopted the extreme Tibetan variety of Buddhism which believed in asceticism, celibacy and mortification of the flesh. Rama could not accept this and so their marriage wrecked. If she had remained a Catholic there would be no rift because Catholicism was closer to Hinduism than Buddhism. Rama said that, **I am studying the Algiensians to prove that I am metaphysically right** (SR, P.15)

Ramaswamy's life is one long search for self-knowledge or self-realization. He wanders from place to place in this quest. He therefore, call himself a pilgrim or holy vagabond. The first step that such a pilgrim has to take is to crush his ego or his personal self. It is only then that he becomes fit to love the lord. He has said that

The path of love is very narrow; It cannot be crossed by two-per sons. So long as I was there the lord was not there. I could move along the path only when I merged with the lord.

(SR, P. 209)

There are two ways to attaining this end. The first is the path of renunciation or denial of life. The devotee gives up all worldly attachment and concentrates on spiritualism. The second is the path of active involvement in life. The devotee gives up his ego or his selfish or personal self and performs all his duties in this world in a selfless manner.

The first path was chosen by Madeleine. She gave up all desires and mortified the flesh. This did not crush her ego: it only strengthened her. Rama chose the second path. He crushed his ego completely and performed his duties in the world in a selfless manner. He reduced himself to zero and acted as dutiful son, brother, husband and friend.

Rama is left entirely unattached at the end of the novel. Now the quest theme which runs through the whole narrative can be seen from the ending of the novel. Rama writes in his diary:

This happened, this happened so long ago-Oh as long ago as I have known myself be. Ever since being has known itself as being I have known it. It is the gift that Yagnyavalkya made to maiteryi, it is the gift Govinda made to Sri Sankara. It is the gift He made to me, my lord. May I be worthy of the Lord, Lord, my master! O thou abode of Truth.

(SR. P.449)

Rama now needs nothing but his Guru to guide him in attaining the Supreme Reality. In this way finally Rama decides to go to his Guru who alone can destroy his ego and make him fit for an eternal marriage with Savithri which could bind her to him with imperishable love of Radha for Krishna. True marriage is thus a mating of two souls which is only a preparation for the ultimate union of the soul with God. Rama's relationship with Savithri leads him towards further self-realisation. **M.K. Naik** observes, **It is his encounter with Savithri that makes Rama fully and truly conscious of his spiritual heritage and his love for her becomes a stepping-stone to his ultimate realization of Truth.**

The discovery of actual truth regarding the riddle of being releases the self from the trap of birth and death. Lack of understanding makes life futile. Hence a perception of reality regarding self is required as this embodies the Supreme Truth. Only when a quester realizes the transitory nature of the "serpent" and "illusory" nature of Reality, can he perceive the mutability of world experience. Dissociating himself from the world, he tends to minimize his bodily activities.

within, with oneself. All the problems are really spiritual problems. Yet it is true that the phenomenal world, the serpent, cannot be easily conjured up.

The truth, the ultimate or the only truth may be the rope only, but the Guru is yet to come with the lantern. In one of his sudden transitions, Rama describes the novel as "the sad and uneven chronicle of a life, My life. (SR. P. 290)

After his marriage Rama has to choose between two entities- the Serpent which stands for unreality and is the symbol of the seductive world, and the rope which stands for reality that is hidden because man looks at it through the serpent's eyes. Finally Rama separates from his French wife and comes to Travancore to find out the Guru. The Serpent and the Rope an attempt is made to redefine man's relation to the supernatural of the absolute in terms consistent with modern thought.

At the beginning of the novel we find Madeleine to be more alive, more physically and mentally healthy, than the grim and fanatical ascetic at the end of the novel. Ironically, Madeleine has been more successful in relying only on the **Absolute** than Ramaswamy, who returns to an immersion, not in the Absolute, but in the rich and crowded culture of Hindu India where he will no doubt feel something figuratively similar to a mother's warm embrace and love.

In contrast Raja Rao seems to illustrate that Madeleine has achieved her state at the expense of starving something human in herself. Focus. It is not Madeleine who feels there is nobody to go to now: no home, no temple, no city. He reports looking, of all places, into the Encyclopedia for a Western description of God where he finds "sixty-two pages, and they do not illuminate my need." This leaves him thinking that he needs, "not a God but a Guru" just as Madeleine tragically did in marrying him. It is Ramaswamy who confesses,

I am ashamed to say I weep lot these days. I go to bed reading something, and some thought comes, I know nor what-thoughts have no names-or - have they?- and I lie on my bed and sobs. Sometimes singing some chant of Sankara, I burst into sobs. Grandfather kittana used to say that sometimes the longing for god becomes so great, so acute, you weep and that sometimes the longing for god for god? God is an object and I cannot long for him. I cannot long for round, red thing, that one calls god, and he becomes God.

(SR. P. 448)

Ramaswamy burdens every relationship with his longing for God. As a Vedantist he believes that each person is a mask of God deluded because they do not sufficiently recognize this in the entanglements of everyday life. He hopes to dispense with masks, both with others but especially with himself in seeking to be loved, in seeking to dissolve the ego in a mother's all-consuming love. This is different from Christianity that proclaims that the individual is a creature of God who, at best, maintains a relationship with the divine. Whereas Hinduism proclaims that man is ignorant of his true identity in Brahman, Christianity says that man is estranged from God by having his own ego and will that God forgives us for having, if we are saved. Raja Rao seems to illustrate, mutually exclusive views. Ramaswamy is dedicated to the sadhana of insight; Madeleine is dedicated to the path or technique of will power.

Rama attains here another dimension in his quest for selfhood. But he realizes he has a long way to go — "Krishna is not Krishna yet." The horse Kanthaka is waiting for him but he is not taking refuge in renunciation, he is going into battle. The horse symbolizes quest, and as the road is long, Rama's realization makes him humble. Waves are nothing but water. So is the Sea, says the epigraph at the beginning of the novel and its implications are realized by Rama only in the end, when he accepts the discipleship of his Guru. Kanthaka must take him now to Travancore. But that is not the end of the journey, for harnessing one's ego is no easy job. True marriage implies a complete negation of the ego, which is possible only at death. But Rama is

now ready to move to the next stage in the journey of his soul. He, himself, has been a Guru to Savithri, but there is no limit to the development of the "self." Rama has recognized this truth and has cultivated the humility to accept discipleship. His commitment to his "India" is abiding and clear:

India is not a country like France is, or like England ; India is an idea, a metaphysic. Why go there anyhow, I thought; I was born an exile, and I could continue to be one. My India I carried wheresoever I went. But not to see the Ganges, not to dip into her again and again . . . I would go back to India, for that India was my breath, my only sweetness, gentle and wise; she was my mother. I felt I could still love something: a river, a mountain, the name of a woman . . .

(SR. P. 376)

Travancore this time. Benares has been conquered and the South must yield its spiritual riches in defining an Indian identity. Travancore is the new capital in the symbolic and psychic geography of Rama's self. The quest does not end with the end of the book, the dissolution of Rama's marriage with Madeleine does not signify any shrinking of Rama's spirit. It only signifies that Madeleine's France is not his France, nor Madeleine's India is his India. So this divorce is also a discovery. The obvious tragedy is actually an enrichment and affirmation in the sense that identity crisis has been successfully resolved.

