

Bachelor of Science

(Mathematics, Statistics & Computers Science)

Syllabus



**School of Distance Education
Andhra University, Visakhapatnam, Andhra Pradesh**

ANDHRA UNIVERSITY
B.Sc. (MSCs)

First Year Courses

Paper 1: English Language
Paper 2: Telugu/Hindi/Sanskrit
Paper 3: Foundation course
Paper 4: Computer Course : Introduction to Computers
Paper 5: Mathematics : Differential equations & Solid Geometry
Paper 6: Statistics: Descriptive Statistics and Probability Distributions
Paper 7: Computer Science : PC Software and “C” Programming

Second Year Courses

Paper 1: English Language
Paper 2: Telugu/Hindi/Sanskrit
Paper 3: Environmental Studies
Paper 4: Mathematics : Abstract Algebra & Real Analysis
Paper 5: Statistics: Statistical Methods & Inference
Paper 6: Computer Science: Object Oriented Programming with Java and Data Structures
Paper 7: Computer Course : Office Automation Tools

Third Year Courses

Paper 1: Foundation Course II
Paper 2: Mathematics :Linear Algebra & Vector Calculus
Paper 3: Mathematics: Numerical Analysis
Paper 4 : Statistics: Applied Statistics
Paper 5: Statistics : Quality, Reliability and Operations Research
Paper 6 : Computer Science :(Database Management Systems)
Paper 7: Computer Science : Operating Systems

SYLLABUS
BA/B.Com/B.Sc Common Paper

ENGLISH TRACKS
A COURSE IN POETRY, PROSE AND GRAMMAR

POETRY :

John Keats : Ode to Autumn
Matthew Arnold : Dover Beach
W.H.Auden : The Unknown Citizen
Wilfred Owen : Insensibility
R. Parthasarathy : From Homecoming
Aduri Satyavathi Devi - Myraid - Winged Bird
Telephone Conversation

PROSE :

Bernard Shaw : Spoken English and Broken English
Will and Ariel Durant : Is Progress Real
Stephen Leacock : The Conjuror's Revenge
A.J. Cronin : The best investment I ever made
Dr. B.R. Ambedkar : Prospects of Democracy in India
Martin Luther King Jr. : I have a Dream
Students of Barbiana : Letter to a teacher
J.B.D'Souza : Taking the law into their hands

GRAMMAR :

Idioms
Tenses
Detection of Errors

BUILDING COMPETENCY
A Course in Reading and Writing English

SHORT STORIES

Leo Tolstoy : Little Girls are Wiser Than Men
Ruskin Bond : How Far Is the River
William Shakespeare : The Merchant of Venice
Rabindranath Tagore : Sacrifice

A Course in Listening and Speaking I

SCHOOL OF DISTANCE EDUCATION

ANDHRA UNIVERSITY

(B.A/B.Com/B.Sc. Degree First Year)

పేపర్ - 1 ద్వితీయ భాష - జనరల్ తెలుగు

అభ్యసన ఫలితాలు (Course Objectives)

ఈ పాఠాన్ని ఒక క్రమబద్ధమైన పద్ధతిలో రూపొందించి అందిస్తున్నాం.

1. పాఠాల్లో పరిచయం, ఉద్దేశం, పాఠ్యం అర్థతాత్పర్యాలు, విషయ విభాగం పాఠ్యభాగ సారాంశం, సందర్భ సహిత వ్యాఖ్యలు మాదిరి ప్రశ్నలు అభ్యాసాలు గుర్తించుకోవలసిన ముఖ్యాంశాలు
2. పరీక్ష దృష్ట్యా ప్రశ్నలు సమాధానాలు, ఆధారగ్రంథాలు చదవదగిన పుస్తకాలు అనే విభజన పాటించడమైంది.
3. పరిచయంలో ప్రక్రియ గురించి, రచయిత గురించి, పాఠ్యం గురించి పరిచయం ఉంటుంది.
4. ఉద్దేశంలో పాఠ్యం స్థూలపరిచయం ఉంటుంది. పాఠ్యంలో చదవలసిన అంశం ఉంటుంది
5. విషయ విభాగంలో పాఠ్యభాగ సారాంశంలోని ముఖ్యాంశాల విభజన ఉంటుంది. తద్వారా పాఠ్యభాగ సారాంశం ఉంటుంది.
6. పద్యాలకు అర్థతాత్పర్యాలు, కొన్ని వాక్యాలకు సందర్భ సహిత వ్యాఖ్యలు ఉంటాయి
7. పాఠం చివర అదనపు సమాచారం చదవదగిన పుస్తకాలు సమకూర్చారు
8. సాహిత్య పఠనాభిలాషను, అధ్యయన కౌశలాన్ని, విమర్శనా దృష్టిని రచనా శక్తిని పెంపొందిస్తాయనీ ప్రత్యేకించి పరీక్షల్లో మీకు కృతార్థతను చేకూర్చి పెడతాయని మేం ఆశిస్తున్నాము.

SCHOOL OF DISTANCE EDUCATION

ANDHRA UNIVERSITY

(B.A/B.Com/B.Sc. Degree First Year)

పేపర్ - 1 ద్వితీయ భాష - జనరల్ తెలుగు పాఠ్యప్రణాళిక

ప్రాచీన కవిత్వం (Syllabus)

1. గంగాశంతనుల కథ - నన్నయ
2. మూషిక మార్జాల వృత్తాంతం - తిక్కన
3. హంసీచక్రవాక సంవాదం - అల్లసాని పెద్దన
4. ఎఱుకత - తరిగొండ వెంగమాంబ

ఆధునిక కవిత్వం

5. మా కొద్దీ తెల్లదొరతనము - గరిమెళ్ళ సత్యనారాయణ
6. మహాప్రస్థానం - శ్రీశ్రీ
7. ముసాపరులు - జాషువ
8. మేఘదూతము - పుట్టపర్తి నారాయణాచార్యులు కథానికలు
9. గాలివాన - పాలగుమ్మి పద్మరాజు
10. ఆకలి - కొలకలూరి ఇనాక్
11. నమ్మకున్న నేల - కేతు విశ్వనాథ రెడ్డి
12. జైలు - పొట్లపల్లి రామారావు

వ్యాకరణం:

1. సవర్ణదీర్ఘ, గుణ, యణాదేశ, వృద్ధి, త్రిక, గసడదవాదేశ, రుగాగమ, టుగాగమ, ఆమ్రేడిత, అత్వసంధి మొదలైనవి. సంధులు.

2. తత్పురుష, కర్మధారయు, ద్వంద్వ, ద్విగు, బహువ్రీహి మొదలైనవి. సమాసాలు ఉపవాచకము: నవల:

ప్రజల మనిషి - వట్టి కోట ఆశ్వురుస్వామి

I B.A. B.COM B.SC DEGREE

SANSKRIT Paper - 1

Course Objectives

1. To develop basic skills in reading, writing, and speaking Sanskrit, including mastery of the Devanagari script, pronunciation, and basic sentence construction.
2. To acquire foundational knowledge of Sanskrit grammar, including noun declensions, verb conjugations, and sentence structure.
3. To build a basic Sanskrit vocabulary, including common nouns, verbs, adjectives, and adverbs.
4. To cultivate an appreciation for the literary and cultural richness of Sanskrit, including the study of major literary genres like epic poetry, and lyric poetry.
5. To develop skills in translating simple Sanskrit sentences and passages into English or Telugu.
6. To deepen understanding of Indian culture and philosophy through the study of Sanskrit texts in these fields, including the Ramayana and Mahabharata and Panchatantra tales.
7. To cultivate an awareness of the historical and cultural contexts in which Sanskrit was used, including the study of major periods and movements in Indian history.
8. To prepare for intermediate-level study in Sanskrit, including the mastery of more complex grammatical concepts and the study of more challenging texts.
9. To develop a critical awareness of the limitations and biases of translations of Sanskrit texts, and to develop the ability to evaluate different translations for accuracy and readability.
10. To engage with the wider community of scholars and enthusiasts of Sanskrit Language and culture, including the use of online resources, attendance at public lectures and events, and participation in student-led activities.

Syllabus

POETRY :

Lesson No. 1 Saranagathi

From Valmiki Ramayanam Yuddhakanda 17th
Canto Slokas 11 – 68

Lesson No. 2 Ahimsa Paramodharmah

From Srimadbharatam, Adiparva 8th chapter Sloka 10
– to the end of 11 Chapter

Lesson No. 3 Raghoh Audaryam

From Raghuvamsa 5th Canto 1 – 35 Slokas

PROSE:

Lesson No. 4	Mitrasampraptih From Pancatantra – Ist Story (Abridged)
Lesson No. 5	Modern prose Chikroda katha Andhra Kavya Kathah By Sannidhanam Suryanarayana Sastry
Lesson No. 6	Computer Yanthram By Prof. K.V. Ramakrishnamacharyulu

GRAMMAR

DECLENSIONS:

Nouns ending in Vowels:

Deva, Kavi, Bhanu Dhatr, Pitr, Go, Rama, Mati, Nadee, Tanu, Vadhoo,
Matr, Phala, Vari & Madhu

SANDHI:

Swara Sandhi :	Savarnadeergha, Ayavayava, Guna, Vrddhi, Yanadesa
Vyanjana Sandhi :	Scutva, Stutva, Anunasikadvitva, Anunasika, Latva, Jastva
Visarga Sandhi :	Visarga Utva Sandhi, Visargalopa Sandhi, Visarga Repha Sandhi, Ooshma Sandhi

SAMASA :

(1) Dwandwa	(2) Tatpurusha (Common)
(2a) Karmadharaya	(2b) Dwigu
(2c) Paradi Tatpurusha	(2d) Gatitaturusha
(2e) Upapada Tatpurusha	(3) Bahuvrihi
(4) Avyayibhava	

CONJUGATIONS

Ist Conjugations – Bhoo, Gam, Shtha, Drhs Labh, Mud,

IInd Conjugation – As

IIIrd Conjugation – Yudh,

IV th Conjugation – Ish

VIII Conjugation – Likh, Kri

IXth Conjugation – Kree

Xth Conjugation – Kath, Bhash, Ram, Vand,

SYLLABUS

BA/B.Com/B.Sc Common Paper Hindi

- A. Prose - Gadya Sandesh,
Editor : Dr. V.L. Narasimham Shiva KotiLorven Publications, Hyderabad.
- B. Non-Detailed - Katha LokEditor : Dr. Ghanshyam
Sudha Publications, Hyderabad
- C. **GRAMMAR** Pertaining to the following topics
 - I. Rewriting of sentences as directed based on : Case, Gender, Number, Tense, Voice.
 - II. Correction of sentences
 - III. Usage of words into sentences
 - IV. Karyalaya Hindi; Administrative Terminology (Prashasanik shabdavali), officialdesignations (padnam)
 - a. Changing English terms to Hindi
 - b. Changing Hindi terms to English
 - V. Sandhi Vichchhed
 - VI. Antonyms (Vilom Shabd)
- D. Letter Writing - Personal Letters, Official Letters, Letter of Complaints, Application forappointment.

SYLLABUS
FOUNDATION COURSE
Common to all 1st Year Degree Students (B.A. / B.Com. / B.Sc.,)
CONTEMPORARY INDIA : ECONOMY, POLITY AND SOCIETY

UNIT - I

Basic features of Indian Economy - Trends in National Income - Role of Agriculture Sector - Problems, Remedial Measures; Industry - Large Scale, Small scale - Problems and remedial measures; a brief review of Industrial policies in India. Role of Public Sector in the context of globalization.

UNIT - II

Population, Poverty, Unemployment and Income Inequalities - Causes and Consequences - Remedies - Inflation - Causes and Remedies - Indian Tax Structure Globalisation, Economic Reforms and their impact on Indian Economy.

UNIT - III

Indian National Movement - Various stages - Its legacy. Integration of Native States and Formation of Modern India. Formation of Andhra Pradesh.

UNIT - IV

Basic Characteristics of Indian Constitution - Indian Political System, Emergence of All India Parties - Regional Parties - Coalition Politics.

Centre - State Relations - Emerging trends - Various Commissions - Rajamannar Committee, Anandpur Sahib Resolutions, Sarkaria Commission. Indian Foreign Policy - Non - Aligned Movement
- Local Self Governments in the light of 73rd 74th Constitutional amendments. Right to Information Act
- Governance- factors influencing Governance - Civil Society.

UNIT - V

Salient features of Indian Social Structure, Social Groups : Primary and Secondary, Association - Institution. Status and Role - Norms, Values and Customs. Concept of Socialisation – Agencies of Socialization.
Gender Issues - Women Liberation Movements in India - Domestic Violence, Women empowerment - Entrepreneurship Programs - Child Labour.

Human Rights – Importance and violation of Human Rights.

ANDHRA UNIVERSITY
FOR ALL B.A/B.COM/B.Sc. Common Paper
I YEAR
THEORY PAPER-IV
INTRODUCTION TO COMPUTERS

Course Objectives

1. Demonstrate the basic principles of computer software and hardware, Input devices, output devices.
2. Apply skills and concepts of computer hardware and software.
3. Learning about storage devices and operating system basics
4. Learning how data communicates.
5. Understanding the basics of email and web based communication.
6. Understanding the basics of information security and privacy.
7. Create personal, academic and business documents using MS-word.
8. Create PowerPoint presentations

COURSE OUTCOMES:

1. Gaining practical experience in using office automation tools for professional and personal use.
2. Prepare for further study or careers in office administration, data entry or other related fields.
3. Able to use of office automation tools, including formatting documents, creating spreadsheets, and designing presentations.
4. Developing a foundational understanding of office automation tools and their applications.
5. Developing skills in file management and data backup.

Syllabus

Unit-1: Exploring Computers

Exploring Computers and their uses :

Overview: Computers in our world, The computer defined, Computers for individual users, Computers for organizations, Computers in society, Why are

computers so important.

Looking inside the computer system:

Overview: Detecting the ultimate machine, The parts of a computer system, The information processing cycle, Essential computer hardware: processing devices, memory devices, Input and output devices, Storage devices, System software, Application software, Computer data, Computer users.

Using the keyboard and mouse:

Overview: The keyboard and mouse, The keyboard, How the computer accepts input from the keyboard, The mouse, Variants of the mouse, Ergonomics and input devices.

Inputting data in other ways:

Overview: Options for every need and preference, Devices for hand, optical input devices, Audio-visual input devices.

Video and Sound:

Overview: Reaching our senses with sight and sound, Monitors, Ergonomics and monitors, Data projectors, Sound systems.

Unit-2:Storage Devices and Operating System Basics

Printing: Overview: putting digital content in your hands, Commonly used printers, High-quality printers, Thermal – wax printers, Dye-sublimation printers, Plotters.

Transforming data into information:

Overview: The difference between data and information, How computers represent data, How computers process data, Machine cycles, Memory, Factors effecting processing speed, The computer's internal clock, The Bus, Cache memory.