This India is Truth and beyond any formulation of conflicting polarities of good and evil: "India is everybody's: India is in everybody. Rama is a quester after this "India," this eternal Truth. For him this is true joy, true freedom. But for Madeleine India can at best be a paradise. This gap between these two attitudes is never bridged. Rama wants to prove that he is metaphysically right and he defines his identity at this stage in relation to the Absolute. All

women are perfect for they have "the feminine principle in them and all men are perfect when they turn inward, and know that the ultimate is man's destiny"

India has no history, for Truth cannot have history. If every battle of France has been fought for humanity, then it would be honest to say no battle in India was ever fought for humanity's sake. Or if fought, it was soon forgotten. Krishna fought against Bhisma by giving Bhisma courage. Mahatma Gandhi fought against the Muslims by fighting for them. He died a Hindu martyr for an Indian cause. He died for Truth.

(SR. P. 109)

The Serpent and the Rope are the symbols of illusion and reality in Indian tradition and it is Raja Rao's fond hope to weave into his novel his ideas regarding illusion and reality. The psychological action is also very important. The novel is concerned, Rama is the reality, the rest is illusion. Raja Rao says that he is the reality and Rama, Madeleine, Savithri and all other characters are the serpent, the glamour of the novelist's illusion.

The novel presents a sociological or an East- West problem. But all the problems are the serpent. They are not the real problems. The real problem is not establishing the harmony without, or with another but within, with oneself. All the problems are really spiritual problems. Yet it is true that the phenomenal world, the serpent, cannot be easily conjured up. Ramaswamy also believes that there are no significant differences among people or cultures. He informs his wife that her notions of the divine are illusory cultural projections. He wishes to use Madeleine to seek a deeper awareness of Brahman or to better worship the feminine power of Brahman as Shakti. Rama advises Madeleine that **the gods were neither Hindu nor Greek; being creations of your own mind they behaved as you made them .** (SR, P. 55)

Ram's entire life was conditioned by his abiding faith in Advaita philosophy which he regarded as synonymous with Hinduism. **True reality is spiritual.** This is the truth, the sea. The waves and sea are one. The Atman and Parmatman are one. This is essence of Advaita philosophy of non-dualism or oneness of all. Epigraph are very appropriate to the Rama's life.

The Serpent and the Rope is pessimistic about cross cultural understanding. The novel suggests that the deepest values – those we cannot give up without giving up our very identity – are created by social imaginaries or formative cultural intuition formed through childhood praxis. Raja Rao seems to illustrate that although all roads may lead to the Absolute, the roads are different. The very form of the novel, as a first person struggle for self-understanding as well as trying to fathom the thinking of someone from a different culture, illustrates cultural solipsism. Ramaswamy comes to the West to pursue a doctorate in Christian history, marries a French woman, but cannot escape his dharma or social imaginaries; how his Hindu culture makes sense of his experience.

Ramaswamy cannot be saved by Madeleine, Savithri, or a God manifest in history with a mother and father. Such an image and concept is simply not a manifestation of what Ramaswamy understands as divine. Ramaswamy is a mystic who longs to be absorbed in the Absolute, not have a relationship with it that condemns him to alienation or separation as a distinct ego. In the end, Ramaswamy repudiates his scholarship and the attempt to understand the West to return to Mother India.

Raja Rao has successfully interwoven Vedantic vision and wisdom of age old Indian scriptures by adopting the mythic and archetypal pattern of narration. The very theme of novel is the knowledge of the 'self,' so a straightforward and descriptive narrative technique would have been inappropriate to explore the philosophical thoughts and meditation which transcends the

limitations of time and space to carry universal appeal which may be yardstick to the whole modern generation. In order to serve this purpose, Raja Rao has employed the mythic and archetypal images with their symbolic undertones to highlight the theme of this novel so as to place it to the epical grandeur. **Iyenger** states in this regard that **The Serpent and the Rope** – a far more complex work – is a novel as a modern Indian Mahapurana (major epic legend) in miniature.

The main movements in the novel are the protagonist's quest for self-realization, an attempt on his part to solve the earthly dilemma, his elevation into the realm of reality culminating in the final promise of monistic vision. The fulfillment of the promise comes at the end of a long journey, a journey which makes the protagonist come into contact with various countries and cultures and meet with experiences which involve interactions with various types of individuals drawn from diverse geographical and cultural orientation. Raja Rao is endeavouring to sift his own tradition with a view to selecting the best in our ancient thought and culture. He is trying to articulate this selective best to achieve identity in modern terms Ganges symbolizes humanity, so does the mysterious womanhood — the feminine principle.

Truth began where sorrow was accepted, and India began where Truth was acknowledged. So sorrow is our river, sorrow our earth, but the green of our trees and the white of our mountains are the affirmation that Truth is possible; that when the cycle of birth and death is over, we can proclaim ourselves the Truth. Truth is the Himalaya, and Ganges Humanity.

(SR. P. 39)

Rama believes that Advaita (Non-dualism) is an essential part of Hinduism. This is the ideology of Shankara and his disciples. The contrary view that God and man are separate entities was, according to Rama, repugnant to Hinduism and to India. He has collected evidences from the Vedas, Puranas, the Gita and myths and legends to prove his point. He


becomes interested in the Albigensian heresy due to philosophical reasons. The Hindus and the Catholics believe in non-dualism while the Buddhists and the Cathars believe in dualism

Ramaswamy sees that there is much in common between the principles of the Cathars and those of Buddhism. He wants to prove in his thesis that the beliefs of the Cathars owe their origin to Indian Buddhism. Being a scholar of European history, he is well-versed in the France philosophical systems of the East and the West. He is ready to study, analyse and discuss order to arrive at the truth. Thus, Raja Rao brings out to the people of all types in India, England and in the Rope that the Advaita Vedanta and French Culture go so intimately into the working of the book.

The 'Rope' in the title and 'Sea' in the epigraph as given by Atmananda Guru, stand for the 'Ultimate Reality'. Rama sees the world, at first, as an illusion (Serpent), while his wife, Madeleine, later regards the **world as real** (Rope). Raja Rao skillfully brings together Rama of the East and the Madeleine of the West into wedlock and this solemnity of the occasion points to the novelist's endeavour for cultural rapprochement not only through religion but also through philosophical concepts.