Types of storage devices:

Overview: An ever-growing need, Categorizing storage devices, Magnetic storage devices—How data is stored on a disk, How data is organized on a magnetic disk,

How the operating system finds data on a disk, Diskettes, hard disks ,Removable high-capacity magnetic disks, Tape drivers, Optical storage devices, Solid-state storage devices, Smart cards, Solid-state disks.

Operating system basics:

Overview: The purpose of operating systems, Types of operating systems, Providing a user interface, Running programs, Managing hardware, Enhancing an OS utility software.

Networking Basics:

Overview: Sharing data anywhere, anytime, The uses of a network, Common types of networks, Hybrid networks, How networks are structured, Network topologies and protocols, Network media, Network hardware.

Unit-3:Data Communications and Computer Programs

Data Communications:

Overview: The local and global reach of networks, Data communications with standard telephone lines and modems, Modems, uses for a modem, Using digital data connections, Broadband connections, Wireless networks.

Productivity Software:

Overview: Software to accomplish the work of life, Acquiring software, Commercial software, Freeware and public domain software, Open-source software, Word processing programs, Spreadsheet programs, Presentation programs, Presenting information managers.

Database management Systems:

Overview: The mother of all computer applications, Databases and Database Management Systems, Working with a database.

Creating Computer programs:

Overview: What is a computer program, Hardware/Software interaction, Code, machine code, programming languages, Compilers and interpreters, Planning a computer program, How programs solve problems. Programming languages and the programming process:

Overview: The keys to successful programming, The evolution of programming languages, Worldwide web development languages, The Systems development lifecycle for programming.

Unit-4:MS-Word

Word Basics: Starting word, Creating a new document, Opening pre existing document, The parts of a word window, Typing text, Selecting text, Deleting text, Undo, Redo, Repeat, Inserting text, Replacing text, Formatting text, Cut, Copy, Paste – Formatting Text and Documents: Auto format, Line spacing, Margins, Borders and Shading.

Headers and Footers : Definition of headers and footers, creating basic headers and footers, creating different headers and footers for odd and even pages.

Tables : Creating a simple table, Creating a table using the table menu, Entering and editing text in a table, selecting in table, adding rows, changing row heights, Deleting rows, Inserting columns, Deleting columns, changing column width.

Graphics: Importing graphics, Clipart, Insert picture, Clip Art Gallery, using word's drawing features, drawing objects, text in drawing.

Templates: Template types, using templates, exploring templates, modifying templates.

Macros: Macro, Recording macros, editing macros, running a macro.

Mail Merge: Mail Merge concept, Main document, data sources, merging data source and main document, Overview of word menu options word basic toolbar.

Unit-5:Ms-Power Point

Power Point: Basics, Terminology, Getting started, Views

Creating Presentations : Using auto content wizard, Using blank presentation option, Using design template option, Adding slides, Deleting a slide, Importing Images from the outside world, Drawing in power point, Transition and build effects, Deleting a slide, Numbering aslide, Saving presentation, Closing presentation, Printing presentation elements.

BA/B.Com./B.Sc. Common Paper
PAPER I : General English
SYLLABUS

POETRY :

1. John Donne: THE SUN RISING
2. Wordsworth: THE SOLITARY REAPER
3. Robert Frost: THE ROAD NOT TAKEN
4. Chinua Achebe: REFUGEE MOTHER AND CHILD
5. Nissim Ezekiel: GOODBYE PARTY FOR MISS PUSHPA
6. Tripuraneni Srinivas: I WILL EMBRACE ONLY THE SUN

PROSE :

7. Satyajit Ray: FILM MAKING
8. Isai Tobolsky: NOT JUST ORANGES
9. Herman Wouk: A TALK ON ADVERTISING
10. AG Gardiner: ON SHAKING HANDS
11. Arnold Joseph Toynbee: INDIA'S CONTRIBUTION TO WORLD UNITY
12. Ngugi wa Thiongó: DECOLOISING MIND

SHORT STORIES FOR READING COMPETENCE :

13. Gita Hariharan: GAJAR HALWA
14. Norah Burke: MY BROTHER, MY BROTHER

ONE-ACT PLAYS FOR READING COMPETENCE :

15. Fritz Karinthy: REFUND (One Act Play)
16. William Shakespeare: JULIUS CAESAR (CAESAR'S MURDER SCENE)

WRITTEN COMMUNICATION:

17. WRITING CURRICULA VITAE
18. E-CORRESPONDENCE

EXERCISES FOR WRITING COMPETENCE:

19. JUMBLED PASSAGES
20. PARAGRAPH-WRITING

A COURSE IN LISTENING AND SPEAKING II:

- Part- I: Listening Skills
- Part- II: Speaking Skills
- Part- III: communication Skills
- Part- IV: Telephone Skills

SCHOOL OF DISTANCE EDUCATION

ANDHRA UNIVERSITY

(B.A/B.Com/B.Sc, Degree Second Year)

పేపర్ - 2 ద్వితీయ భాష - జనరల్ తెలుగు

అభ్యసన ఫలితాలు (Course Objectives)

ఈ పాఠాన్ని ఒక క్రమబద్ధమైన పద్ధతిలో రూపొందించి అందిస్తున్నాం.

1. పాఠాల్లో పరిచయం, ఉద్దేశం, పాఠ్యం అర్థతాత్పర్యాలు విషయ విభాగం, పాఠ్యభాగ సారాంశం, సందర్భసహిత వ్యాఖ్యలు మొదలైన ప్రశ్నలు అభ్యాసాలు గుర్తించుకోవలసిన ముఖ్యాంశాలు
2. పరీక్ష దృష్ట్యా ప్రశ్నలు సమాధానాలు, ఆధారగ్రంథాలు చదవగలగిన పుస్తకాలు అనే విభజన పాటించడమైంది.
3. పరిచయంలో ప్రక్రియ గురించి, రచయిత గురించి, పాఠ్యం గురించి పరిచయం ఉంటుంది
4. ఉద్దేశంలో పాఠ్యం స్థూల పరిచయం ఉంటుంది. పాఠ్యంలో చదవలసిన అంశం ఉంటుంది.
5. విషయ విభాగంలో పాఠ్యభాగ సారాంశంలోని ముఖ్యాంశాల విభజన ఉంటుంది తద్వారా పాఠ్యభాగ సారాంశం ఉంటుంది
6. పద్యాలకు అర్థతాత్పర్యాలు, కొన్ని వాక్యాలకు సందర్భ సహిత వ్యాఖ్యలుంటాయి
7. పాఠం చివర అదనపు సమాచారం చదవగలగిన పుస్తకాలు సమకూర్చారు
8. సాహిత్య పఠనాభిలాషను, అధ్యయన కౌశలాన్ని, విమర్శనా దృష్టిని, రచనా శక్తిని పెంపొందిస్తాయనీ ప్రత్యేకించి పరీక్షల్లో మీకు కృతార్థతను చేకూర్చి పెడతాయని మేం ఆశిస్తున్నాము.

SCHOOL OF DISTANCE EDUCATION

ANDHRA UNIVERSITY

(B.A/B.Com/B.Sc, Degree Second Year

పేపర్ - 2 ద్వితీయ భాష - జనరల్ తెలుగు

ప్రాచీన కవిత్వం (Syllabus)

1. వామనావతారము - పోతన
 2. శాలివాహన విజయము - కొఱవి గోపరాజు
 3. గ్రీష్మర్తువు - రఘునాథ నాయకుడు
- ఆధునిక కవిత్వం

4. హరిజన శతకము - కుసుమ ధర్మన్న
5. ధర్మసంవాదము - పింగళి, కాటూరి
6. బతకమ్మా! బ్రతుకు - కాళోజీ నారాయణరావు
7. మనిషి - డా॥అందెశ్రీ
8. రాయలసీమ - గంజి కేంద్రము - బెళ్లూరి శ్రీనివాసమూర్తి
9. వంటిల్లు - విమల

గద్యభాగం

1. తెలుగుభాష - ఆచార్య గుజ్జర్లమూడి కృపాచారి
2. వ్యక్తిత్వ వికాసం - ఆచార్య రాచపాళెం చంద్రశేఖరరెడ్డి
3. మాధ్యమాలకు రాయడం - ఆచార్య యస్.జి.డి. చంద్రశేఖర్
4. అభివ్యక్తి నైపుణ్యాలు - డా॥ పి.వి. సుబ్బరావు

ఉపవాచకం:

1. పాలేరు - బోయిభీమన్న

వ్యాసాలు, వ్యాకరణం

అలంకారములు - ఉపమ, రూపక, ఉత్పేక్ష, స్వభావోక్తి, అతిశయోక్తి - అర్థాంతరన్యాస, దృష్టాంతము

ఛందస్సు - ఉత్పలమాల, చంపకమాల, శార్దూలం, మత్తేభం, కందం, తేటగిత్రి ఆటవెలది.

School of Distance Education
Andhra University - Visakhapatnam
II B.A. B.COM B.SC DEGREE
SANSKRIT Paper – 2

Course Objectives

1. To continue building a strong foundation in Sanskrit grammar, including the mastery of Alankaaras, Pratyas, and sandhi rules.
2. To develop the ability to read and comprehend simple Sanskrit texts, including prose and poetry, with the help of dictionary and basic vocabulary.
3. To deepen understanding of Sanskrit vocabulary, including the ability to recognize and use common words, idioms, and expressions.
4. To develop skills in translating Sanskrit texts into English or Telugu, with attention to accuracy, clarity, and style.
5. To cultivate an appreciation for the literary and cultural richness of Sanskrit texts, including the study of major genres like moral prose, drama, and lyric poetry.
6. To deepen understanding of Indian philosophy and religion through the study of Sanskrit texts in these fields, including the Mahabharata and Upanishads.
7. To develop skills in analysis and interpretation of Sanskrit texts, including the ability to identify themes, motifs, and rhetorical devices.
8. To cultivate an awareness of the historical and cultural contexts in which Sanskrit texts were produced, including the study of major periods and movements in Indian history.
9. To prepare for advanced study in Sanskrit or related fields, including the pursuit of graduate degrees or careers in academia, publishing, translation, or cultural preservation.
10. To develop independent research skills through the completion of assignments on a topic related to Sanskrit language, literature, or culture.

Syllabus

- | | |
|---------------------------|---------------------------|
| (1) Drama | (2) Drama (Modern) |
| (3) Upanishad | (4) Prose |
| (5) Bhoja Prabandha story | (6) History of Literature |
| (7) Alankaras , | (8) Grammar |

Drama

1) Pratima Gruham

Pratima of Bhasa III act only

2) Modern Drama

Bharata Samskruteh mulam

P. Sreeramachandrudu from (Susamhata Bharatam VI act)

Prose

4) Sukanasopadesah

From Kadambari Sangraha

5) Bhojasya Saraswati Sushama

From Bhojaprabandha Page No. 74 (Abridged form)

6) Poets and Books from History of literature

1) Panani

(2) Kautilya

3) Bharatamuni

(4) Bharavi

5) Magha

(6) Sri Harsha

7) Bhavabhuti

(8) Sankaracharya

9) Dandin

(10) Jagannadha

7) Alankaras from Kuvalayananda

(1) Upama

(2) Ananvayaa

(3) Utpreksha

(4) Deepakam

(5) Aprastutaprasamsa

(6) Drstantam

(7) Arthantaranyasa

(8) Virodha Bhasa

(9) Ullekha

(10) Vyajasthuti

8) Grammar

Declensions :

Halanta Nouns

- | | |
|-------------|--------------|
| (1) Jalamuc | (2) Vac |
| (3) Marut | (4) Bhagavat |
| (5) Pachat | (6) Rajan |
| (7) Gunin | (8) Naman |
| (9) Vidwas | (10) Manas |

Pronouns :

Asmad, Yushmad, Idam, Tat, Etat, Yat, KimParticiples :

Ktva, Lyap, tumun, Kta. Ktavat, Shatr, Shanac, Tavva

BA/B.Com/B.Sc Common Core
SECOND LANGUAGE

HINDI

PAPER-II

A. Poetry Text - Kavya Deep

Editor : Sri B.Radha Krishna Murthy, Maruthi Publications, Guntur.

B. History of Hindi Literature:

Main tendencies of all the four ages with special references to the following authors and poets:

(1) Chand Vardai (2) Kabir das (3) Surdas (4) Tulasidas (5) Mirabai (6) Raheem (7) Biharila (8) Bharatendu Harisdhandra (9) Mahaveer Prasad Dwivedi (10) Maithilisharan Gupt (11) Premchand (12) Jayashankar Prasad (13) Pant (14) Nirala (15) Maha Devi Verma (16) Agryeya (17) Dinkar.

C. General Essay:

(1) Sahitya Aur Samaj (2) Vidyarthi Rajniti (3) Vidyarthi Aur Anushasan (4) Aaj Ki Shiksha Niti (5) Vigyan: Abhishap Ya Vardan (6) Nari Shiksha (7) Samaj Main Nari ka Sthan (8) Adhunik Shiksha Aur Nari (9) Bharat Main Berojgari Ki Samasya (10) Bharat Par Bhoomdalikaran Ka Prabhav (11) H.I.V./Aids (12) Paryavaran Aur Prabooshan (13) Bharat Main Badhati Hui Janasankhya Ki Samasya

D. Translation from English to Hindi

E. Prayojan Moolak Hindi: (1) Prayojanmooka Hindi: Arth Evam Swarop (2) Raj Bhasha, Rastra Bhasha aur Sampark Bhasha.

SYLLABUS
(BA/B.Sc/ B.COM COMMON PAPER)
Paper-III ENVIRONMENTALSTUDIES

Course Objectives:

1. To make the students realize the importance and their role in the protection and maintenance of a healthy Environment for sustainable development
2. To enable students to grasp the significance and issues related to ecosystems, biodiversity and natural resources, ways of managing/ protecting the environment
3. To enable students to have minimal understanding of environmental pollution, solid waste management and climate change and act with concern environmental issues.
4. To make students aware of the environmental policies and movements, and the role of individuals and communities in environmental protection for educating and inspiring the young minds.

At the end of the course, students will—

1. Understand the importance and dimension of a healthy environment, become environmentally conscious, skilled and responsible in all their action with a concern for sustainable development.
2. Comprehend the significance and issues related to ecosystems, natural resources and biodiversity and become aware of the need and ways to protect/preserve them.
3. Grasp the issues related to environmental pollution, solid waste management and climate change and become conscious and proactive in the discharge of their responsibilities towards the environment
4. Become aware and appreciate the value and concern of environmental movement and policies and the role of communities, and act responsibly on environment related issues.