Rao discovered that the inner essence of man seeks Truth and strives for merger with the Ultimate Reality. The incessant search for the Absolute thus became the theme - song of Raja Rao's novels. Modelled on Indian epics, they are rooted in the Advaita Darshan of Sankaracharya. Thought, philosophy, belief, felt-experience and diverse religious influences form the basic data of Rao's creative psyche where no boundaries exist. The traditional framework may be restrictive but Rao's genius penetrates through the apparent to grasp the inner core of reality. Truth being Truth remains the same despite its manifestations. Intensive readings, felt experiences were all Rao's voyages of discovery into the nature of Truth, differences between appearance and reality, existence and death related issues. Rama said, **I cannot repent,**

as I do not know what repentance is. For I must first believe there is death. And this is the central fact – I do not believe that death . (SR, P. .9)



The Serpent and the Rope is a complex and multifarious work of art and hence can be studied at various levels. On narrative ground, it is named as an account of Ramaswamy's quest for self realization and transcendence which enables a man to distinguish between 'illusion' and 'reality.' This self realization can be acquired through Vedantic Philosophy according to which dualism is 'illusion' and the conviction in 'non-dualism' is true enlightenment

The Serpent and the Rope established Rao as a great writer of philosophically complex novel and a true artist. This novel is regarded and as the greatest metaphysical novel ever written in English Language. The theme is overwhelmingly serious-and Indian quest for truth in his encounter with one patio-temporal reality, growing into and acute crisis of identity because the hero and orthodox Brahmin who claims to belong to a timeless ethos, is found however, immersed in the modern western culture dominated by historicity. The theme of true marriage leading to self-knowledge is the core of this novel. Man's life is barren and futile, if he does not make effort for the quest of the Absolute. This novel is complex, massive, subtle and mature work. The Serpent and the Rope is a Mahapurana, having a wonderful sweep like the Puranas, the novel has the element of history and is saturated with stories, fables and legends. He deals with a vast panaroma of human experience.

CHAPTER III

CONCULSION

Raja Rao deals with the theme of self-knowledge, self-transcendence or self-fulfilment. *The Serpent and the Rope* is metaphysical insofar as it explores the nature of spiritual and metaphysical quest in some of its complex meaning. Rama is in the midst of avidya or ignorance and he searches for the light of spiritual truth. He ultimately finds that this light can be shown to him only by the Guru. The Guru brings inner illumination which shows that individual soul and the supreme soul are one and the same and the objects of the world are only an external appearance of Internal Reality which is true reality.

The Serpent and the Rope is an autobiographical novel. The protagonist, Ramaswamy is created in the image of the author. Ramaswamy's life is identical with that of the author. Both of them marry a French woman and go abroad for their higher studies. The most significant aspect of their personality is that they have a philosophical bent of mind. The names of the protagonist and the other characters have a connotative reference to the old myths. Though the protagonist bears the name of Rama, he is Krishna for Savithri who acts as his Radha in the novel.

The serpent and the rope is not a complete novel in its metaphysical quest. At the end of the novel the hero finds a way to self-realization that is Guru. The opening passage itself of *The serpent and the rope* shows how Rao uses the many allusions not to exhibit the erudition of his central character. He uses Sanskrit and Indian philosophy to create an atmosphere for Rama's metaphysical quest. Raja Rao's writing is persuasive that critics have generally tended to take Ramaswamy as truly learned Indian, and a Sanskrit scholar which is more important.

The theme of the novel is obviously illusion and reality. Raja Rao's use of symbols in the novel provides authenticity to the character of Madeleine and Ramaswamy. The Serpent and the Rope is a philosophical novel. Through this novel Raja Rao has found a new genre - the philosophical novel, and has vividly and forcefully realized the confrontation of eastern and western cultures. He presents sociological problem - whether the marriage between a Hindu Brahmin and French woman is possible or not

The protagonist concerned with ultimate reality and the title itself makes the reader expect an exposition of Advaita Vedanta. Ramaswamy does not follow Sankara to the exclusion of other systems of Indian philosophy, though he time and again proclaims his faith in Advaita Vedanta and Sankara. A consideration of the way he approaches the feminine principle makes this clear. For Ramaswamy, the feminine is not only the maya or Advaita, but it is also a shakti or prakriti of Samkhya system of Indian philosophy. When Ramaswamy says that the world is for annihilation, one feels that he is expressing the Mayavada (theory of maya or illusion).

Ramaswamy is a kind young man. He is somewhat frail because of his tubercular lungs. While studying in France, he has married Madeleine, a French woman. Now Ramaswamy is looking to finish his thesis on Albigensian heresy and then move back to India. In the beginning, Ramaswamy gives hints that his relation with his wife is not going so well. Their married life has some concerns about their mutual understanding.

Their first child, a son, has died just after seven months of its birth. Now, his father is on the verge to die. For this, he must return to India. He returns to India though his wife remains there in France. In India, he has a stepmother who has served his father till his death. He calls her as 'Little Mother'. He and his mother attend rituals and ceremonies. They go on a pilgrimage to holy places as part of it. Having performed all ceremonial duties of a son, He goes back to France to be with his wife.

Ramaswamy is longing to understand himself and his life in a better way especially about his incompleteness within himself. During the trip to France, he meets Savithri, a Cambridge student. She is engaged to one of his friends. She confesses to him that she is not in love with the man. Initially, he considers her to be a modern sort of woman and does not think highly of her. Despite this fact, he is not able to keep her away from his thoughts. Reaching home, he feels himself to be more distant more his wife than ever. At their first dinner together after his return, Madeleine, too realizing a change in him, asks him if she has failed his gods somehow. He replies that she has not failed his gods, but she has failed him. His mother had given him the toe rings to be bestowed upon Madeleine as blessings. But now he feels so distant to her that he cannot give her the gift.

Rama realizes that things have gone too far now. He no longer sees her as his beloved wife. One reason contributing to this situation is his desire for Savithri. Eventually his mind becomes so much obsessed with her thoughts that it starts to hurt his married life. His relation with his wife becomes even more tense and complicated as his own situation with introduction of Savithri in his life. Savithri visits him and Madeleine in France. Ramaswamy accompanies her to England in order to complete his research thesis. They spend time together and he realizes his deep love for her.

At the same time, he is not able to express his love, provided the fact he is already married. He gives her those toe rings as a gift and she accepts. This marks a great significance in their relationship. On the other hand, Madeleine is pregnant with their second baby. But he has to leave for India for sister's wedding. Due to his declining health, He has to make an emergency visit to Bangalore. While he is there, he gets to know that Madeleine gave birth prematurely to a second son who has died. Later he also learns that Savithri has got married. Now he goes back to France. She has become a Buddhist and draws herself completely away from her husband.

Ramaswamy goes to London for lung surgery. Savithri visits him. They accept it as their fate and resolve to part in their ways. They acknowledge that the true love is about rejoicing in one another's happiness. Ramaswamy divorces Madeleine. He realizes that the answer he has been seeking lies in the journey to seek out his Guru and that all of the trials and tribulations of his life have led him to this realization.

The story revolves around Ramaswamy, his wife Madeleine and his spiritual lover Savithri. However, Ramaswamy's quest for Absolute Truth and the philosophical discussion regarding the Self and the Brahman become so dominant that the main story is driven into margin. In other words, his philosophy transcends the main story of Ramaswamy. That's why **Dr. M.K. Naik** appropriately calls *The Serpent and the Rope* 'a semi-autobiographical novel'.

The Serpent and the Rope refers to the concept of illusion and reality, influenced by Sankaracharya's philosophy, it emphasises the dichotomy between the two and establishes the fact that reality and illusion are two faces of the same coin. They are co-existent. Though illusion cannot exist in isolation, it is the essence that gives meaning to reality. This is done through the phenomenon of duality. The insubstantial objects of dreams have no existence beyond sleep. Similarly observed extant world around the individual is non-existent in the truest sense.

According to Acharya Sankara, the whole world of duality consisting of subject and object is only an act of the mind. The mind is only an organizer of sensory operations. Even though absorbed in deep sleep, it projects the surroundings in waking and dream states. The cosmos prevails as long as this filter functions and ceases to exist in its absence. Rao also believed in the attainment of an impersonal state which was beyond the physical and mental. It was an experience of the spirit. *The Serpent and the Rope* needs to be examined against this sound background from scriptures and metaphysics from Rao's own *The Meaning of India*.

In *The Serpent and the Rope*, Rao has generously granted Ramaswamy physicality. He has been provided an aura of a rich culture and Vedic tradition. The concretisation has added life as well as color to the portrayal. It has also lent authenticity to his personality. Ramaswamy unintentionally adopts the route of world experience. He wanders in search of a spiritual preceptor who could lead him over the threshold of Immortality. In this sojourn, he comes across many people, mainly women, who appear to his young, dispassionate, discriminating and perceptive psyche as various manifestations of the omnipotent God. He interacts with each of them on various levels.

The novel beautifully expounds 'jnana yoga'. Ramaswamy's quest for fulfilment comes to a conclusion through knowledge ('jnana'). His faith is born out of self effort. Being a scholar, an intellectual and a metaphysician, he realizes that he has to do all by himself, though the clue to get out of the labyrinth of maya will be shown by the mentor whom he seeks. Only the spiritual guide can help him out of the darkness of ignorance, releasing within him, and the light of knowledge. At the end of the novel, the quester perceives a ray of hope that his guru may impart wisdom and thus enlighten his path towards self-realization.

Raja Rao has a very significant role in altering the scene of the modern Indian-English novel. He has contributed a lot in highlighting the spiritual aspect in the life of man. The modern man is lost in the spiritual quest for Truth and Almighty in order to find out the real meaning of life. It is this spiritual quest which Raja Rao has tried to delineate authentically in his novel. Raja Rao has highlighted the philosophical, intellectual, political and social aspects in his novel *The Serpent and the Rope*.

Raja Rao has successfully portrayed the life-styles and cultures of various countries and cities enriching his accounts with well-documented details. Besides, he unifies them all into a meaningful whole treating them as several manifestations of one and the same divine spirit. Rao's great achievement is that he has evolved a new art form by fusing the western type of

novel with an Indian theme and Indian tradition of storytelling. In *The Serpent and the Rope*, the narrator is a highly educated philosopher whose mind is a whirlpool of cultural, philosophical and religious currents and cross-currents.

The novel has been written according to the Western agnosticism by Raja Rao's projection of encyclopedic scope in its lively narration. Of all the novels, this novel is a mature revelation of his philosophical thinking. Besides, a kind of cultural rapprochement has been made in the novel. *The Serpent and the Rope* is the most prominent literary work that came into existence with the maturity of Raja Rao and is generally known as the spiritual and philosophical autobiography of the novelist containing metaphysical undertone running parallel throughout the novel.

Rao's contribution to the growth of the English novel is a trendsetter. *The serpent and the rope* gave a new direction to the Indian novel English by philosophizing it. His range and vision transcend all barriers. He used the fiction medium to portray his patriotic and philosophical concern in a masterly way. The conscious use of myth in Rao is seen in the digressional method of story-telling of which he is the outstanding exponent. This method is perhaps the oldest device in narrative literature.

Raja Rao is incontestably one of the major novelist writing in the English language today. A **Sahitya Akademi** winner for his novel *The Serpent and the Rope*. Raja Rao is undoubtedly one of the most widely acclaimed Indian-English novelist by virtue of his wide range of thought content philosophical intellectual, political and social and his command of the fictional form, language and technique. Raja Rao has a very significant role in altering the scene of the modern Indian-English novel So there is a variety in Raja Rao's novel *The Serpent and the Rope*. Prof. **M.K. Naik** rightly remarks about the significant contribution of Raja Rao to Indian novel in English. A blend of metaphysical tradition and his susceptibility to western culture has made his

novels philosophically complex. The **Serpent and the Rope is Mahapurana**. Raja Rao has used myths and symbols to convey the profound view of life and has made a part of the central framework of his novels.

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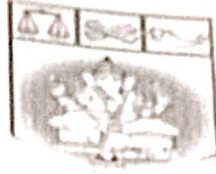
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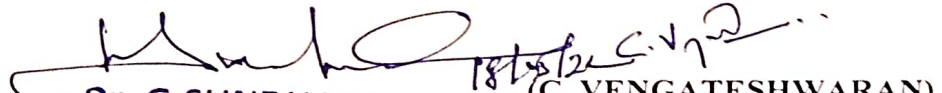
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This is certify that the project work entitled "A STUDY ON SOCIO-ECONOMIC CONDITIONS OF THE TAXI DRIVERS IN PONNAMARAVATHI TOWN PUDUKOTTAI DISTRICT" is submitted by R.YOGAPRIYA (Reg.No.CB19A144451) in partial fulfilment of the requirement for the award of the degree of Bachelor of Social work in Bharathidasan University under my guidance. This project is original one and not submitted earlier for the award of my degree/diploma elsewhere.

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**A STUDY ON STRESS AMONG THE WOMENS IN PONNAMARAVATHY
PUDUKOTTAI DISTRICT**

Submitted to the Bharathidasan University in partial fulfilment of
the requirements for the award of degree of

BACHELOR OF SOCIAL WORK

Submitted

by

M.Mubarak

(Reg.No.CB19A144444)

Under the guidance & supervision of

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March -2021

**GANESAR COLLEGE OF ARTS AND SCIENCE
DEPARTMENT OF SOCIAL WORK
MELAISIVAPURI**

DECLARATION

I, hereby declare that the project “**A STUDY ON STRESS AMONG THE WOMENS IN PONNAMARAVATHY PUDUKOTTAI DISTRICT**” submitted to Bharathidasan university, is a record of original project done by me under the supervision of **M.SHARMILA DEVI,M.S.W., M.PHIL.,** Head and Asst professor, Department of social work, Ganesar College of Arts and Science . This work did not form part of any research or degree awarded by any other University or College elsewhere in India or Abroad.

Place:

Signature of the candidate

Date:

(M.Mubarak)



**GANESAR COLLEGE OF ARTS AND SCIENCE
DEPARTMENT OF SOCIAL WORK
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This is to certify that the project work entitled “**A STUDY ON STREES AMONG THE WOMES IN PONNAMARAVATHY PUDUKOTTAI DISTRICT**” is submitted by **M.MUBARAK (Reg.No.CB19A144444)** in partial fulfilment of the requirement for the award of the degree of Bachelor of social work in Bharathidasan University under my guidance. This project is original one and not submitted earlier for the award of any degree/diploma elsewhere.

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Thanking you.

M.MUBARAK

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**A STUDY ON STRESS AMONG THE WORKING WOMEN IN
PONNAMARAVATHY,PUDUKOTTAI DISTRICT**

CHAPTER – I

INTRODUCTION:

Almost all people at some times in their life experience stress that relates to their occupation often there stress full situation are minor and brief, and have little impact on the person, But for many people the stress is intense and continues for long period of time. In any form organisation of paid employment there are a large number of potential source of stress. The characteristics of job itself, the role of the person in the organisation, interpersonal relationship at work, development pressure, the climate and structure of the organisation and outside world etc., are some of the factors.