Unit – 1: Environmental studies - Introduction

1. Definition of Environment-Its scope and importance.
2. Measuringand defining Environmentaldevelopment; indicators

Unit – 2: Basic principles of Ecosystem functioning

1. Concept of an ecosystem
2. Structureand function of an ecosystem.

3. Producers, Consumers and decomposers,
4. Energy flow in the ecosystem.
5. Food chains, food webs and ecological pyramids
6. Introduction, types, characteristic features, structure and functions
 - Forest ecosystem
 - Grassland ecosystem
 - Desert ecosystem
 - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit – 3:Environmental and Natural Resources

1. Forest resources
 - Use and over-exploitation
 - Deforestation
 - Timber extraction
 - Mining and dams- their effects on forest tribal people
 - Case studies
2. Water resources
 - Use and over—utilization of surface and ground water
 - Floods, droughts
 - Conflicts over water
 - Dams –benefits and costs
 - Mineral resources
 - Use and exploitations
 - Effects of extracting and using mineral resources
 - Case studies
3. Food resources
 - World food problem
 - Changes caused by agricultural and overgrazing
 - Effects of modern agriculture, fertilizer, pesticide problems, water logging and salinity.
 - Case studies
4. Energy resource
 - Growing energy needs
 - Renewal and non renewable energy sources
 - Use of alternate energy sources
 - Case studies

5. Land resources

- Land resource
- Common property resources
- Land degradation
- Soil erosion and desertification

Unit – 4: Biodiversity and its conservation

1. Introduction – Genetic, species and ecosystem diversity
2. Bio-geographical classification of India
3. Value of biodiversity – consumptive and productive use, social ethical, and option values
4. Biodiversity – global, national and local levels
5. Hot spots of biodiversity – habitat loss, poaching of wildlife, man-wildlife conflicts
6. India as mega diversity nation.
7. Endangered and endemic species of India.
8. Conservation of biodiversity -in-situ and ex-situ conservation

**II YEAR B.A./B.Com., /B.Sc.,
PAPER-2 OFFICE AUTOMATION TOOLS**

OBJECTIVES:

1. Understanding the features and functionality of office automation tools, including word processing software, spreadsheet software and presentation software.
2. Learning how to create and manage databases.
3. Understanding the basics of email and web based communication.
4. Understanding the basics of information security and privacy.

COURSE LEARNING OUTCOMES:

1. Gaining practical experience in using office automation tools for professional and personal use.
2. Prepare for further study or careers in office administration, data entry or other related fields.
3. Able to use of office automation tools, including formatting documents, creating spreadsheets, and designing presentations.
4. Developing a foundational understanding of office automation tools and their applications.
5. Developing skills in file management and data backup.

Unit-1: MS EXCEL BASICS

Excel basics: The usual spread sheet features, overview of excel features, Getting Started, creating a new work sheet, selecting cells, navigating with the undoing and repeating actions, entering and formatting numbers, entering and editing formulas, repeating cells, order of evaluation in formulas, look up tables, copying entries and equations to minimize typing, more auto fill examples, creating custom fill lists, protecting and an protecting documents and cells.

Rearranging worksheets: Moving cells, copying cells, sorting cell data, inserting rows, inserting columns, inserting cells, inserting as you paste, deleting parts of a worksheet, clearing parts of a worksheet, how formulas react to worksheet design changes, auditing tools help spot potential problems.

Excel formatting tips and techniques: Excel page setup, changing column widths and row heights, auto format, manual formatting, using styles, forma codes alter a number's appearance, format printer speeds up format copying, changing font sizes and attributes, adjusting alignments, centering text across columns, using border

buttons and commands, changing colors and shading, inserting and removing page breaks, hiding rows and columns.

Organizing large projects: Using names, splitting windows and fixing titles, outlining your worksheets, working with multiple worksheets, using multiple worksheets in a workbook, viewing multiple windows, summarizing information from multiple worksheets.

An introduction to functions: Parts of a function, functions requiring add-ins, online functions help, the function wizard, examples of functions by category, error messages from functions.

Unit-2: EXCEL CHARTS, GRAPHICS AND FUNCTIONS Excel's chart features: chart parts and terminology, instant charts with the chart wizard, creating charts on separate worksheets, resizing and moving charts, adding chart notes and arrows, editing charts, rotating 3-D charts, changing worksheet values by drawing chart parts, printing charts, deleting charts, setting the default chart type, controlling which series on which axis, adding overlay charts, creating trend lines, data map.

Working with graphics in Excel: Creating and placing graphic objects, resizing graphics, positioning graphics on worksheets, drawing lines and shapes, examples of graphics, possible sources of excel graphics, excel slide shows.

Introduction to Excel's command macros: Recording your own macros, running macros, assigning macros to buttons.

Using worksheets as databases: Database concepts and terms, creating an excel database, working with data forms, filtering-a better way to find, sorting excel databases, cross-tabulating databases, adding subtotals to databases.

Automating what-if projects: General organizational tips, scenario manager, finding the right number with solver.

Auditing and troubleshooting worksheets: Using error values to locate problems, using iteration to solve circular references, using the info window to find errors, using the auditing command to trouble shoot.

Unit-3: MS ACCESS BASICS

Introduction to Access : Access concepts and terms, starting and quitting access, the access workspace and tools, the views.

Creating a simple database and tables: The access table wizard, creating databases without the wizard, field names, data types and properties, adding or deleting fields in tables, resizing fields, changing the appearance of text in tables, freezing columns, primary key fields, indexing fields, viewing a list of database properties.

Forms: The form wizard, saving forms, modifying forms.

Entering and editing data: Typing, adding records, duplicate previous entries without retyping, switching out of data entry mode, when do entries get saved?, undo, correcting entries, global replacements, moving from record to record in a table, entry and navigational shortcuts.

Finding, sorting and displaying data: Queries and dynasets, creating and using queries, returning to the query design, multiple search criteria, finding incomplete matches, using wildcards in queries, requesting range of records, hiding columns, reformatting dynasets, multilevel sorts, showing all records after a query, saving queries for latter use, cross tab queries, find and replace.

Unit-4: ACCESS REPORTS, FORMS AND GRAPHICS

Printing reports, forms, letters and labels: Simple table, forms, and database printing, defining advanced reports, manual reporting and modifying, modifying section contents, properties in reports, saving formula for reuse, printing mailing labels, changing label designs.

Relational databases: Flat versus relational, how relationships work, exercise: creating a simple relationship, types of relationships, defining and redefining relationships, deleting relationships, creating relationships.

Expressions, macros and other automation: Expressions, using expressions in reports, using expressions in queries, using expressions in forms, expression builders.

Graphics in databases: Objects: linked, embedded, bound and unbound, graphics as form and report embellishments, bound graphics in records, adding graphics to buttons, chart wizard: charting your data.

Linking, importing and exporting records: Importing versus linking, linking other databases as tables, importing data from spread sheet files, importing data from word files, exporting access data.

Unit-5: FUNDAMENTALS OF INTERNET

The Internet and the world wide web: Overview: What is Internet, the Internet's history, The Internet's major services, Understanding the world wide web, using your browser and the world wide web, navigating the web, closing your browser, getting help with your browser, searching the web, search results and web sites.

E-mail and other Internet Services: Overview: Communicating through the Internet, using e-mail, using an e-mail program, stopping out spam, using web-based e-mail services, more features of the Internet.

Connecting to the Internet: Overview: Joining the Internet phenomenon, connecting to the Internet through wires, how PC applications access the Internet, connecting to the Internet wireless.

Doing business in the online world: Overview: commerce on the world wide web, E-commerce at the consumer level, E-commerce at the business level, Business, the Internet and everything, telecommuters.

III BA/B.Com./B.Sc. Common Paper

Paper I :

Science, Technology & Development(Foundation Course - II)

Course Objectives :

CO1 : Learner will get the knowledge on Earth system

CO2 : Able to develop the concept on Evolution

CO3 : Gets general awareness about drugs

CO4 : Telecommunication types familiarity

Unit - I : Science :

1. Earth System : Characteristics features - Lithosphere, Hydrosphere - Atmosphere, Lithosphere- Soil Characteristics, texture, fertility and its control. Hydrosphere - Hydrological cycle - water bodies - ponds, lakes, rivers and their characteristics - Water consumption at global level and regional level - Management of water bodies. Atmosphere - Troposphere, Stratosphere, Ionosphere - Composition of air - Ozone - Ozone layer - its importance.
2. Life Sciences - Concepts of origin life - Evolution and diversity of life - Cell - Molecular basis of life and living forms - Mendelian concepts on inheritance - its impact on society - Blood - Blood groups - transfusion - Wild life and its conservation.
3. Chemical Science - The definitions, general awareness and importance of
 - i) Drugs - Antibiotics, Penicillin, Tetracycline, Sulpha Drugs, Anti - Malarials, Anti pyretics, Analgesics.
 - ii) Soaps and Detergents - Sources - mechanism of soap action - development of detergents - applications - disadvantages of detergents.
 - iii) Plastics and polymers - Polyethylene, polyvinylchloride (PVC), nylon 66 - rubber and synthetic rubber.
 - iv) Agrochemical and Fertilizers - Pesticides - Introduction - DDT, BHC, Malathion, Parathion - Fungicides - Rodenticides, Weedicides, Nitrogen and Phosphorus fertilizers - Microfertilizers, Bio - pesticides, neem and bacillus thuringensis.
 - v) Bio fertilizers - Applications and their affects on nature.
 - vi) Vitamins - Natural sources - importance - deficiencies (Structure and preparation methods for the syllabus mentioned in (i) to (iv) are excluded).

Unit - II : Technology and Development :

1. Communication - Definition, nature and concept of communication role of communication in society. Types of Communication - Intrapersonal, Interpersonal, group and mass communication. Traditional and folk forms of communication in India. New Media technologies - Satellite, Cable and Internet. Process of Communication : Functions of communication, elements and barriers of communication. Mass Media - Press, Radio, TV and Films. Functions of mass communication. Transport - Wheel, Steam, Engine, Automobile, Ship, Airplane. Comparison of Road, Rail, Water and Air transports in terms of infrastructure, speed, costs etc.
2. Energy - Sources - Renewable sources of energy - Non - renewable sources of energy - Conventional energy sources - non conventional energy- wind, water, tidal, Solar, geothermal, atomic energy, bio - fuels - sources and their applications - Energy Management - Energy Conservation - Future needs of energy.
3. Health - Problems - Sex education - Venereal diseases, AIDS, General Protozoan, Bacterial & Viral diseases.
4. Bio - Technology - Introduction - Applications - health and Human welfare - Agriculture - Mush- room culture - Medical Plants.
5. Green Revolution - Introduction - Types of crops developed in green revolution.
6. Food Technology - Introduction - Food processing - Methods of processing - Food preservation and methods of preservation.
7. National institutions (Science) - Institutions imparting education - Institutions performing research and development - Role of Scientific institutions in Research, Technology and Development.

B.A./B.Sc Mathematics

Mathematics Paper-1

DIFFERENTIAL EQUATIONS & SOLID GEOMETRY

DIFFERENTIAL EQUATIONS

Course Objectives:

1. Solve linear differential equations.
2. Convert non exact homogeneous equations to exact differential equations by using integrating factors.
3. Know the methods of finding solutions of differential equations of the first order but not of the first degree.
4. Solve higher-order linear differential equations, both homogeneous and non homogeneous, with constant coefficients.
5. Understand the concept and apply appropriate methods for solving differential equations.
6. Get the knowledge of planes.
7. Basic idea of lines, sphere and cones.
8. Understand the properties of planes, lines, spheres and cones.
9. Express the problems geometrically and then to get the solution.

Unit – I: Differential equations of first order and first degree

Linear differential equations, Differential equations reducible to linear form Exact differential equations Integrating factor Change of variables Simultaneous differential equations: Orthogonal trajectories

Differential equations of the first order but not of first degree:

Equations solvable for y . Equations solvable for x . Equations solvable for x and y , Equations that do not contain x (or y), Equations of the first degree in x and y -Clairaut's equation.

UNIT-II: Higher order linear differential equations

Solution of homogeneous linear differential equations of order n with constant coefficients. Solution of the non-homogeneous linear differential equations with constant coefficients by means of operations Method of undetermined coefficients; Method of variation of parameters. Linear differential equations with non-constant coefficients, The Cauchy-Euler equation

System of linear differential equations:

Solution of a system of linear equations with constant coefficients; A non equivalent triangular system Degenerate Case $\rho_1(D)\rho_4(D)-P_2(D)P_3(D)=0$

SOLID GEOMETRY

UNIT-III: The Plane

Equation of plane in terms of its intercepts on the axis. Equations of the plane through the given points, Length of the perpendicular from a given point to a given plane. Bisectors of angles between planes, Combined equation of two planes. Orthogonal projection on a plane.

The Line:

Equation of a line, Angle between a line and a plane. The condition that a given line given plane. The condition that no given lines are coplanar. Number of arbitrary constants in the straight line. Sets of conditions which determine a line. The shortest distance between two lines length and equations of the line of shortest distance between two straight lines. Length of the perpendicular from a given point to a given line. Intersection of three planes. Triangular Prism

The Sphere:

Definition and equation of the sphere. Equation of the sphere through four given points. Plane sections of a sphere. Intersection of two spheres: Equation of a circle. Sphere through a given circle, Intersection of a sphere and a line Power of a point. Tangent plane. Plane of contact. Polar plane.

Pole of a plane, Conjugate points, Conjugate planes Angle of intersection of two spheres Conditions for two spheres to be orthogonal, Radical plane. Coaxial system of spheres: Simplified form of the equation of two spheres.

UNIT-IV:

Cones, Cylinders and conicoids:

Definitions of a cone vertex guiding curve, generators Equation of the cone with a given vertex and guiding curve. Enveloping cone of a sphere Equations of cone with vertex at origin are homogeneous. Conditions that the general equation of the second degree should represent a cone. Condition that a cone may have three mutually perpendicular generators Intersection of a line and cone. Tangent lines and tangent plane at a point Condition that a plane may touch a conic. Reciprocal cones Intersection of two cones with a given vertex, axis and semi-angle.

Definition of a cylinder, Equation of the cylinder whose generators intersect a given conic and are parallel to a given line, Enveloping cylinder of a sphere. The right circular cylinder Equation of the right circular cylinder with a given axis and radius.

The general equation of the second degree and the various surfaces represented by it, Shapes of some surfaces. Nature of Ellipsoid. Nature of Hyperboloid of one sheet.

Practicals Paper

1. Integrating Factors
2. Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$
(Method of Grouping)
3. Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$
(Method of Multipliers)
4. Equations of First Order and First Degree
(Clairaut's Equation)
5. Differential Equations with Constant Coefficients
[Where $Q = be^{ax}$ (or) $Q = b \sin x$ (or) $b \cos x$]
6. Linear Differential Equations with Constant Coefficients
[When $Q = e^{ax}v$ (or) $Q = xv$]
7. Linear Differential Equations with Constant Coefficients
[When $Q = bx^k$]
8. Solutions of Differential Equations by the Method of Undetermined Coefficients
9. "Bisectors of Angles Between two Planes"
10. The Length and Equations of the Line of Shortest Distance Between two Straight Lines
11. "Sphere Through a Given Circle"
12. Angle of intersection of two Spheres
13. Condition that the General Equation of the Second Degree Should Represent a Cone
14. Reciprocal Cones
15. Right Circular Cone
16. The Right Circular Cylinders Equation of Right Circular Cylinders

PAPER – II :ABSTRACT ALGEBRA & REAL ANALYSIS

Course Objectives

1. Acquire the basic knowledge and structure of groups, subgroups and cyclic groups.
2. Get the significance of the notation of a normal subgroups.
3. Get the behavior of permutations and operations on them.
4. Study the homomorphisms and isomorphisms with applications.
5. Get a clear idea about the real numbers and real valued functions.
6. Obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence/ series.
7. Test the continuity and differentiability and Riemann integration of a function.
8. Know the geometrical interpretation of mean value theorems.
9. Understand the ring theory concepts with the help of knowledge in group theory and to prove the theorems.
10. Understand the applications of ring theory in various fields.