Since the late 1960s through the 1970 and the 1980 several catchment studies and surveys have been carried out in India, correlating demographic variables, such as marital status age, education, etc, with the occurrence of mental illness. Henderson, Byrne and Duncan-jones (1981) write: ‘The general principle in epidemiology is to determine the distribution’. Epidemiological studies provide statistical correlation between social variables and the frequency of mental illness.

Stress research has come a long way since its earlier origin as an engineering term to the subsequently used in human factors research originally stress was seen primarily as a physical trauma to which humans respond more recently it has been linked to physical events, as well as the appraisal of the events which is a cognitive phenomenon (Apply and Trumbull, 1986:;jones Bright, 2001: kroemer et al: 2001).

Stress is a word derived from the Latin word stringere, meaning to draw tight. A stress is any force that pushes a psychological or physical factor beyond its range of stability, producing a strain within the individual (cooper, 1996) As stress begins to take its toll on the body and mind a variety of symptoms can result, Although the word stress usually has negative connotations stress is about too many demands and a lack of control.

“Women have always worked even when Adam delved and eve span, women have always worked was not a ‘drone’ in this household, but an active ‘bee’ and had distinct function to perform” (memorial 1981: 627). In primitive days women associated with in the

narrow sphere of their kitchen-cooking, child bearing, rearing and catering to the husband and other members of the family. They had no idea of the outside family activities except what learn from menfolk.

History is replete with examples often inferior roles assigned to females in relation to males. The biological differences women bear children and are on an average, physically weaker than men-reinforcement by the cultural norms and the value system. This placed women secondary to men.

A woman is the mother of the race and the future of all generations. She is the nucleus around which the universe revolves. It is the women who has sustained the growth of society and moulded the future of nations. She is looked upon as the nourishes, provider, counsellor, developer and an equal sharer of all the joys and sorrows of life. So Manu says “Gods dwell where women are adored”. It is she who “creates the world, she who preserves and destroys”. With a more wink of her wondrous eyes, she holds the universe in her womb. So it is truly said, “The hand that rocks the cradle, rule the world”.

Table-1 Progress of literacy rates during 1901-2001

Census Year	Percentage of literate		
	Population to total Population	males to total male population	Female to total female population
1901	5.35	9.83	0.69
1911	5.92	10.56	1.05
1921	7.16	12.21	1.81
1931	9.50	15.59	2.93
1951	16.67	24.95	7.93
1961	24.02	24.95	12.95
1971	29.35	34.44	18.44
1981	36.23	39.51	24.82
1991	42.89	46.89	32.41
2001	49.74	56.24	37.32

Note: undivided India excluding Jammu & Kashmir

1. Census of India 1971 series in India, part-T1A.r
2. Union primary census Abstract registrar general and census commissioner India. New Delhi, 1974. P X X IV.
3. Census of India 1981
4. Census of India 1991 series- 1paper 2 of 1991.

Table – 2

Distribution of working female population in India 1911 – 2001

Year	Percentage of female workers to total female population.
1911	33.7
1921	33.7
1931	27.6
1941	N.A
1951	23.3
1961	28.0
1971	14.2
1981	19.7
1991	22.7
2001	29.6

Note: the 1951 census figures don't include the state of Jammu & Kashmir.

Source: census of India 1961, paper No 1 of 1962, final population & census of India 1991, series India, provisional population total: workers and their distribution. Paper 3 of 1991

Problems and difficulties of working women:

A married working women or mother has to face various types of problems and difficulties. She has multiple responsibilities and it is often a tightrope walk for her to juggle so many time consuming activities. A married woman has a dual responsibility: looking after her home on side and her job on the other this causes a lot of strain for her. Though she may be adding considerable to her family's income her job is looked upon as 'secondary'.

CHAPTER – II

REVIEW OF LITERATURE

A review of available literature as related to the subject is an important and integral part of any study. A critical survey of the literature on the subject will help in knowing the aims and objectives, methodology and finding of research studies and project in the past. Views of the literature thus help in identifying the research gaps of a subject and need for the present study.

C.D.Epstein (1971:549 – 563) has indicated that dual – career individuals experienced guilt, because they were not conforming to the socially approved work family structure. Furthermore the women often had to deal with implied or overt social control placed on them by their children.

Ramu (1972) also found in his study that majority of the husband in single and dual earner families have superior position because of the patriarchy in Indian society they do not want to help their wives in household chores.

A.C.Bebbington (1973:530-537) has noted that role cycling unlike other source of strain, has a developmental pattern. Both employment and family careers have become points at which there is a restructuring of role which become source of normative stress.

Rapport & Rapport (1976:302-305) describe the problem of work and role overload as a common source of strain for dual career families. Rapport suggests that overload was affected by 4 conditions, which were in part self-imposed:

1. A degree to which having children and a family life (as distinct from simply being married) was salient.
2. A degree to which the couples aspired to a high standard of domestic living.
3. The degree to which was satisfactory reapportionment of
4. The degree to which the social psychological overload compounded the physical overloads.

Research suggested that lack of stimulation could be as harmful as excessive stimulation, in other words boredom was as harmful as having too much to do (French, Kaplan and van Harrison, 1982) Hellesey et al (1985) identified limited career opportunity as a problem creating frustration and reduced motivation among workers.

Time pressure was examined as a potential stressor since it is an important precursor to stress (srivina and motowidlo, 1987). The demand of the external environment are greater than the time available to meet them and an individual facing severe time constraints might experience significant level of stress.

In the world wide comparative study of work stress, researchers gathered information from 1,065 managers in ten countries on five continents Brazil, the United Kingdom, Egypt, Germany, Japan, Nigeria, Singapore, South Africa, Sweden and all the united states. Fifty - five percent of all respondent mentioned time pressures and dead line as a stressor, followed closely by work over load.

In study of workers performing heavy labour, wyndham (1969) found that under moderate temperature, workers who performing better than others did so because of other situation variables such as the degree of supervision work performance is directly related to temperature.

Alternately other researchers (Kobasa, 1982: Antosnovsky, 1979) agree that organizational commitment projects the individual from negative because those individual who are commitment to the organization have connected more closely to the individuals at work or because they have found meaning in their work.

Long et al (1992) found that women managers with stronger agnatic traits used more supporters and less demanding and reported fewer daily hassles. A 1992 North western Nation Life Insurance survey reported that one in three workers said that they have thought about auditing because of stress: one in two workers said that job stress reduce their productivity: and one in five workers said they took sick leave in the past month because of stress.

In the 1950s, Han, Selly began a serious study of stressors and stress. He investigated the behavioural and physical changes in individual experiencing various amount of stress eventually conceptualized their responses to stress in term of a general adaptation.

Syndrome (1956, 1976) other studies also have found that the number and severity of stressful events in a tension life are good predictors of potential illness arch workers.

Smith (1989) asserted that environment factors also can cause stress. Things such as very high altitude and very cold climate can be stressful.

Stress affects in numerous ways attendance, excessive use of performance, or even overall poor health (Monday, Noe&Preneaux, 2002).

CHAPTER – III

RESEARCH METHODOLOGY

INTRODUCTION:

This chapter deals with the methodology adopted for the study. It covers statement of the problem, significant of the study, aims & objectives of the study, research design, pilot study, universe, sampling, and scope, pre-test.

MAIN OBJECTIVES:

- To develop the physical and mental health status.
- To improve the residential service, health, mental health and other amenities in the Ponnamaravathy town.
- To know the history of working women in Ponnamaravathy .
- To analysis the stress of working women in Ponnamaravathy .

SCOPE OF THE STUDY:

- ❖ To reduce the stress and the bad effects of stress.
- ❖ To identify the reason for stress to the employees.
- ❖ To prevent the working women from the stress.
- ❖ To increase the self-confident.
- ❖ To give a suggestion.

STATEMENT OF THE PROBLEM:

The working women faced many problem in the society both psychologically and socially, mainly psychological problems affected by these persons are stress, depression, tension, health, problem and mental problems in their family and their self.

SIGNIFICANTS OF THE STUDY:

The working women face more problems in their self like tension, depression, stress, with in self. The researcher discussed with doctors, counsellors, and psychiatrist and faculty advisors two or three respondents and their family members at the time of pilot study. So, the researcher find our stressed women faced so many problems their working place. Thus researcher selected this study as the research.

TITLE OF THE STUDY:

“A study on job stress among working women in ponnamaravathy pudukkottai district”

AREA OF THE STUDY:

The researcher conducted the study at hospital, companies, and shops in Ponnamaravathy at pudukkottai district.

AIMS & OBJECTIVES OF THE STUDY:

To study on stress among working women in Ponnamaravathy at pudukkottai district.

RESEARCH DESIGN:

The researcher attempted to describe the various aspects that cause stress faced by working women. The formulation of research design is an indispensable part of research. Hence the research adopted descriptive research design which aims at describing the variables in the present study the research describes the stress, depression, tension, health problem and mental conditions of the respondents in the relationship between relevant variables.

UNIVERSE:

The study was conducted at schools and surrounding place in pudukkottai district. Universe of the study is particular area. So the universe is infinite.

SAMPLING & SAMPLE SIZE:

Since the size of working women is infinite. The researcher used probability sampling method. The research selected 50 respondents by using through convenient sampling method.

PILOT STUDY:

In order to know the feasibility of conducting the study, the researcher approached the hospital doctors, women in Ponnamaravathy . The researcher obtainable permission to conduct the study and had discussion with working women.

DISCRIPTION ABOUT THE TOOL:

The interview schedule was first part of the study which includes:

- A. Personal data
- B. Psychological condition
- C. Social condition
- D. Economic condition
- E. Family condition

PRE – TEST:

The researcher conducted pre – test with 3 respondents at schools in Ponnamaravathy . Since standardized to have been used there was no necessity to modify the interview schedule.

CHAPTERIZATION:

The researcher consists of the five chapters.

- a) Chapter I : Introduction
- b) Chapter I : Review of literature
- c) Chapter I : Research methodology
- d) Chapter I : Analysis & Interpretation
- e) Chapter I : Suggestion & conclusion

CHAPTER – IV

ANALYSIS AND INTERPRETATION OF DATA

Table – 1

Distribution of respondents according to age

\S.no	Age	Frequency X	%
1.	20 – 25	8	16%
2.	25 – 30	20	40%
3.	30 – 35	12	24%
4.	35 – 40	6	12%
5.	40 and above	4	8%
Total		50	100%

Table 1 describes the age of respondents. A number of the respondents to the tune of 40% were 25 - 30 years old, 24% of the respondents were in the age bracket of 30 - 35 years old, 16% of the respondents were in the age group of 20 - 25 years old, , 12% of the respondents were in the age bracket of 35 - 40 years old, 8% of the respondents were in the age group of above 40 years old, from the data presented it can be seen that stress are more in the age of 25 – 30 years age group.

Table – 2

Distribution of respondents according to educational qualification

S.no	Education qualification	Frequency X	%
1.	Degree	12	24%
2.	PG	22	44%
3.	Other	16	32%
	Total	50	100%

Table 2 describes the educational qualification of the respondents. 44% of the respondents were degree holders, 32% of the respondents were having other qualifications and 24% of the respondents were having PG qualification. From the data presented it can be seen that working women are more among the PG degree holders.

Table - 3

Distribution of respondents according to religion

S.no	Religion	Frequency X	%
1.	Hindu	34	72%
2.	Christian	16	32%
3.	Muslim	0	0%
4.	Other	0	0%
	Total	50	100%

Table - 3 describes the religion of the respondents 72% were Hindus, 32% of the respondents were Christians, and 0% of the respondents were Muslims and others. From the data presented it can be seen that working women were more among the Hindu.

Table – 4

Distribution of the respondents according to marital status

S.no	Marital status	Frequency X	%
1.	Married	36	72%
2.	Single	12	24%
3.	Separate	0	0%
4.	Divorce	0	0%
5.	Widow	2	4%
	Total	50	100%

Table – 4 describes the marital status at the respondents. A good majority of there respondents to the tune at 72% had married, 24% of the respondents were single, 0% of the respondents were separated and divorced persons, and remaining 4% of the respondents were widows, From the data presented it can be seen that working women were more among the married category.

Table – 5

Number of children

Sl.no	Number of children	Frequency X	%
1.	One	16	32%
2.	Two	12	24%
3.	Three	6	12%
4.	Three and above	0	0%
5.	None	16	32%
	Total	50	100%

Table – 5 describes the no of children of the respondents. 32% of the respondents had one and none, 24% of the respondents had two children, 12% of the respondents had three children, and 0% of the respondents three and above children, From the data presented it can be inferred that 32% of the respondents had one children.

Table – 6

Distribution of respondents according to type of family

S.no	Types of the family	Frequency X	%
1.	Joint	28	56%
2.	Nuclear	22	44%
3.	Extended	0	0%
	Total	50	100%

Table 6 describes the type of family of the respondents. A good majority of the respondents to the tune of 56% lived in joint families and remaining 44% of the respondents lived in the nuclear families, from the data presented it can be found/inferred that working women were more among the joint families.

Table – 7

Distribution of respondents according to domicile

S.no	Domicile	Frequency X	%
1.	Rural	10	20%
2.	Urban	40	80%
	Total	50	100%

Table – 7 describes the domicile of the respondents. A good majority of the respondents to the tune of 80% were living in urban areas and remaining 20% of the respondents were living in rural areas. From the data presented it can be seen that working women largely lived in urban areas.

Table – 8

Distribution of respondents according to monthly income

S.no	Income	Frequency X	%
1.	6500 – 7000	26	52%
2.	7000 – 7500	6	12%
3.	7500 – 8000	0	0%
4.	8000 and above	18	32%
	Total	50	100%

Table – 8 describes the monthly income of the respondents.52% of the respondents earned up to 6500 – 7000 rupees, 32% of the respondents earned up to 7000 – 7500 rupees as monthly income, 12% of the respondents earned income ranging from 8000 and above, From the data presented it can be seen that working women were earning 6500 – 7000 rupees income.

Table – 9

Distribution of respondents according to department

S.no	Department of working	Frequency X	%
1.	Nursing	10	20%
2.	Teaching	22	44%
4	Others	8	16%
	Total	50	100%

Table – 9 describes the department of working. 44% of the respondents were working in the teaching field, 20% of the respondents were working in the nursing and also the companies, and 16% of the respondents were working in other department, , From the data presented it can be seen that working women were largely engaged in the the department of teaching.