UNIT-I: GROUPS:

Binary operations-Definitions and properties, Groups--Definition and elementary properties, Finite groups and group composition tables, Subgroups and cyclic subgroups Permutation Functions and permutations groups of permutations, cycles and cyclic notation, even and odd permutations. The alternating groups. Cyclic groups-Elementary properties. The classification of cyclic groups, sub groups of finite cyclic groups. Isomorphism-Definition and elementary properties, Cayley's theorem, Groups of cosets, Applications, Normal subgroups-Factor groups. Criteria for the existence of a coset group, Inner automorphisms and normal subgroups, factor groups and simple groups. Homomorphism Definition and elementary properties. The fundamental theorem of homomorphisms, applications

UNIT-II:RINGS:

Definition and basic properties, Fields, Integral domains, divisors of zero and Cancellation laws Integral domain. The characteristic of a ring some non commutative rings, Examples, Matrices over a field. The real quaternions Homomorphism of Rings - Definition and elementary properties, Maximal and Prime ideals, Prime fields

UNIT-III:REAL NUMBERS:

The Completeness Properties of $\mathbb{R}$, Applications of the Supremum Property. (No question is to be set from this portion)

Sequences and Series Sequences and their limits, limit theorems, Monotonic Sequences Sub-sequences and the Bolzano-Weinstrass theorem, The Cuchy's Criterion Properly divergent sequences, Introduction series, Absolute convergence, test for absolute convergence, test for non-absolute convergence Continuous Functions, continuous functions, combinations of continous functions. continuous functions on intervals, Uniform continuity.

UNIT-IV:DIFFERENTIATION AND INTEGRATION:

The derivative, The mean value theorems, 'Hospital Rule, Taylor's Theorem.

Riemann integration Riemann integral, Riemann integrable functions,theorem.

IInd Year MATHS, PRACTICAL**Unit – 1:**

1 Permutations and Group of Permutations

2(a)Cyclic Groups-Basic Properties

2(b)Cyclic Groups-Classification of Cyclic Groups

Unit – 2:

3. Integral domains

4. Fields

5. Characteristics of a Ring

6. Non-Commutative Rings

7. Evaluation of Homomorphisms

8.Division Algorithm in $F(x)$

Unit-3

9. Sequences and their Limits

10. Series on Real Numbers

11.Limits of Functions

12. Continuous Functions

Unit - 4

13.Mean Value Theorems

14. Hospital's Rule

15. Riemann Sums

SYLLABUS
MATHEMATICS SYLLABUS B.A./B.Sc
LINEAR ALGEBRA AND VECTOR CALCULUS
Paper- III

Course Objectives

1. Understand the concepts of vector spaces, subspaces, basis, dimension and their properties.
2. Understand the concepts of linear transformations and their properties
3. Apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods 4. Learn the properties of inner product spaces and determine orthogonality in inner product spaces.
4. Learn multiple integrals as a natural extension of a definite integral to a function of two variables in the case of double integral / three variables in the case of triple integral.
5. Learn applications in terms of finding surface area by double integral and volume by triple integral.
6. Determine the gradient, divergence and curl of a vector and vector identities.
7. Evaluate line, surface and volume integrals.
8. Understand relation between surface and volume integrals (Gauss divergence theorem), relation between line integral and volume integral (Green's theorem), relation between line and surface integral (Stokes theorem).

Unit-1:

Vector spaces General properties of vector spaces, Vector subspaces, Algebra of subspaces, linear combination of vectors Linear span, linear un of two subspaces, Linear dependence and independence of vectors, Basis of vector space, Finite dimensional vector spaces, Dimension of a vector space, Dimension of a space, Linear transformations, linear operators, Range and null space of linear transformation, Rank and nullity of linear transformations, Linear transformations as vectors, Product of linear transformations Invertible lines transformation

Unit-II:

The adjoint or transpose of a linear transformation, Sylvester's law of nullity, characteristic vales and characteristic vectors, Cayley-Hamilton theorem, Diagonalizable operators. Inner product spaces, Euclidean and unitary spaces, Norm or length of a vector, Schwartz Inequality, Orthogonality, Orthonormal set, complete orthonormal set, Gram-Schmidt orthogonalisation process

Part B: Multiple integrals and Vector Calculus

Unit-III:

Multiple integrals: Introduction, the concept of a plane, Curve, line integral-Sufficient condition for the existence of the integral The iris of a subset of R^2 , Calculation of double Integrals, Jordan curve, Area, Change of the order of integration, Double integral as a limit, Change of variable in a double integration

Unit-IV:

Vector differentiation. Ordinary derivatives of vectors, Space curves, Continuity, Differentiability, Gradient, Divergence, Curl operators, Formulae involving these operators. Vector integration, Theorems of Gauss and Stokes, Green's theorem in plane and applications of these theorems.

IIIrd Year Paper III MATHS, PRACTICAL

Unit-I

1. Vector spaces
2. Sub spaces
3. Linear combination Dependence and Independence of Vectors
4. Basis of Dimension
5. Linear transformations
6. Range, Null space and Nullity of a Linear transformation

Unit – II

7. Characteristics roots and the corresponding vectors
8. Cayley-Hamilton Theorem
9. Inner product spaces
10. Orthogonality

Unit – III

11. Change of Order of Integration and Change of Variable of Integration in a Double Integral
12. Differential Operators

Unit-IV

13. Integral Transforms (Gauss Divergence Theorem)
14. Integral Transforms (Green's Theorem)
15. Integral Transforms (Stoke's Theorem)

SYLLABUS
BA/B.Sc. ACADEMIC YEAR 2011-12
Mathematics: Paper IV
NUMERICAL ANALYSIS

Course Objectives

1. Understand various finite difference concepts and interpolation methods.
2. Find numerical solutions of ordinary differential equations by using various numerical methods.
3. Analyze and evaluate the accuracy of numerical methods.
4. Analyze and evaluate the accuracy of numerical methods.
5. Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.
6. Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.
7. Find numerical solutions of ordinary differential equations by using various numerical methods
8. Analyze and evaluate the accuracy of numerical methods.
9. Acquire basic knowledge in solving interpolation with equal interval problems by various numerical methods. Estimate the missing terms through interpolation methods.
10. Develop skills in analyzing the methods of interpolating a given data, properties of interpolation with unequal intervals and derive conclusions, approximate a function using an appropriate numerical method.
11. Be able to derive Least – Squares curve fitting procedures, fitting a straight line, fitting a parabola, nonlinear curve fitting, Curve fitting by a sum of exponentials.
12. Be able to find the solution of ordinary differential equations of first order by Euler, Taylor and Runge-Kutta methods.

UNIT-I

Errors in Numerical computations: Numbers and their Accuracy, Errors and their Computation, Absolute. Relative and percentage errors. A general error formula. Error in a series approximation. Solution of Algebraic and Transcendental Equations: The bisection method. The Iteration method. The method of false position, Newton-Raphson method, Generalized Newton-Raphson method, Ramanujan's method, Muller's method

UNIT-II:

Interpolation: Errors in polynomial interpolation, Forward differences, Backward differences, Central Differences, Symbolic relations, Detection of errors by use of D. Tables, Differences of a polynomial Newton's formulae for interpolation formulae,

Gauss's central difference formula, Stirling's central difference formula, Interpolation with unevenly spaced points, Lagrange's formula, Error in Lagrange's formula, Derivation of governing equations, End conditions, Divided differences and their properties. Newton's general interpolation

UNIT-III:

Curve Fitting: Least Squares curve fitting procedures, fitting a straight line, non-linear curve fitting. Curve fitting by a sum of exponentials Numerical Differentiation and Numerical Integration: Numerical differentiation, Errors in numerical differentiation. Maximum and minimum values of a tabulated function, Numerical integration, Trapezoidal rule, Simpson's 1/3-rule, Simpson's 3/8-rule, Boole's and Weddle's rule.

UNIT-IV:

Linear systems of equations, Solution of linear systems Direct methods, Matrix L inversion method, Gaussian elimination method, Method of factorization, Ill-conditioned linear systems. Iterative methods: Jacobi's method, Gauss-Seidel method, Numerical solution of ordinary differential equations: Introduction, Solution by Taylor's Series, Picard's method of successive approximations. Euler's method, Modified Euler's method, Runge-Kutta methods, Predictor - Corrector methods, Milne's method.

Practicals Paper

1. Errors Bisection and Ramanujan's Method
2. Regular fals: and Newton's Raphson's methods.
3. Forward Backward Tabues and Hissing and Terms
4. Newton forward backward formula Lagrange's and Newton's divided formula.
5. Gausse forward and Gausse backward formula
6. Sterling, Bassel and Laplace Everett's formula
7. Fitting of Straight line and Parabola
8. Fitting of a power curve and exponential curve
9. Numerical integration : trapezoidal and Simpson's 1/3 rule
10. Numerical integrations: Simpson's 3/8 Rule and Weddle's Rule
11. Double integration and Romberg integration
12. Numerical solution: Euler's, Euler's modified and Taylor's series
13. Numerical solution: Picard's and R-K method
14. MILINE, GAUSS Elimination and factorization method
15. Gauss Jacobi, Gauss – Seidel Method

BA/B.Sc. I Year: Statistics Syllabus
B.Sc. 1 Year: Statistics Syllabus
Paper: 1- Probability Theory and Distributions

Course Objectives

1. The objective of this paper is to throw light on the role of statistics in different fields with special reference to business and economics
2. it gives the students to review good practice in presentation and the format most applicable to their own data
3. The measures of central tendency or averages reduce the data to a single value which is highly useful for making comparative studies
4. The Measures of dispersion throw light on reliability of average and control of variability.
5. This paper deals with the situation where there is uncertainty and how to measure that uncertainty by defining the probability, random variable and mathematical Expectation which are essential in all Research areas
6. The paper gives an idea of using various standard theoretical Distributions, their chief characteristics and applications in analyzing any data

Unit-1

Descriptive Statistics: Concept of primary and secondary data. Methods of collection and editing of primary data. Designing a questionnaire and a schedule. Sources and editing of secondary data. Classification and tabulation of data. Measures of central tendency (mean, median, mode, geometric mean and harmonic mean) with simple application. Absolute and relative measures of dispersion (range, quartile deviation, mean deviation and standard deviation) with Simple applications Importance of moments, central and non-central moments, and their interrelationships, Sheppard's corrections for moments for grouped data. Measurements of skewness based on quartiles and moments and kurtosis based on moments with real life examples.

Probability: Basic concepts in probability deterministic and random experiments, trial, outcome, sample space, event, and operations of events, mutually exclusive and exhaustive events, and equally likely and favourable outcomes with examples. Mathematical, statistical and axiomatic definitions of probability with merits and demerits. Properties of probability based on axiomatic definition. Conditional probability and independence of events. Addition and multiplication theorems for n events. Boole's inequality and Boole's theorem. Problem on probability using counting methods and theorems.

UNIT-II

Random Variables: Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass function and probability density function with illustrations. Distribution function and its properties. Transformation of one-dimensional - random variable (simple 1-1 functions only). Notion of bivariate random variable, bivariate distribution and statement of its properties. Joint, marginal and conditional distributions. Independence of random variables.

Mathematical Expectation: Mathematical expectation of a function of a random variable. Raw and central moments and covariance using mathematical expectation with examples. Addition and multiplication theorems of expectation. Definition of moment generating function. (m.g.f), cumulant generating function (c.g.f), probability generating function (p.g.f) and characteristic function (c.f) and statements of their properties with applications. Chebyshev's, and Cauchy- Schwartz's inequalities and their applications.

Statement and applications of weak law of large numbers and central limit theorem for identically and independently distributed (i.i.d) random variable with finite variance.

UNIT-III

Discrete distributions: Uniform, Bernoulli, Binomial, Poisson, Negative binomial, Geo metric and Hyper-geometric mean and variance only) distributions. Properties of these distributions such as m.g.f.c.g.f.p.g.f, and moments up to fourth order and their real life applications Reproductive property wherever exists. Binomial approximation to Hyper-geometric, Poisson approximation to Binomial and Negative binomial distributions.

UNIT-IV

Continuous distributions-Rectangular and Normal distributions. Normal distribution as a limiting case of Binomial and Poisson distributions. Exponential, Gamma, Beta of two kinds (mean and variance only) and Cauchy (definition and c.f. only) distributions. Properties of these distributions such as m. g. f. c. g. f. c. f. and moments up to fourth order, their real life applications and reproductive and reproductive productive property wherever exists.

Practical Paper

1. Basics of Excel-data entry, editing and saving, establishing and copying a formulae, built in functions in excel, copy and paste and exporting to MS word document.
2. Graphical presentation of data (Histogram, frequency polygon, Ogives)
3. Graphical presentation of data (Histogram, frequency polygon, Ogives) using MS Excel
4. Diagrammatic presentation of data (Bar and Pic)

5. Diagrammatic presentation of data (Bar and Pie) using MS Excel
6. Computation of non-central and central moments-Sheppard's corrections for grouped data.
7. Computation of coefficients of Skewness and Kurtosis-Karl Pearson's and Bowel's β_1 and β_2 .
8. Computation of measures of central tendency, dispersion and coefficients of Skewness, Kurtosis using MS Excel
9. Fitting of Binomial Distribution-Direct method.
10. Fitting of Binomial distribution-Direct method using MS Excel.
11. Fitting of binomial distribution-Recurrence relation Method
12. Fitting of Poisson distribution-Direct method.
13. Fitting of Poisson Distribution-Direct method using MS Excel.
14. Fitting of Poisson distribution-Recurrence relation Method.
15. Fitting of Negative Binomial distribution
16. Fitting of Geometric distribution.
17. Fitting of Normal distribution-Areas method.
18. Fitting of Normal distribution-Ordinates method.
19. Fitting of Exponential distribution
20. Fitting of Exponential Distribution using MS Excel.
21. Fitting of a Cauchy distribution.
22. Fitting of a Cauchy distribution using MS Excel

Note: Training shall be on establishing formulae in Excel cells and derive the results.
The excel output shall be exported to MS word for writing inference.

**BA/B.Sc. II Year: Statistics Syllabus
(With Mathematics Combination)
(Examination at the end of II Year)
Paper-II: STATISTICAL METHODS AND INFERENCE**

Course Objectives

1. The concept of correlation and Linear Regression deals with studying the Linear relationship between two or more variable, which is needed to analyze the real life problems.
2. The Attributes gives an idea that how to deal with qualitative data
3. This paper deals with standard sampling Distribution like chi- square, t, F and their characteristics and applications
4. This paper deals with the different techniques of point estimation for estimating the parameter values of population and interval estimation for population parameters
5. In This paper, various topics of Inferential statistics such as Interval estimation, Testing of Hypothesis, large sample tests, small sample tests and Non - parametric tests. These techniques play an important role in many fields like pharmaceutical, agricultural ,medical etc

Unit – 1:

Population correlation coefficient and its properties Bivariate data, scattered diagram, sample correlation coefficient, computation of correlation coefficient for grouped data. Correlation ratio, Spearman's rank correlation coefficient and its properties. Principle of least squares, simple linear regression, correlation verses regression, properties of regression coefficients Fitting of quadratic and power curves Concepts of partial and multiple correlation coefficients (only for three variables). Analysis of categorical data, independence and association and partial association of attributes, various measures of association (Yale's) for two way data and coefficient of contingency (Pearson and Tcherprow), coefficient of colligation.

Unit – 2:

Concepts of population, parameter, random sample, statistic, sampling distribution and standard error. Standard error of sample means) and sample proportion(s). Exact sampling distributions-Statement and properties of t and F distributions and their interrelationships. Independence of sample mean and variance in random sampling from normal distributions

Point estimation of a parameter, concept of bias and mean square error of an estimate Criteria of good estimator- consistency, unbiasedness, efficiency and sufficiency with examples Statement of Neyman's Factorization theorem, derivations of sufficient statistics in case of Binomial, Poisson, Normal and Exponential (one

parameter only) distribution Estimation by method of moments, Maximum likelihood (ML), statements of asymptotic properties of MLE. Concept of interval estimation. Confidence intervals of the parameters of normal population by Pivot method.

Unit -- 3

Concepts of statistical hypotheses, null and alternative hypothesis, critical region, two types of errors, level of significance and power of a test One and two tailed tests, test function (non-randomized and randomized) Neyman-Pearson's fundamental lemma le Randomized tests. Examples in case of Binomial, Poisson, Exponential and Normal distributions and their powers. Use of central limit theorem in testing. Large sample tests and confidence intervals for mean(s), proportion(s), standard deviation(s) and correlation coefficient(s).

Unit - IV

Tests of significance based on χ^2 , t and F, χ^2 -test for goodness of fit and test for independence of attributes Definition of order statistics and statement of their distributions Non-parametric tests- their advantages and disadvantages, comparison with parametric tests Measurement scale- nominal, ordinal, interval and ratio. One sample runs test, sign test and Wilcoxon-signed rank tests (single and paired samples). Two independent sample tests: Median test, Wilcoxon-Mann-Whitney U test, Wald Wolfowitz's runs test.

Practical Paper-II

1. Generation of random samples from Uniform (0,1), Uniform (a,b) and exponential distributions.
2. Generation of random samples from Normal and Poisson distributions
3. Simulation of random samples from Uniform (0,1), Uniform (a,b), Exponential, Normal and Poisson distributions using MS Excel.
4. Fitting of straight line and parabola by the method of least squares
5. Fitting of straight line and parabola by the method of least squares using MS Excel.
6. Fitting of power curves of the type $y = ax^b$, $y = ab^x$ and $y = ae^{bx}$ by the method of least squares
7. Fitting of power curves of the type $y = ax^b$, $y = ab^x$ and $y = ae^{bx}$ by the method of least squares using MS Excel.
8. Computation of Yule's coefficient of association.
9. Computation of Pearson's, Teherprows coefficient of contingency.
10. Computation of correlation coefficient and regression lines for ungrouped data.
11. Computation of correlation coefficient, forming regression lines for ungrouped data.

12. Computation of correlation coefficient, forming regression lines for grouped data.
13. Computation of correlation coefficient, forming regression lines using MS Excel.
14. Computation of multiple and partial correlation coefficients.
15. Computation of multiple and partial correlation coefficients using MS Excel.
16. Computation of correlation ratio
17. Large sample tests for mean(s), proportion(s), Standard deviation(s) and correlation coefficient.
18. Small sample tests for single mean and difference of means and correlation coefficient Paired t-test.
19. Small sample tests for mean(s), paired t-test and correlation coefficient using MS Excel.
20. Small sample test for single and difference of variances.
21. Small sample test for single and difference of variances using MS Excel.
22. χ^2 -test for goodness of fit and independence of attributes.
23. χ^2 -test for goodness of fit and independence of attributes using MS Excel.
24. Nonparametric tests for single and related samples (sign test and Wilcoxon signed rank test) and one sample runs test.
25. Nonparametric tests for two independent samples (Median test, Wilcoxon Mann Whitney U test, Wald- Wolfowitz's runs test)

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MSWord for writing inferences.

**BA/B.Sc. III Year: Statistics Syllabus
(With Mathematics Combination)
(Examination at the end of III Year)
Paper-III: APPLIED STATISTICS**

Course Objectives

1. The Sampling techniques deals with the ways and Methods that should be used to draw samples to obtain the optimum results
2. This paper throw light on understanding the variability between group and within group through Analysis of variance
3. This gives an idea of Logical construction of Experimental Design and applications of these designs nowadays in various research areas
4. The time series on simple description Methods of data, explains the variation, forecasting the future values, control procedures.
5. This paper gives an idea of index numbers in a range of practical situations, limitations and uses
6. The vital statistics enlighten the students in obtaining different mortality, Fertility rates thus obtaining the population growth rates and construction and use of Life tables in actuarial science

Unit – 1: Design of Sample Surveys:

Concepts of population, sample sampling unit, parameter, statistic, sampling errors, sampling distribution, sample frame and standard error. Principal steps in sample surveys-need for sampling, census versus sample surveys, sampling and non-sampling errors, sources and treatment of non-sampling error, advantages and limitations of sampling.

Types of sampling: Subjective, probability and mixed sampling methods. Methods of drawing random samples with and without replacement. Estimates of population mean, total, and proportion, their variances and the estimates of variances in the following

- i. SRSWR and SRSWOR
 - ii. Stratified random sampling with proportional and Neyman allocation, and
 - iii. Systematic sampling when $N = nk$.
- Comparison of relative efficiencies. Advantages and disadvantages of above methods of sampling

Unit – 2: Analysis of Variance and Design of Experiments

ANOVA-one-way, two-way classifications with one observation per cell-concept of Gauss-Markoff linear model, statement of Cochran's theorem, concept of fixed effect del and random effect model. Expectation of various sums of squares.

Mathematical analysis, importance and applications of design of experiments, Principles of experimentation, Analysis of Completely randomized Design (C.R.D), Randomized Block Design (R.B.D) and Latin Square Design (LSD) including one missing observation, expectation of various sum of squares. Comparison of the efficiencies of above designs.

Unit – 3: Time series:

Time series and its components with illustrations, additive, multiplicative and mixed models. Determination of trend by least squares, moving average methods. Growth curves and their fitting- Modified exponential, Gompertz and Logistic curves.

Determination of seasonal indices by Ratio to moving average, ratio to trend and link relative methods.

Index Numbers

Concept, construction and limitations of simple and weighted index numbers Laspeyres's, Paasche's and Fisher's index numbers, criterion of a good index where, problems involved in the construction of index numbers. Fisher's index as ideal number Fixed and chain base index numbers. Cost of living index numbers and wholesale price index numbers. Base shifting, splicing and deflation of index numbers

Official Statistics

Functions and organization of CSO and NSSO, Agricultural Statistics, area and yield statistics. National Income and its computation, utility and difficulties in estimation of national income.

Unit – 4: Vital statistics:

Introduction, definition and uses of vital statistics. Sources of vital statistics registration method and census method. Rates and ratios, Crude death rates, ratios specific death rate, standardized death rates, crude birth rate, age specific fertility rate, general fertility rate, total fertility rate. Measurement of population growth, crude rate natural increase- Pearl's vital index Gross reproductive rate and Net reproductive tables, construction and uses of life tables and Abridged life tables.

Demand analysis

Introduction, Demand and supply, price elasticity of supply and demand. Methods of determining demand and supply curves, Leontief's, Pigou's methods of determining demand curve from time series data, limitations of these methods Pigou's method from time series data. Pareto law of income distribution curves of concentration

PRACTICAL PAPER-

Sampling Techniques:

1. Simple random sampling-Estimation of population mean, population total and their standard errors
2. Stratified random sampling-Estimation of population mean, population total and their Standard errors
3. Systematic sampling-Estimation of population mean population total their standard errors:

Design of Experiments:

4. Analysis of completely randomized design
5. Analysis of Randomized block design
6. Analysis of RBD with missing observations
7. Analysis of Latin square design
8. Comparison of relative efficiencies LSD with RBD and CRD

Time Series Analysis:

9. (a) Calculation of trend values by the method of Least squares-Straight line
- 9 (b) Calculation of trend values by the method of Least squares-Parabola fit.
- 10.(a) Calculation of trend by moving averages method
- 10.(b) Calculation of trend by centering of moving averages method 11
- 11.Determination of seasonal indices by the method of link relatives
- 12.Determination of seasonal indices by the method of link relatives

Index Numbers:

13. Calculation of simple index numbers
14. Calculation of weighted index numbers
15. Calculation of cost of living index numbers
16. Conversion of Foxed base index number into Cham base index number vice-versa

Vital Statistics

17. Measurement of mortality
18. Measurement of fertility
19. Construction of life tables
20. Measurement of population growth

Demand Analysis

21. Construction of Lorenz Curve

**B.A/B.Sc. III Year: Statistics Syllabus
(With Mathematics Combination)
(Examination at the end of III Year)**

Paper-IV: QUALITY, RELIABILITY AND OPERATIONS RESEARCH

Course Objectives

1. To understand the concept of Quality, process control and product control using control chart techniques and sampling inspection plan.
2. To have an idea about Quality management, Quality circles, Quality movement and standardization for Quality
3. To speak about Quality awareness in industry
4. To have a path to an industry to meet the standards
5. Operation Research introduce the basic concepts of Operational Research and Linear programming to the students
6. To link the OR techniques with business environment and life sciences
7. To enrich the knowledge of students with advanced techniques of Linear programming problem along with real life applications
8. To minimize the total elapsed time in an industry by efficient allocation of jobs to the suitable persons

Unit-1

Importance of SQC in industry. Statistical basis of Shewart control charts Construction of control charts for variables (mean, range and standard deviation) and attributes (p, np, and c-charts with fixed and varying sample sizes) Interpretation of control charts. Natural tolerance limits and specification limits, process capability index Concept of Six sigma and its importance

Unit-II

Acceptance sampling plan: Producers risk and consumer's risk. Concept of AQL and LTPD. Single and Double sampling plans for attributes and derivation of their OC and ASN functions. Design of single and double sampling plans for attributes using Binomial

Reliability: Introduction. Hazard function, Exponential distribution as life model, its memory- less property Reliability function and its estimation. Concepts of censoring and truncation System reliability series, parallel and k out of N systems and their reliabilities.

Unit-III

Linear Programming: Meaning and scope of OR. Convex sets and their properties. Definition of general LPP. Formulation of LPP. Solution of LPP by graphical method, Fundamental theorem of LPP. Simplex algorithm. Concept of artificial variables. Big-M/Penalty method and two-phase simplex methods. Concept of degeneracy and resolving it, Concept of duality, duality as LPP. Dual Primal relationship Statement of Fundamental theorem of duality. Dual simplex method.

Unit -IV

Transportation, Assignment and Sequencing Problems: Definition of transportation problems, TPP as a special case of LPP. feasible solutions by North West and Matrix minimum methods and VAM. Optimal solution through MODI tableau and stepping stone method for balanced and unbalanced transportation problem. Degeneracy in TP and resolving it. Transshipment problem. Formulation and description of Assignment problem and its variations Assignment problem as special case of TP and LPP Unbalanced assignment problem, traveling salesman problem Optimal solution using Hungarian method.

Problem of Sequencing Optimal sequence of N jobs on two and three machines without passing

Practical's syllabus

1. Construction of Mom, Range and standard deviation Charts
2. Construction of PNP and C Chart with fixed and varying sample sizes
3. Construction of OC and ASN Curves
4. Computation of Reliability for Parallel and K out of System
5. Formulation of Lines Programming problem
6. Solving Linear Programming Problem using Graphical Method
7. Solving LPP With simplex Method
8. Solving LPP BY BIG-M Method
9. Solving LPP By two phase Method
10. Solving LPP Using Duality
11. Solving LPP Using Dual simplex Method
12. Transportation Problem-Finding LBF5 By Vogel's Approximation Method
13. Finding LBFS By Net-West Corner rule and Matrix Minima Method
14. Finding optimal solutions By UV Method (O) Mod Method
15. Formulation and Solution of assignment Problem Using Hungarian Method
16. Unbalanced Assignment Problem
17. Solution of Travelling Sale Problem
18. Solution of Sequencing Problem - Processing n Jobs through Two Machines and Processing OF n Jobs through the Machines

Computer Science
B.Sc. I Year
Part I: PC Software and 'C' Programming

Course Objectives

This course aims at providing exposure to students in skill development towards basic office applications.

CO1: Demonstrate basic understanding of computer hardware and software.

CO2: Apply skills and concepts for basic use of a computer.

CO3: Identify appropriate tool of MS office to prepare basic documents, charts, spreadsheets, and presentations.

CO4: Create personal, academic, and business documents using MS office.

CO5: Create spreadsheets, charts, and presentations.

CO6: Analyze data using charts and spread sheets.

Unit – 1: Fundamentals of Computers

Computer definition – Types of Computer – Logical Organization of a Digital Computer – Memory: Main Memory : RAM, ROM and Cache – Secondary Memory : Magnetic type, Floppy disk, Hard disk, Compact disk – Input devices – Output devices – Operating system : Definition, functions of an operating system, Types of Operating systems : Brief details of batch processing, Multi Programming, multi-tasking, time sharing, real time operating systems - Introduction to DOS, DOS internal commands, DOS External Commands – Introduction to Windows, Desktop, File, Folder, My Computer, My documents, Recycle bin, Internet Explorer, Windows Explorer – Types of Programming Languages.

Unit - 2: MS Word and MS Power Point

Word Basics: Starting word, creating a new document, Opening preexisting document, The parts of a word window, Typing text, Selecting text, Deleting text, Undo, Redo, Repeat, Inserting text, Replacing text, Formatting text, Cut, Copy, Paste – Printing.

Formatting Your Text and Documents: Auto format, Line spacing, Margins, Borders and Shading.

Working with Headers and Footers: Definition of headers and footers, creating basic headers and footers, creating different headers and footers for odd and even pages.

Tables: Creating a simple table, Creating a table using the table menu, Entering and editing text in a table, selecting in table, adding rows, changing row heights, Deleting rows, Inserting columns, Deleting columns, changing column width .

Graphics: Importing graphics, Clipart, Insert picture, Clip Art Gallery, using word's drawing features, drawing objects, text in drawing.