Table – 10

Distribution of respondents according to travel

S.no	Travel is depending on your own vehicle	Frequency X	%
1.	Yes	20	40%
	No	30	60%
	Total	50	100%

Table – 10 describes the travel depending on own vehicle of the respondents. A good majority of the respondents to the tune at 60% did not own vehicle, and 40% of the respondents come to the work at own vehicle, from the data presented it can be seen that working women were not having sufficient own vehicles.

Table – 11

Distribution of respondents according to travel distance

S.no	Travelling distance	Frequency X	%
1.	3 – 5 km	12	24%
2.	5 – 10 km	12	24%
3.	10 – 15 km	16	32%

4.	15 km and above	10	20%
	Total	50	100%

Table – 11 describes the travelling distance of the respondents. A number of the respondents to the tune at 32% coming from 10 – 15km, 24% of the respondents were coming from 5 -10km, and also 24% of the respondents were coming from 3 – 5km, and 20% of the respondents were coming from 15km and above.

Table 12

Experience of the working women

S.no	Experience	Frequency X	%
1.	1 – 5 years	36	72%
2.	5 – 10 years	12	24%
3	10 – 15 years	0	0%
4.	15 – 20 years	2	4%
5.	20 years and above	0	0%
	Total	50	100%

Table 12 describes the experience of respondents. A good majority of the respondents to the tune of 72% were having the 1 - 5 years of experience, 24% of the respondents were having the experience bracket of 5 – 10 years, 4% of the respondents were in the experience

of 15 - 20 years, from the data presented it can be seen that working women 72% of them had 1 – 5 years.

Table 13

Feelings of women in working time

S.no	Feeling of women in working time	Frequency X	%
1.	Satisfactory	40	80%
2.	Not satisfactory	0	0%
3.	Normal	10	20%
4.	Fully satisfactory	0	0%
	Total	50	100%

Table 13 describe the feelings of women in working time of the respondents. 80% of the respondents were satisfied, 20% of the respondents were feeling normal, it is inferred that 80% of women had satisfied feelings about their work.

Table 14

Working hours in the organization

S.no	Working hours in the organization	Frequency X	%
1.	5hrs	0	0%
2.	8hrs	40	80%
3.	10hrs	10	20%
4.	More	0	0%

	Total	50	100%
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Table 14 describes the working hours in the organization of respondents. A good majority of the respondents to the tune of 80% were working for 8hrs, 20% of the respondents were working for 10hrs.g, from the data presented it can be seen that 80% were working for 8hrs.

Table – 15

Shift comfortable in the work system

S.no	Shift of comfortable in the working system	Frequency X	%
1.	Night duty	0	0%
2.	Morning duty	38	76%
3.	Normal time	12	24%
	Total	50	100%

Table 15 describes the working time of the respondents. A good majority of the respondents to the tune of 76% were willing to work in the morning duty, 24% of the

respondents were wanting the normal time, from the data presented it can be seen that working women up to 76% were willing to work in morning shift.

Table 16

Level of satisfaction in working the shift system

S.no	Level of satisfaction in working the shift system	Frequency X	%
1.	Yes	6	12%
2.	No	44	88%
	Total	50	100%

Table 16 describes the satisfaction level of the respondents. A good majority of the respondents to the tune at 88% of respondents said they were not satisfied with the work shift, and 12% of the respondents were satisfied with the work system, from the data presented it can be seen that more working women disliked their work schedule.

Table – 17

Awards received by the respondents

S.no	Awards	Frequency X	%
1.	Service	14	28%
2.	Honesty	2	4%
3.	None	34	68%
	Total	50	100%

Table 17 describes the award status of the respondents. A good majority of the respondents to the tune of 68% received none, 28% of the respondents have been given service awards, and 4% of the respondents have been given awards for honesty.

Table 18

Medical treatment by the Respondents

S.no	Taking any treatment	Frequency X	%
1.	Yes	14	28%
2.	No	36	52%
	Total	50	100%

Table 18 describes the medical treatment of the respondents. A good majority of the respondents have been 52% not taking any treatment, and 12% of the respondents have been taking treatment, from the data presented it can be seen that working women were largely not taking any treatment.

Table 19

Taking treatment for related problem

S.no	Taking treatment for related problem	Frequency X	%
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1.	Physically	4	8%
2.	Mentally	2	4%
3.	Other	8	16%
4.	None	36	72%
	Total	50	100%

Table 19 describes the related problem of respondents. 72% of the respondents were not taking treatment to any problem, 16% of the respondents had been taking treatment for other problem, 8% of the respondents had been taking treatment for physical problems, and 4% of the respondents had been taking treatment for mental problems, from the data presented it can be inferred that working women 72% were not having any of the problem.

Table 20

Level of satisfaction in working women

S.no	Level of satisfaction in working	Frequency X	%
1.	High	16	32%
2.	Low	4	8%
3.	Medium	30	60%
4.	Worst	0	0%
	Total	50	100%

Table 20 describe the level of satisfaction of working women. 60% of the respondents were having medium level of satisfaction, 32% of the respondents were having high level satisfaction, 8% of the respondents were having low satisfaction, from the data presented it can be inferred that 60% of working women had medium level of satisfaction.

Table 21

Self confidence

S.no	Decrease your self confidence	Frequency X	%
1.	Yes	6	12%
2.	No	44	88%
	Total	50	100%

Table 21 describes the self-confidence of the respondents. A good majority of the respondents 88% were saying their confidence was not reduced by their work, and 12% of the respondents their confidence was reduced by the work they performed, from the data presented it can be seen that working women 88% said the work did not for decrease confidence.

Table 22

Related place for facing the problem

S.no	Related place for facing the problem	Frequency X	%
1.	Angry	10	20%
2.	Tension	22	44%
3.	Blood pressure	2	4%
4.	Stress	8	16%
5.	Other	8	16%
	Total	50	100%

Table 22 describes the related problem of respondents.44% of the respondents were in the problem of tension, 20% of the respondents have the problem of angry, 16% of the respondents have the problem of stress, and also16% of the respondents have other problems, 4% of the respondents have blood pressure, from the data presented it can be inferred that working women 44% had the problem of tension.

Table 23

Practises to decrease the stress

S.no	Practises to decrease the stress	Frequency X	%
1.	Yoga	12	24%
2.	Meditation	10	20%
3.	Any other	12	24%
4.	None	16	32%
	Total	50	100%

Table 23 describes the practise for decreasing the stress of the respondents. A 32% were not having any practices to reduce the stress, 24% of the respondents used yoga, and 24% of the respondents used any other, and 20% of the respondents used meditation, from the data presented it can be seen that working women 32% of the respondents had no practices to decrease the stress.

Table 24

Health problems

S.No	Health problem	Frequency X	%
1.	Blood pressure	2	4%
2.	Sugar	0	0%
3.	Mental problem	0	0%
4.	Other	4	8%
5.	None	44	88%
	Total	50	100%

Table 24 describes the related health problem of respondents.88% of the respondents were in the problem of no health problems, 8% of the respondents had other health problems, 4% of the respondents had been the problem of blood pressure.

Table 25

Related reasons to increase your stress

S.No	Related reasons to increase your stress	Frequency X	%
1.	Working place	16	32%
2.	Over time	12	24%
3.	Salary	18	32%
4.	Relation ship	4	8%

	Total	50	100%
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Table 25 describes the reason to increase the stress of the respondents. 32% of the respondents were depends on salary, 32% of the respondents were dependent on working place, 24% of the respondents were dependent on over time, and 8% of the respondents were dependent on relationship, from the data presented it can be seen that working women 32% dependent on salary and working place.

CHAPTER V

FINDINGS, SUGGESTION AND CONCLUSION

Main Finding:

- 1) A vast majority to the tune of 80% of the respondents were satisfied about the working time.
- 2) A good majority of the respondents to the measure of 80% have been working in the organization.
- 3) A good majority of the respondents to the level of 60% were having medium satisfaction with their work.
- 4) A good majority to the quantum of 88% did not agree with the problem of decreasing their self – confidence.
- 5) Forty four percentage of the respondents have tension that the type of problem facing their time of work. 4% of the respondents have blood pressure.
- 6) Thirty two percentages of the respondents had none of the practice stress reduction programme. Twenty percentages of the respondents had meditation as a type of stress reduction program.
- 7) Thirty two per cent of the respondents have been problem of salary as the reason for increase in their stress. 8% of the respondents have problem of relationship which was a reason for increase in their stress.
- 8) A good majority of the respondents to the tune of 52% were affected by other problem that the problem of facing personal life. 24% of the respondents were affected by stress problem in their personal life.

- 9) A good majority of the respondents to the tune of 52% said sometimes they faced stress situations in their organization. 8% of the respondents said mostly they faced stressful situations in their organization.

- 10) Forty eight per cent of the respondents feel dealing with customers/colleagues made them to undergo stress related to demand. 16% of the respondents feel long working hours caused stress related to demand.

- 11) A majority of the respondents to the measure of 52% had over competition that the stress is related to support. 8% of the respondents had Incentive policy caused stress.

- 12) A majority to the measure of 52% of the respondents handled stressful situation with help of others. While 12% of the respondents optimistically handled the stressful situation.

Suggestions and conclusion:

1. Tension and blood pressure of working women could be reduced by suitable stress reduction methods.
2. Stress reduction program especially meditation, listening to music, exercise, and walking and aerobic exercise could be inculcated in the minds of the working women.
3. Low salary of working women is a reason for stress among the working women, so the salaries of working women need to be hiked. The problem of relationship with others is also cause for stress among the working women and hence relationships with others need to be eased.
4. The personal problems are causing a lot of stress and strain for the working women, and the personal problems need to be reduced for the respondents.
5. Stressful situations in the organizations have to be reduced since most of the respondents faced stress at work place.
6. The working women faced stress by dealing with the customers and colleagues as they over demanded from the working women. So they need to be released by the organization in terms of stress.
7. The over competition and incentive policy in the organization of the working women caused stress to them so the over competition and incentive policy need to be reorganized.
8. The working women faced stress and they managed it with the help of others and only a handful of them optimistically managed stress by themselves. So the working women need to be motivated to manage their stress by themselves.
9. There are good and bad stress. The working women need to identify good stress and accept and manage the same.

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A study on job stress among working women in Ponnamaravathy Town

QUESTIONNAIRE

Demographic details:

1. Name :
2. Sex : a. Male b. Female
3. Age : a. 20 – 25 b. 25 – 30 c. 30 – 35 d. 35 – 40
e. 40 and above
4. Education qualification : a. Degree b. PG c. Others
5. Religion : a. Hindu b. Christian c. Muslim d. Others
6. Marital status : a. Married b. Single c. Separated
d. Divorced e. Widow f. Widower
7. Number of children : a. One b. Two c. Three d. Three and above
8. Family type : a. Nuclear b. joint c. Extended
9. Domicile : a. Rural b. Urban
10. Income : a. 6500-7000 b. 7000-7500 c. 7500-8000
d. 8000 and above
11. Department in which you are working :
12. Traveling by own vehicle : a. Yes b. No
13. Distance between :
residence and working place

14. Spouse employed : a. Yes b. No

15. Years of experience : 1) 1 to 5yrs 2) 5 to 10yrs 3) 10 to 15yrs
4) 15 to 20yrs 5) 20yrs and above

16. How do you feel about the working time?

1. Satisfactory 2. Not satisfactory 3. Normal 4. Fully satisfactory

17. How many hours are you working?

1. 5hrs 2. 8 hrs 3. 10 hrs 4. More

18. Which time do you feel comfortable to work?

1. Night duty 2. Morning duty 3. Normal shift

19. Do you feel uncomfortable with the shift system?

1. Yes 2. No

20. Have you received any award for your performance?

1. Appreciation for Service 2. Appreciation for honesty 3. None

21. Do you take any medical treatment?

1. Yes 2. No

22. If you say yes then what type of problem?

s.no	Reason	Tick
1.	Physical	
2.	Mental	
3.	Other	

23. How is your satisfaction level with your work?

1. High 2.Low 3.Medium 4.Worst

24. Do you face any problem is decreasing your self-confidence?

1. Yes 2. No

25. What type of problems do you face at the time of working?

1. Angry 2.Tension 3. Blood pressure 4.Stress 5. Others

26. Which type of stress reduction program you have done?

1. Yoga 2. Meditation 3. Any other 4. None

27. Please mention your health program from below:

1. Bp 2. Sugar 3. Mental problem 4.Other 5. None

28. What is the reason for increase in your stress?

1. Working place 2. Overtime 3. Salary 4.Relationship

29. What is your feeling at the time of working?

1. Very good 2. Good 3. Normal 4. Worst

30. Please provide the information in table given below:

s.no	Experience	Year of joining	Salary	Condition

31. Do you face any problem, please mention from the table:

s.no	Problem	Tick
1.	Financial	
2.	Family	
3.	Working place	
4.	Other	

32. Is the work culture supportive your organization?

1. Mostly 2. Rarely 3. Sometimes 4. Not at all

33. How often you face stress situations in your organization?

1. Mostly 2. Rarely 3. Sometimes 4. Not at all

34. Most of your stress is related to:

1. Work environment 2. Supervision 3. Work group
4. Social injustice

35. How do you feel while working in the organization?

1. Great 2. Satisfied 3. Unable to concentrate 4. Frustrated
5. Depressed

36. Have you taken leave in the past 12months due to work related stress?

1. Yes 2. No

37. Please indicate if the total workload has changed during last 3years?

1. Workload has decreased 2. Remained the same 3. Workload has increased

38. Stress is related to demand?

1. Dealing with customers/colleagues 2. Administration
3. Need to achieve targets 4. Long working hours

39. Stress is related to support?

1. Feeling work not valued 2. Lack of management support
3. Over competition 4. Incentive policy

40. Whom does you report if you have any problem in your work?

1. Superior 2. Colleagues 3. Functional head 4. Head of the department

41. How do you handle stress situation?

1. Optimistically
2. With the help of other
3. Depends upon the level of hierarchy in the organization

42. To what level the management is effective in handling your stress situation?

1. Completely
2. To certain extend
3. to a satisfactory level
4. Not at all

43. Is the upper management pressure a main reason for your stress?

1. Yes
2. No