Templates: Template types, using templates, exploring templates, modifying templates. Macros: Macro, Recording macros, editing macros, running macro.

Mail Merge: Mail Merge concept, Main document, data sources, merging data source and main document. Overview of word menu options word basic tool bar.

Power Point: Basics, Terminology, Getting started, Views.

Creating Presentations : Using auto content wizard, Using blank presentation option, Using design template option, Adding slides, Deleting a slide, Importing Images from the outside world, Drawing in power point, Transition and build effects, Deleting a slide, Numbering a slide, Saving presentation, Closing presentation, Printing presentation elements.

Word Basics: Starting word, Creating a new document, Opening preexisting document, The parts of a word window, Typing text, Selecting text, Deleting

text, Undo, Redo, Repeat, Inserting text, Replacing text, Formatting text, Cut, Copy, Paste – Printing.

Formatting Your Text and Documents: Auto format, Line spacing, Margins, Borders and Shading.

Working with Headers and Footers: Definition of headers and footers, creating basic headers and footers, creating different headers and footers for odd and even pages.

Tables: Creating a simple table, Creating a table using the table menu, Entering and editing text in a table, selecting in table, adding rows, changing row heights, Deleting rows, Inserting columns, Deleting columns, changing column width .

Graphics: Importing graphics, Clipart, Insert picture, Clip Art Gallery, using word's drawing features, drawing objects, text in drawing.

Templates: Template types, using templates, exploring templates, modifying templates. Macros: Macro, Recording macros, editing macros, running a macro.

Mail Merge: Mail Merge concept, Main document, data sources, merging data source and main document. Overview of word menu options word basic tool bar.

Power Point: Basics, Terminology, Getting started, Views

Creating Presentations: Using auto content wizard, using blank presentation option, using design template option, Adding slides, Deleting a slide, Importing Images from the outside world, Drawing in power point, Transition and build effects, Deleting a slide, Numbering a slide, Saving presentation, Closing presentation, Printing presentation elements.

Unit - 3: MS Excel and MS Access

MS Access

Creating a Simple Database and Tables: Creating a contacts Databases with

the wiz, The Access Table Wizard, Creating Database Tables without the wizard, Field Names, Data Types and Properties, Adding, deleting fields, renaming the fields in a table.

Forms: The Form Wizard, Saving Forms, Modifying Forms

Entering and Editing Data: Adding Records, Duplicating previous entries without Retyping, Undo, Correcting Entries, Global Replacements, Moving from Record to Record in a table.

Finding, Sorting and Displaying Data: Queries and Dynasets, Creating and using select queries, Returning to the Query Design, Multilevel Sorts, Finding incomplete matches, Showing All Records after a Query, Saving Queries, Crosstab Queries.

Printing Reports : Simple table, Form and Database printing, Defining advanced Reports, Manual Reporting, properties in Reports, Saving Reports.

Relational Databases: Flat Versus Relational, Types of Relationships, Viewing Relationships, Defining and Redefining Relationships, Creating and Deleting Relationships.

MS Excel

Excel Basics: Overview of Excel features, Getting started, creating a new worksheet, Selecting cells, Entering and editing text, Entering and editing Numbers, entering and editing Formulas, Referencing cells, moving cells, copying cells, sorting cell data, inserting rows, inserting columns, Inserting cells, Deleting parts of a worksheet, clearing parts of a worksheet.

Formatting: Page setup, changing column widths and Row heights, auto format, changing font sizes and Attributes, centering text across columns, using border buttons and Commands, changing colors and shading, hiding rows and columns.

Introduction to functions: Parts of a functions, Functions Requiring Add-ins, The Function Wizard. Examples functions by category: Data and time

functions, Engineering functions, Math and Trig functions, Statistical functions, Text functions.

Excel Charts: Chart parts and terminology, Instant charts with the chart wizard, creation of different types of charts, printing charts, deleting charts – Linking in Excel

Excel Graphics: Creating and placing graphic objects, Resizing Graphics, Drawing Lines and Shapes.

Unit - 4: C Language fundamentals

Introduction – ‘C’ Fundamentals : Programming – High Level Languages – compiling programs – Integrated Development Environments – Language Interpreters – Compiling your first program – Running your program – understanding your first program – comments – variables, Data types, and Arithmetic Expressions : working with variables – Understanding Data types and constants – working with Arithmetic Expressions – The Assignment operators – The printf function – The scanf function -Decision making : The if statement – the if else construct – Nested if statements – The else if construct – The switch statement – Boolean variables – The conditional operator – program looping : The for statement – Relational operators – Nested for loops – The while statement – The do statement
– The break statement – The continue statement – working with Arrays:
Defining an array –

Initializing Arrays – character Arrays – The const Qualifier – Multidimensional arrays- variable length Arrays.

Working with Functions: Defining a Function-Arguments and Local variables – Returning Function Results – Function calling – Declaring Return Types and Argument types – Top-Down programming
– Functions and Arrays – global variables – Automatic and static variables – Recursive Functions.

Unit - 5: Programming in C

Working with structures: Defining structure – Functions and structures – Initializing structures – Array of structures- structures containing structures – structures containing Arrays – Structure variants – Character strings : Array of characters – variable length character strings – Escape characters –

character strings, structures and arrays - character operations.

Pointers: Defining a pointer variable – using pointers in Expressions – pointers and structures (Exclude Linked List) – Pointers and Functions – pointers and Arrays – operations on pointers – pointers and Memory address.

Operations on Bits: Bit operators – Bit fields

The preprocessor: The # define statement – The # # operator – The #include statement – conditional compilation.

More on Data Types: Enumerated Data Types – The typedef statement – Data Type conversions

Input and Output Operations in “C”: Character I/O – formatted I/O – Input and Output Operations with Files – Special functions for working with Files.

Miscellaneous and Advanced features: The Go to Statement, the null statement, working with unions-the comma operator-type qualifiers.

Computer Science
B.Sc. I Year
Part I: PC Software and 'C' Programming
PRACTICAL PAPER – I: Productivity Tools and 'C' Lab

Course objectives

CO1: Understanding the concept of productivity and its significance in professional and personal life.

CO2: Gaining proficiency in using productivity tools such as time management tools, task management tools, project management tools, and collaboration tools.

CO3: Learning to automate repetitive tasks using tools like macros and scripts.

CO4: Developing an understanding of data analysis and visualization using tools like Excel.

CO5: Enhancing the ability to communicate and collaborate effectively with team members using tools like email, instant messaging, and video conferencing.

MS-WORD

1. Design a visiting card for Managing Director of a Company with following specification.

- i. Size of visiting card is 3.5" x 2."
- ii. Name of a company with big font using Water Mark
- iii. Phone number, fax number and e-mail address with appropriate symbols
- iv. Office and residence address separated by line.

2. Create a letter head of a company.

- i. Name of Company on the top of the page with big font and good style
- ii. Phone numbers, fax numbers, e-mail address with appropriate symbols
- iii. Main products manufactured to be described at the bottom.
- iv. Slogans if any should be specified in bold at the bottom.

3. Creation of your Biodata: consisting of Name, email-id, Contact Address, Carrier Objective, Educational qualifications, social activities, achievements.

MS-POWERPOINT

1. Make a Power point presentation on your strengths, weaknesses, hobbies, factors that waste your time.
2. Make a Power point presentation on any Current affair (Not less than 8 slides)
3. Make a Power point presentation to represent your college profile.
4. Make a Power point presentation of all the details of the books that you had studied in B.Sc. First Year.

MS-ACCESS

1. **Create a database using MS-ACCESS with at least 5 records**

TABLE1 STRUCTURE:

REGISTER NUMBER NAME DOB GENDER CLASS

TABLE2 STRUCTURE:

REGISTER NUMBER M1 M2 M3 M4 M5 TOTAL

Maintain the relationship between two tables with REGISTER NUMBER as a Primary Key and answer the following queries:

Show the list of students with the following fields as one query.

REGISTER NUMBER NAME GENDER TOTAL MARKS

2. **Maintain the relationship between above two tables with REGISTER NUMBER as a Primary Key and answer the following reports:** Reports must have followed columns.

Report1 with REGISTER NUMBER, NAME, MARKS OF ALL SUBJECTS and

TOTAL

Report2 with REGISTER NUMBER, TOTAL, PERCENTAGE.

3. **Create a database using MS-ACCESS with at least 5 records TABLE1**

STRUCTURE:

EMP-CODE EMP-NAME AGE GENDER DOB TABLE2
STRUCTURE:

EMP-CODE BASIC-PAY

Maintain the relationship between two tables with EMP-CODE as a Primary Key generate the following reports:

REPORT1:

EMP-CODE EMP-NAME BASIC-PAY DA HRA GROSS-SALARY

REPORT2:

EMP-CODE EMP-NAME AGE GENDER GROSS-SALARY MS-EXCEL

1. Create an electronic spreadsheet in which you enter the following decimal numbers and convert into Octal, Hexadecimal and Binary numbers Vice versa.

Decimal Numbers: 35,68,95,165,225,355,375,465

Binary Numbers: 101,1101,111011,10001,110011001,111011111.

2. The ABC Company shows the sales of different products for 5 years. Create column chart,3D-column, and Bar chart for the following data.

YEA R	PRO DUC T-1	PRO DUC T-2	PRO DUC T-3	PRO DUC T-4
2003	1000	800	900	1000
2004	800	80	500	900
2005	1200	190	400	800
2006	400	200	300	1000
2007	1800	400	400	1200

3. Create a suitable examination data base and find the sum of the marks(total) of each student and respective class secured by the student rules:

Pass if marks in each subject ≥ 35 Distinction if average ≥ 75

First class if average ≥ 60 but < 75 Second class if average ≥ 50 but < 60 Third class if average ≥ 35 but < 50 Fail if marks in any subject is < 35

Display average marks of the class, subject wise and pass percentage.

C-PROGRAMMING LAB CYCLE

1. Program for
 - i. Sum of factors of a number
 - ii. Sum of digits of a number
2. Program to check whether a given number is.
 - i. Prime number or not
 - ii. Perfect number or not
 - iii. Armstrong number or not
3. Program using recursion for
 - i. Factorial of a given number
 - ii. Fibonacci series
4. Program for roots of a quadratic equation
5. Program using functions.
 - i. With out return value
 - ii. With return value
 - iii. With parameters
 - iv. With out parameters
6. Program to find largest/smallest of n numbers by using arrays.
7. Program for sorting an array.
8. Program for matrix addition & subtraction
9. Program for matrix multiplication
10. Program for transpose of a given matrix.
11. Program for (with and without string functions)
 - i. Comparison of two strings
 - ii. Concatenation of two strings
 - iii. Length of a string
12. Program to process student information. Student structure consists of Sno, Sname, Marks in 6 subjects, Total, average. Calculate total and average of n students and assign grade with following criteria.
Grade A: All pass and avg ≥ 75
Grade B: All pass and avg ≥ 60 and avg < 75 Grade C: All pass and avg ≥ 50 and avg < 60 Grade D: All pass and avg ≥ 40 and avg < 50 Grade E: If fails in one or more subjects.
13. Program for (i) Nesting of Structure (ii) Passing structures to functions.
14. Program to demonstrate (i) Unions (ii) enumerated data types.
15. Program for sum of diagonal elements of a square matrix?
16. Program to access (i) array elements (ii) Structure elements using pointers.
17. Program for sorting strings using pointers.

18. Program to count number of (i) words (ii) lines (iii) Special Characters in each text.
19. Program to create a file to store and retrieve strings using fputs() and fgets().
20. Program to create a file to store and update employee records. The employee record consists of ENO, ENAME, DEPTNO, DEPTNAME, BASICSALARY, HRA, DA, DEDUCTIONS, TOTALSALARY and NETSALARY.
21. Program to evaluate following expressions. $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots + \frac{1}{n}$
22. Program to find square root of a given no.
23. Program to create table of Triangular Numbers.
24. Program for reversing digits of a no.
25. Program for Base Conversion.

Computer Science
B.Sc. II Year
Part II: Object Oriented Programming with Java and Data Structures

Course Objectives

- CO1: Understand basic concepts of Object-Oriented Programming and Java Programming Constructs like constants, variables, operators, and control statements.
- CO2: Understand the concepts of classes, objects, method overloading, inheritance, arrays, strings, and vectors.
- CO3: Understand the need for interfaces and how to achieve multiple inheritance in Java and the concepts of multi-threading by using thread class and implementing. Runnable interface.
- CO4: Understand the concepts of errors and exceptions, keywords that are used to manage Exceptions and various stream classes like byte streams and character stream classes.
- CO5: Understand the concept of applets by how to create and run applets and Graphics programming by various classes in the graphics class.

Unit – 1: Java Fundamentals

Fundamentals of Object Oriented programming: Object Oriented paradigm – Basic concepts of Object Oriented Programming – Benefits of OOP – Applications of OOP.

Java Evolution: Java Features – How Java differs from C and C++ - Java and Internet – Java and World Wide Web – Web Browsers – Hardware and Software Requirements – Java Environment. Overview of Java Language: Simple Java Program – Java Program Structure – Java Tokens- Java Statements – Implementing a Java Program – Java Virtual Machine –

Command Line Arguments.

Constants, Variables and Data types: Constants – Variables – Data types – Declaration of Variables- Giving Values to variables- Scope of Variables- Symbolic Constants-Type Casting.

(Chapters: 1,2,3,4)

Unit – 2: Oops Concepts in Java

Operators and Expressions: Arithmetic Operators – Relational Operators- Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Operator Precedence and Associativity.

Decision Making and Branching: Decision Making with If statement – Simple If Statement-If else Statement-Nesting If Else Statement- the Else If Ladder- The switch Statement – The ?: operator.

Decision Making and Looping: The while statement – The do statement – The for statement – Jumps in Loops.

Class, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance – Overriding Methods – Final Variables and Methods – Final Classes – Abstract Methods and Classes – Visibility Control.

(Chapters: 5,6,7,8)

Unit – 3: Packages and Interfaces in Java

Arrays, Strings and Vectors: One-dimensional Arrays-creating an Array – Two dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types.

Interfaces: Multiple Inheritance: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

Packages: Java API Packages – Using system Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a

Class to a Package – Hiding Classes – Static Import.

(CHAPTERS: 9,10,11)

UNIT – 4: Multithreaded programming and Applets.

Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization.

Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code

– Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Using Exceptions for debugging.

Applet Programming: How Applets differ from Applications – Preparing to write Applets – Building Applet Code – Applet Life Cycle – Creating an executable Applet – Designing a Webpage – Applet Tag – Adding Applet to HTML file – Running the Applet – More about Applet Tag – Passing parameters to Applets – Aligning the display – More about HTML tags – Displaying Numerical Values – Getting Input from the user.

(Chapters: 12, 13, 14)

Unit – 5: Data Structures

Sorting: Bubble Sort – Selection Sort – Insertion Sort – Quick Sort-Stacks and Queues: Stacks – Queues – Circular Queue – Deques - Priority Queue – Parsing Arithmetic Expressions – Linked List: Simple Linked List – Finding and Deleting Specified Links – Double Ended Lists – Abstract Data types – Sorted Lists – Doubly Linked Lists – Advanced Sorting : Quick Sort - Binary Trees : Tree Terminology – Finding a Node – Inserting a Node – Traversing the Tree – Finding Maximum and Minimum values – Deleting a Node – Efficiency of Binary Trees – Trees Represented as Arrays – Graphs: Introduction to Graphs – Searches – Minimum Spanning Tree – Topological Sorting with Directed Graphs – Connectivity in Directed Graphs.

(Chapters: 3,4,5,7 (Only Quick Sort), 8,13)

Computer Science
B.Sc. II Year
Part II: Java and Data structures Lab

Course objectives

- CO1: Understanding the basics of object-oriented programming and programming concepts such as abstraction, encapsulation, inheritance, and polymorphism.
- CO2: Developing proficiency in the Java programming language including data types, control structures, objects, classes, interfaces, and exception handling.
- CO3: Gaining knowledge of various data structures such as arrays, linked lists, stacks, queues, trees, and graphs, and their implementation in Java.
- CO4: Learning to analyze and compare the efficiency of various data structures and algorithms based on time and space complexity.
- CO5: Developing the ability to design and implement efficient algorithms and data structures to solve real-world problems.
- CO6: Learning to use programming tools and techniques like debugging, testing, and profiling to improve code quality.
- CO7: Enhancing problem-solving skills and the ability to apply programming concepts to real-world scenarios.

1. Write a java program to determine the sum of the following harmonic series for a given value of 'n'.
 $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$
2. Write a program to perform the following operations on strings through interactive input.
 - i. Sort given strings in alphabetical order.
 - ii. Check whether one string is sub string of another string or not.
 - iii. Convert the strings to uppercase.
3. Write a program to simulate on-line shopping.
4. Write a program to identify a duplicate value in a vector.
5. Create two threads such that one of the threads print even no's and another prints odd no's upto a given range.
6. Define an exception called "Marks Out of Bound" Exception, that is thrown if the entered marks are greater than 100.
7. Write a JAVA program to shuffle the list elements using all the possible permutations.
8. Create a package called "Arithmetic" that contains methods to deal with all arithmetic operations. Also, write a program to use the package.
9. Write an Applet program to design a simple calculator.
10. Write a program to read a text and count all the occurrences of a given word. Also, display their positions.
11. Write an applet illustrating sequence of events in an applet.
12. Illustrate the method overriding in JAVA.
13. Write a program to fill elements into a list. Also, copy them in reverse order into another list.

14. Write an interactive program to accept name of a person and validate it. If the name contains any numeric value throw an exception “Invalid Name”.
15. Write an applet program to insert the text at the specified position.
16. Prompt for the cost price and selling price of an article and display the profit (or) loss percentage.
17. Create an anonymous array in JAVA.
18. Create a font animation application that changes the colors of text as and when prompted.
19. Write an interactive program to wish the user at different hours of the day.
20. Simulate the library information system i.e. maintain the list of books and borrower’s details.

Data Structures Lab Cycle

21. Program to create, insert, delete, and display operations on single linked list?
22. Program to create, insert, delete and display operations on double linked list ?
23. Program to create, insert, delete and display operations on circular single linked list?
24. Program to split a single linked list.
25. Program to reverse a single linked list.
26. Program to implement Insertion Sort.
27. Program to implement PUSH and POP operations on Stack using array method.

28. Program to implement PUSH and POP operations on Stack using Linked list method.
29. Program to implement insert and delete operations on Queue using array method.
30. Program to implement insert and delete operations on Queue using linked list method.
31. Program to implement insert and delete operations on Priority Queue?
32. Program to implement insert and delete operations on Double Ended Queue?
33. Program to evaluate postfix expression by using Stack?
34. Program to construct Binary Search Tree and implement tree traversing Techniques.
35. Program to delete a leaf node from binary search tree.
36. Program to implement Selection Sort.
37. Program to implement Bubble Sort.
38. Program to implement Operations on Circular Queue.
39. Program to implement Quick Sort.
40. Program to Find number of Leaf nodes and non-Leaf nodes in a Binary Search Tree.
41. Program for Insertion Sort.

Computer Science
B.Sc. III Year
Paper-III : DATABASE MANAGEMENT SYSTEMS

Course Objective:

Database Management Systems after successfully completing this course, students will be able to:

CO1: Will understand the fundamental concepts of database.

CO2: Will understand user requirements and frame it in data model.

CO3: Will understand creations, manipulation and querying of data in databases

CO4: Solve real world problems using appropriate set, function, and relational models.

CO5: Design E-R Model for given requirements and convert the same into database tables.

CO66: Use SQL.

Unit-1: Database Systems Introduction and Fundamentals.

Database Systems: Introducing the database and DBMS, Why the database is important, Historical Roots: Files and File Systems, Problems with File System Data Management, Data base Systems.

Data Models: The importance of Data models, Data Model Basic Building Blocks, Business Rules, The evaluation of Data Models, Degree of Data Abstraction.

The Relational Database Model: A logical view of Data, Keys, Integrity Rules, Relational Set Operators, The Data Dictionary and the systematical, Relationships within the Relational Database, Data Redundancy revisited, Indexes, Codd's relational data base rules.

Unit-2 : Data Modeling and Normalization

Entity Relationship Model: The ER Model, Developing ER Diagram, Database Design Challenges: Conflicting Goals.

Advanced Data Modeling: The Extended Entity Relationship Model, Entity clustering, Entity integrity: Selecting Primary keys, Design Cases: Learning Flexible Database Design.

Normalization of database tables: Database Tables and Normalization, The need for Normalization, The Normalization Process, Improving the design, Surrogate Key

Considerations, High level Normal Forms, Normalization and database design, de normalization.

Unit-3 : Interaction with Databases and Construction of Information System

Introduction to SQL: Data Definition Commands, Data Manipulation Commands, Select queries, Advanced Data Definition Commands, Advanced Select queries, Virtual Tables, Joining Database Tables.

Advanced SQL: Relational Set Operators, SQL Join Operators, Sub queries and correlated queries, SQL Functions, Oracle Sequences, Updatable Views, and Procedural SQL.

Database Design: The Information System, The Systems Development Life Cycle, The Database Life Cycle, Database Design Strategies, Centralized Vs Decentralized design.

Unit-4 : Transaction Management in DBMS Environment.

Transaction Management and Concurrency Control: What is transaction, Concurrency control, Concurrency control with locking methods, Concurrency control with timestamping methods, Concurrency control with optimistic methods, database recovery management.

Distributed Database Management Systems: The evolution of Distributed Database Management Systems, DDBMS advantages and Disadvantages, Distribution Processing and Distribution Databases, Characteristics of Distributed database management systems, DDBMS Components, Levels of Data and Process distribution, Distributed database Transparency Features, Distributed Transparency, Transaction Transparency, Performance Transparency and Query Optimization, Distributed Database Design, Client Server VS DDBMS.

Unit-5 : Data Warehouse Concepts and Database Administration.

The Data Warehouse: The need for data analysis, Decision support systems, the data warehouse, Online analytical processing, Star schemas, Data mining, SQL extension for OLAP.

Database Administration: Data as a corporate asset, The need for and role of databases in an organization, The evolution of the database administration function, The database environment's Human Component, Database administration Tools, The DBA at work: Using Oracle for Database Administration.

Computer Science
B.Sc. III Year
Part III: DBMS Lab

course objectives

- CO1: Understanding the basics of database management systems, data models, and database design.
- CO2: Gaining proficiency in SQL (Structured Query Language), including the ability to create and manipulate tables, views, indexes, and queries.
- CO3: Learning to design and implement a database system using a DBMS (Database Management System) such as MySQL, Oracle, or SQL Server.
- CO4: Understanding the concepts of database normalization and entity-relationship modeling and applying them to create efficient and effective database designs.
- CO5: Gaining knowledge of advanced database concepts such as concurrency control, transaction management, and database security.
- CO6: Learning to use database tools and techniques like backup and recovery, monitoring, and tuning to improve database performance.
- CO7: Developing the ability to work in teams to design and implement a real-world database application.

The Order Tracking Database consists of the following defined six relation schemas.

EMPLOYEES(ENO,ENAME,ZIP,HDATE)
PARTS(PNO,PNAME,QOH,PRICE,LEVEL) (HINT: QOH: QUALITY
ON HAND) CUSTOMERS(CNO,CNAME,STREET,ZIP,PHONE)
ORDERS(ONO,CNO,ENO,RECEIVED DATE,SHIPPED DATE)
ODETAILS(ONO,PNO,QTY)
ZIPCODES (ZIP, CITY)

Solve the following queries

1. GET ALL PAIRS OF CUSTOMER NUMBERS FOR CUSTOMERS BASED ON SAME ZIPCODE.
2. GET PART NUMBERS FOR PARTS THAT HAVE BEEN ORDERED BY AT LEAST TWO DIFFERENT CUSTOMERS.
3. FOR EACH ODETAIL ROW, GET ONO, PNO, PNAME, QTY AND PRICE VALUES ALONG WITH THE TOTAL PRICE FOR THE ITEM. (TOTAL PRICE=PRICE*QTY)
4. GET CUSTOMER NAME AND EMPLOYEE PAIRS SUCH THAT THE CUSTOMER WITHNAME HAS PLACED AN ORDER THROUGH THE EMPLOYEE.

5. GET CUSTOMER NAMES LIVING IN FORT DODGE OR LIBERAL.
6. GET CNAME VALUES OF CUSTOMERS WHO HAVE ORDERED A
PRODUCT WITH PNO 10506.
7. GET PNAME VALUES OF PARTS WITH THE LOWEST PRICE.
8. GET CNAME VALUES OF CUSTOMERS WHO HAVE PLACED AT
LEAST ONE ORDER THROUGH THE EMPLOYEE WITH NUMBER
1000.
9. GET THE CITIES IN WHICH CUSTOMERS OR EMPLOYEES ARE LOCATED.
10. GET THE TOTAL SALES IN DOLLARS ON ALL ORDERS.
11. GET PART NAME VALUES THAT COST MORE THAN THE
AVERAGE COST OF ALL PARTS.
12. GET PART NAMES OF PARTS ORDERED BY AT LEAST TWO
DIFFERENT CUSTOMERS.
13. GET FOR EACH PART GET PNO, PNAME AND TOTAL SALES
14. FOR EACH PART, GET PNO, PNAME, TOTAL SALES, WHOSE TOTAL
SALES EXCEEDS 1000
15. GET PNO, PART NAMES OF PARTS ORDERED BY AT LEAST
TWO DIFFERENT CUSTOMERS.
16. GET CNAME VALUES OF CUSTOMERS WHO HAVE ORDERED
PARTS FROM ANYONE EMPLOYEE BASED IN WICHITA OR
LIBERAL.

SHIPMENT DATABASE

AN ENTERPRISE WISHES TO MAINTAIN THE DETAILS ABOUT HIS SUPPLIERS AND OTHER CORRESPONDING DETAILS. FOR THAT IT USES THE FOLLOWING TABLES

TABLE

S(SID,SNAME,ADDRESS)

PRIMARY KEY :

SID

TABLE

P(PID,PNAME,COLOR)

PRIMARY KEY :

PID

TABLE CAT(SID,PID,COST)

PRIMARY KEY :

SID+PID

**REFERENCE KEY : SID REFERENCES
S.SID**

PID REFERENCES P.PID

Solve the following queries.

1. FIND THE P NAMES OF PARTS FOR WHICH THERE IS SOME SUPPLIER
2. FIND THE S NAMES OF SUPPLIERS WHO SUPPLY EVERY PART.
3. FIND THE S NAMES OF SUPPLIERS WHO SUPPLY EVERY RED PART.
4. FIND THE P NAMES OF PARTS SUPPLIED BY LONDON
SUPPLIER AND BY NOONE ELSE
5. FIND THE SIDS OF SUPPLIERS WHO CHARGE MORE FOR SOME
PART OTHER THAN THE AVERAGE COST OF THAT PART
6. USING GROUP BY WITH HAVING CLAUSE GET THE PART
NUMBERS FOR ALL THE PARTS SUPPLIED BY MORE THAN ONE
SUPPLIER.

7. GET THE NAMES OF THE SUPPLIERS, WHO DO NOT SUPPLY PART P2.
8. FIND THE SIDS OF SUPPLIERS WHO SUPPLY A RED AND A GREEN PART
9. FIND THE SIDS OF SUPPLIERS WHO SUPPLY A RED OR A GREEN PART
10. FIND THE TOTAL AMOUNT HAS TO PAY FOR THAT

SUPPLIER BY PART LOCATED FROM LONDON

Employee Database

An enterprise wishes to maintain a database to automate its operations. Enterprise divided into to certain departments and each department consists of employees. The following two tables describes the automation schemas.

DEPT (DEPTNO, DNAME, LOC)

EMP (EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)

1. CREATE A VIEW, WHICH CONTAIN EMPLOYEE NAMES AND THEIR MANAGER NAMES WORKING IN SALES DEPARTMENT.
2. DETERMINE THE NAMES OF EMPLOYEE, WHO EARN MORE THAN THEIR MANAGERS.
3. DETERMINE THE NAMES OF EMPLOYEES, WHO TAKE HIGHEST SALARY IN THEIR DEPARTMENTS.
4. DETERMINE THE EMPLOYEES, WHO LOCATED AT THE SAME PLACE.
5. DETERMINE THE EMPLOYEES, WHOSE TOTAL SALARY IS LIKE THE MINIMUM SALARY OF ANY DEPARTMENT.
6. UPDATE THE EMPLOYEE SALARY BY 25%, WHOSE EXPERIENCE IS GREATER THAN 10 YEARS.
7. DELETE THE EMPLOYEES, WHO COMPLETED 32 YEARS OF SERVICE.
8. DETERMINE THE MINIMUM SALARY OF AN EMPLOYEE AND HIS

DETAILS, WHO JOIN ON THE SAME DATE.

9. DETERMINE THE COUNT OF EMPLOYEES, WHO ARE TAKING COMMISSION AND NOT TAKING COMMISSION.
10. DETERMINE THE DEPARTMENT DOES NOT CONTAIN ANY EMPLOYEES.
11. FIND OUT THE DETAILS OF TOP 5 EARNER OF COMPANY.
12. DISPLAY THOSE MANAGERS NAME WHOSE SALARY IS MORE THAN AVERAGE SALARY OF HIS EMPLOYEES.
13. DISPLAY THOSE EMPLOYEES WHO JOINED THE COMPANY BEFORE 15TH OF THE MONTH?
14. DISPLAY THE MANAGER WHO IS HAVING MAXIMUM NUMBER OF EMPLOYEES WORKING UNDER HIM?
15. PRINT A LIST OF EMPLOYEES DISPLAYING 'LESS SALARY' IF LESS THAN 1500 IF EXACTLY 1500 DISPLAY AS 'EXACT SALARY' AND IF GREATER THAN 1500 DISPLAY 'MORE SALARY'?
16. DISPLAY THOSE EMPLOYEES WHOSE FIRST 2 CHARACTERS FROM HIRE DATE- LAST 2 CHARACTERS OF SALARY?
17. DISPLAY THOSE EMPLOYEES WHOSE 10% OF SALARY IS EQUAL TO THE YEAR OF JOINING?
18. IN WHICH YEAR DID MOST PEOPLE JOIN THE COMPANY? DISPLAY THE YEAR AND NUMBER OF EMPLOYEES.
19. DISPLAY THE HALF OF THE ENAMES IN UPPER CASE AND REMAINING LOWER CASE
20. DISPLAY ENAME, DNAME EVEN IF THERE NO EMPLOYEES WORKING IN A PARTICULAR DEPARTMENT (USE OUTER JOIN).

University Database

University wishes to computerise their operations by using the following relations.

Student (snum: Integer, sname: string, major: string, level: string, age: integer)

Class (name: String, Hour: Integer, room: string, fid: integer) Enrolled (sum: integer, cname: string)
 Faculty (fid: Integer, fname: String, deptid: Integer) Depart (deptid: Integer, dname: String, loc: integer)

By using above schema definitions, resolve the following queries

1. FIND THE NAMES OF ALL JUNIORS (LEVEL=JR) WHO ARE ENROLLED IN A CLASS TAUGHT BY SMITH.
2. FIND THE AGE OF THE OLDEST STUDENT WHO IS EITHER A HISTORY MAJOR OR IS ENROLLED IN THE COURSE OF SMITH.
3. FIND THE NAMES OF ALL CLASSES THAT EITHER MEET R128 OR HAVE FIVE OR MORE STUDENTS ENROLLED.
4. FIND THE NAMES OF ALL STUDENTS WHO ARE ENROLLED IN TWO CLASSES THAT MEET AT THE SAME HOUR.
5. FIND THE NAMES OF FACULTY MEMBERS WHO TEACH IN EVERY ROOM IN, WHICH SOME CLASS IS TAUGHT.
6. FIND THE NAMES OF FACULTY MEMBERS FOR WHOM THE COMBINED ENROLLMENT OF THE COURSES THAT THEY TEACH IS LESS THAN FIVE.
7. PRINT THE LEVEL AND AVERAGE AGE OF STUDENTS FOR THAT LEVEL, FOR EACH LEVEL.
8. PRINT THE LEVEL AND AVERAGE AGE OF THE STUDENT FOR THAT LEVEL, FOR ALL LEVELS EXCEPT JR.
9. FIND THE NAMES OF STUDENTS WHO ARE ENROLLED IN THE MAXIMUM NUMBER OF CLASSES.
10. FIND THE NAMES OF THE STUDENTS WHO ARE NOT ENROLLED IN ANY CLASS.

Airline Database

An Airline System would like to keep track their information by using the following relations. Flights (flno: integer, from: string, to: string, distance: integer,

Price: integer)
 Aircraft (aid: integer, aname: string, cruising_range: integer) Certified (eid: integer, aid: integer)
 Employees (eid: integer, ename: string, salary: real)

Note that the employees relation describes pilots and other kinds of

employees as well; every pilot is certified for aircraft and only pilots are certified to fly. Resolve the following queries:

1. FOR EACH PILOT WHO IS CERTIFIED FOR MORE THAN THREE AIRCRAFT, FIND THE EID'S AND THE MAXIMUM CRUISING RANGE OF THE AIRCRAFT THAT HE (OR SHE) CERTIFIED FOR.
2. FIND THE NAMES OF PILOTS WHOSE SALARY IS LESS THAN THE PRICE OF THE CHEAPEST ROUTE FROM LOS ANGELES TO HONOLULU.
3. FIND THE NAME OF THE PILOTS CERTIFIED FROM SOME BOEING AIRCRAFT.
4. FOR ALL AIRCRAFT WITH CRUISING RANGE OVER 1,000 MILES, FIND THE NAME OF THE AIRCRAFT AND THE AVERAGE SALARY OF ALL PILOTS CERTIFIED FOR THIS AIRCRAFT.
5. FIND THE AID'S OF ALL AIRCRAFT THAT CAN BE USED FROM LOS ANGELS TO CHICAGO.
6. PRINT THE ENAMES OF PILOTS WHO CAN OPERATE PLANES WITH CRUISING RANGE GREATER THAN 3,000 MILES, BUT ARE NOT CERTIFIED BY BOEING AIRCRAFT.
7. FIND THE TOTAL AMOUNT PAID TO EMPLOYEES AS SALARIES.
8. FIND THE EID'S OF EMPLOYEES WHO ARE CERTIFIED FOR EXACTLY THREE AIRCRAFTS.
9. FIND THE EID'S OF EMPLOYEE WHO MAKE SECOND HIGHEST SALARY.
10. FIND THE AID'S OF ALL THAN CAN BE USED ON NON-STOP FLIGHTS FROM BONNTO CHENNAI.

PL/SQL PROGRAMS

1. WRITE A PL/SQL PROGRAM TO CHECK THE GIVEN NUMBER IS STRONG OR NOT.
2. WRITE A PL/SQL PROGRAM TO CHECK THE GIVEN STRING IS PALINDROME OR NOT.
3. WRITE A PL/SQL PROGRAM TO SWAP TWO NUMBERS WITHOUT USING THIRD VARIABLE.
4. WRITE A PL/SQL PROGRAM TO GENERATE MULTIPLICATION TABLES FOR 2,4,6
5. WRITE A PL/SQL PROGRAM TO DISPLAY SUM OF EVEN NUMBERS AND SUM OF ODD NUMBERS IN THE GIVEN RANGE.
6. WRITE A PL/SQL PROGRAM TO CHECK THE GIVEN NUMBER IS POLLINNDROME OR NOT.
7. THE HRD MANAGER HAS DECIDED TO RAISE THE EMPLOYEE SALARY BY 15%. WRITE A PL/SQL BLOCK TO ACCEPT THE EMPLOYEE NUMBER AND UPDATE THE SALARY OF THAT EMPLOYEE. DISPLAY APPROPRIATE MESSAGE BASED ON THE EXISTENCE OF THE RECORD IN EMP TABLE.

8. WRITE A PL/SQL PROGRAM TO DISPLAY TOP 10 ROWS IN EMP TABLE BASED ON THEIR JOB AND SALARY.
9. WRITE A PL/SQL PROGRAM TO RAISE THE EMPLOYEE SALARY BY 10%, FOR DEPARTMENT NUMBER 30 PEOPLE AND ALSO MAINTAIN THE RAISED DETAILS IN THE RAISE TABLE.
10. WRITE A PROCEDURE TO UPDATE THE SALARY OF EMPLOYEE, WHO ARE NOT GETTING COMMISSION BY 10%

WRITE A PL/SQL PROCEDURE TO PREPARE AN ELECTRICITY
BILL BY USING FOLLOWING TABLE

TABLE USED: ELECT

NAME	NULL?	TYPE
-------------	--------------	-------------

MNO	NOT	NULL
NUMBER(3)CNAME		
		VARCHAR2(
20) CUR_READ		
		NUMBER(5)
PREV_READ		NUMBER(5)
NO_UNITS		NUMBER(5)
AMOUNT		NUMBER(8,2)
SER_TAX		NUMBER(8,2)
NET_AMT		NUMBER(9,2)

WRITE A PL/SQL PROCEDURE TO PREPARE AN TELEPHONE
BILL BY USING FOLLOWING TABLE. AND PRINT THE
MOTHLY BILLS FOR EACH CUSTOMER

TABLE USED : PHONE.

NAME	NULL?	TYPE
-------------	--------------	-------------

TEL_NO	NOT	NULL
		NUMBER(6)
CNAME		
		VARCHAR2(20)
CITY		
		VARCHAR2(10)
PR_READ		
		NUMBER(5)
CUR_READ		NUMBER(5)
NET_UNITS		NUMBER(5)
TOT_AMT		NUMBER(8,2)

WRITE A PL/SQL PROGRAM TO RAISE THE EMPLOYEE
SALARY BY 10%, WHO ARE COMPLETED THERE 25 YEARS
OF SERVICE.

WRITE A PL/SQL PROCEDURE TO EVALUATE THE GRADE OF A STUDENT WITH FOLLOWING CONDITIONS:

- i. FOR PASS: ALL MARKS > 40
 - ii. FOR I CLASS: TOTAL% > 59
 - iii. FOR II CLASS: TOTAL% BETWEEN >40 AND <60
 - iv. FOR III CLASS: TOTAL% = 40
- AND ALSO MAINTAIN THE DETAILS IN ABSTRACT TABLE.

TABLES USED TABLE STD

SQL> DESC STD

NAME	NULL?	TYPE
NO	NOT	NULL
NUMBER NAME		
		VARCHAR2(
10)		
INTNO		NUMBER
CLASS	NOT	NULL
VARCHAR2(10)M1		NUMBER
M2		NUMBER
M3		NUMBER
M4		NUMBER
M5		NUMBER

TABLE ABSTRACT

SQL> DESC ABSTRACT

NAME	NULL?	TYPE
-----	-----	
----		STDNO
		N
NUMBER		

STDNAME	VARCHA
R2(10)	CLASS
R2(10)	VARCHA
INTNO	NUMBER
TOT	NUMBER
GRADE	VARCHAR2(10)
PERCENT	NUMBER
DAT_ENTER	DATE

WRITE A PROCEDURE TO UPDATE THE SALARY OF EMPLOYEE,
WHO BELONGS TO CERTAIN DEPARTMENT WITH A CERTAIN
PERCENTAGE OF RAISE.

Computer Science

B.Sc. III Year

Paper-III: OPERATING SYSTEMS

Course Objective:

CO1: To understand the services provided by and the design of an operating system.

CO2: To understand what a process is and how processes are synchronized and scheduled.

CO3: To understand different approaches to memory management.

CO4: Students should be able to use system calls for managing processes, memory, and the file system.

CO5: Students should understand the data structures and algorithms used to implement an OS.

Unit–1: OS Fundamentals and Structure of OS.

Introduction – What Operating Systems do – Computer – system organization – Computer System Architecture – Operating Systems structure – Operating System operations Process management -Memory management,

Storage management, Protection, and security– Distributed systems–Computing environments.

System structures – Operating System services – User Operating System interface – system calls –Typesofsystemcalls–systemprograms–Operatingssystemstructure–systemBoot.Processconcept – Process scheduling – Operations on processes – Inter process communication – Examples of IP systems–Communication in Client server systems.

Unit–2: Multithreading and Process Synchronization.

Multi-threaded programming–Multithreading models – Thread Libraries– Threading

issues–Operating System examples. Process Scheduling – Basic concepts – Scheduling Criteria–Scheduling Algorithms–Multiple process scheduling – Thread scheduling – Operating System examples. Process Synchronization – The Critical section problem – Peter’s solution – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Monitors – Synchronization examples. Deadlocks – System model – Deadlock Characterization –Methods for Handling Deadlocks – Deadlock prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock.

Unit-3: Memory Management Strategies.

Memory–management strategies – swapping–contiguous Memory allocation – paging – structure of the page table – Segmentation. Virtual – Memory management – Demand paging – Page Replacement. File system –File concept – Access Methods–Directory structure–Protection.

Unit-4: File Systems and I/O Management.

Implementing file systems–File system structure File system implementation–Directory implementation – Allocation methods – Free space management – Efficiency and Performance –Recovery. Secondary storage structure – overview of Mass-storage structure-Disk structure - Disk Attachment – Disk Scheduling – Disk Management – Swap space Management – RAID structure. I/O systems – overview – I/O hardware – Application I/O interface – Kernal I/O subsystem –Transforming I/O requests to Hardware Operations.

Unit-5: Real Time Systems and Case Study.

Real Time systems – Overview – System characteristics – Features of Real time Kernels – Implementing Realtime Operating Systems–Realtime CPU Scheduling – Vxworks5.x Case study: The Linux System: Linux history – Design principles – Kernel Modules – Process Management –Scheduling–Memory Management–File systems–Input and Output–Inter process communication – Network structure.

Computer Science

B.Sc. III Year

Paper-III: OPERATING SYSTEMS LAB

Course Objectives

- CO1: To learn shell scripting concepts, including variable declaration, arithmetic operations, and conditional execution.
- CO2: To understand how to use conditional execution operators in shell scripts.
- CO3: To learn how to perform file tests using shell scripts.
- CO4: To understand how to retrieve and display information about recent user logins to the Unix system.
- CO5: To learn how to use shell scripts to perform directory operations, such as finding the number of files in a directory.
- CO6: To understand how to use loops in shell scripts to print specific output formats.
- CO7: To learn how to calculate the number of days in a given month and year using shell scripts.
- CO8: To understand how to check whether a given number is a perfect number or not using shell scripts.
- CO9: To learn how to concatenate strings using arguments in shell scripts.
- CO10: To understand how to use break and continue statements in shell

scripts.

CO11: To learn how to create a menu-driven shell script.

CO12: To understand how to delete files of zero bytes using shell scripts.

CO13: To learn how to display reverse numbers from given argument lists
Using shell scripts.

CO14: To understand how to display factorial values using shell scripts.

CO15: To learn how to greet the user according to the current time using shell scripts.

CO16: To understand the concepts of different process scheduling algorithms and implement them in shell scripts.

CO17: To learn how to implement different memory allocation algorithms and file organization techniques using shell scripts.

1. Write a shell script to accept two numbers and perform all arithmetic operations on it.
2. Write a shell script to find largest of three numbers using conditional execution operators.
3. Write a shell script to accept the name of the file from standard input and perform the following tests on it
 - a) File executable
 - b) File readable
 - c) File writable
 - d) Both readable & writable
4. Write a shell script which will display the username and terminal

name who login recently into the Unix system.

5. Write a shell script to find number of

files

in a directory

6. Write a shell script to print the

following

format

1

12

123

1234

.....

1. Write a shell script which will display the number of days in the given month and year.

2. Write a shell script to check whether a given number is perfect number or not.

3. Write a shell script for concatenation of two strings using arguments.

4. Write a shell script to demonstrate break and continue statements.

5. Write a shell script to satisfy the following menu options.

a. Display current directory path.

b. Display today's date.

c. Display users who are connected to the Unix system.

d. Quit

6. Write a shell script to delete all files whose size is zero bytes from current directory.

7. Write a shell script to display reverse numbers from given argument list.

8. Write a shell script to display factorial value from given argument list.

9. Write a shell script which will greet you "Good Morning", "Good Afternoon", "Good Evening" and "Good Night" according to current time.

10. To implement the FCFS Algorithm
11. To implement the Shortest Job First Algorithm
12. To implement Priority Algorithm
13. To implement the round robin Algorithm
14. To implement the FIFO page replacement Algorithm
15. To implement LRU page replacement Algorithm
16. To implement Resource Request Algorithm
17. To implement First-Fit, Best-Fit, Worst-Fit Algorithm
18. To implement Sequential File Organization
19. To implement Random File Organization