SEMESTER IV
BCA-401: COORDINATE GEOMETRY OF THREE DIMENSIONS

Max.Marks:50 **Min.Marks:17**

OBJECTIVE: To Introduce the concept of coordinate geometry of three dimensions.

EXAMINATION
The internal examination will carry 20% marks i.e. 10 marks. The external examination will be of 80% marks i.e. 40 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical objective/conceptual/analytical/theoretical) combination of subsection in each question.

UNIT I
Rectangular Cartesian of a point in space. Distance between two points. Cylindrical coordinates, Spherical Coordinates, direction cosines, point of division, orthogonal projections, angle between straight. Examples and exercise. Shortest distance between the straight line, line of greatest slope, Conditions for line intersection. Orthogonal projection of a plane area. Area of triangle in space, volume of triangle in space. Examples and Exercise.

UNIT II
Sphere circle and related topics, Tangent lines and tangent planes to a sphere, radial plane, radial line, coaxial spheres, limiting points. Examples and exercises. Surface and conicoid: transformation of axes, Invariant and decrementing Cube, centre, tangent planes, normal lines, principle directions, Diametrical and principle planes. Examples and exercises.

UNIT III
Conicoid polar planes, Locus of chords, Pole with respect to conicoid. Examples and Exercises. Parabolic, definition and description, Elliptical and Hyperbolic parabolic, Parabolic of revolution, Tangent planes and normal to a parabolic, Diametrical and Conjugate planes, Examples and exercises.

UNIT IV
The Ellipsoid, normal plane to it, director sphere of an ellipsoid, normal line to ellipsoid, diametrical plane to ellipsoid, conjugate diameters and diametrical planes to ellipsoid, locus of chords, polar planes. Examples and Exercises.

UNIT V
The definition and description, finding equation of cone, standard equation, condition of general Quadratic equation representing cone, Angle between two generators, enveloping cone of coincoids, right circular cone. Examples and exercises. The Cylinder definition, equation, right circular cylinder, enveloping cylinder to a coincoid. Examples and exercises.

TEXT BOOK

Coordinate Geometry of three Dimensions by G. Paria, Scholar Publishing House, Indore

REFERENCE BOOKS

1. Differential Equations, Fourier Series and Analytical Solid Geometry : P.R. Vittal (Margham Publishers)
2. Engineering Mathematics Volume 3: M. K. Venkataraman (National Publishing Co.)
3. Engineering Mathematics Volume 3: R Kandasamy and others (S. Chand and Co.)
4. Advanced Engineering Mathematics : Stanley Grossman and William R. Devit (Harper and Row publisher)
5. Fundamentals of mathematical statistics: S. C. Gupta and V. K. Kapoor (Sultan Chand and sons)

BCA-402-DATABASE MANAGEMENT SYSTEM

Max.Marks:50 **Min.Marks:17**

OBJECTIVE: To introduce the concept of database management system

EXAMINATION
The examination will be of 50 marks. The question will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (numerical/objectives/conceptual/analytical/theoretical) combination of subsection in each question.

UNIT-I
Introduction: purpose of DBMS, view of data, data models: physical model, logical model, conceptual model, hierarchical model, network model. Object oriented model. database language, Database administrator, database user, overall system structure.

UNIT-II
Entity relationship model: basic concepts, mapping constraints, keys, E-R diagram, weak, entity features, design of an E-R database schema, reduction of E-R schema to table.

UNIT-III
Structured Query Language(SQL):basic structure, set operations, aggregate functions, null values, nested sub queries, data definition language(DDL), data manipulation language(DML), data control language(DCL), transaction control language(TCL),QBE,QUEL.

UNIT-IV
Relational database design: pitfalls in relational database design, decomposition, normalization using functional dependencies, normalization using multivalue dependencies, normalization using joined dependencies.
Integrity constraints: domain constraints, entity integrity constraints, referential integrity constraints, assertion, triggers, functions, procedures, cursors.

UNIT-V
Concept of RDBMS, characteristics of RDBMS, Codd's 12 rules, introduction to oracle tools, security.

TEXT BOOK
Database system concepts by A.silberschatz, H.F.Korth, and S.Sudershan 5th Edition McGraw Hill

REFERENCE BOOKS
1. An introduction to database management system by Vipin Desai
2. Modern database system by Mcfadden

BCA-403-DATA AND NETWORK COMMUNICATION

Max.Marks:50 **Min.Marks:17**

OBJECTIVE: To introduce the concept of data and network communication

EXAMINATION
The internal examination will carry 20% marks i.e. 10 marks. The external examination will be of 80% marks i.e. 40 marks. The question will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (numerical/objectives/conceptual/analytical/theoretical) combination of subsection in each question.

UNIT-I
Data communication system, data communication links, character codes, digital data rates, serial data formats, encoded data formats, telephones systems, error detection & correction.

UNIT-II
Model, data topologies, data switching, type of networks, networking medium twisted pairs, coaxial cable, optical fibers, system network architecture, SNA operating system. Introduction to OSI & TCP/IP.

UNIT-III
Limits of communication, RS449 interface standards, RS422 & RS423, F5K & V0 modems, multiplexing methods, sampling theorem and quantization, delta modulation, digital T carrier, CODEC.

UNIT-IV
Data link protocol, character oriented protocol & bit oriented protocol, network architecture protocols, Ethernet & token ring

UNIT-V
Integrated services & routing protocols, B-ISDN, DSL& ATM, and Internet

TEXT BOOK:

Computer Network by Andrew S. Tannenbaum PHI, Fourth Edition

REFERENCE BOOKS:

1. Data & Network Communication by Michael A. Miller
2. Understanding of Data Communication & Networks by William A. Shay

BCA-404-DIGITAL COMPUTER ORGANIZATION

Max.Marks:50 **Min.Marks:17**
50

OBJECTIVE: To introduce the concept of digital Computer Organization.

EXAMINATION
The examination will be of 50 marks. The question will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (numerical/objectives/conceptual/analytical/theoretical) combination of subsection in each question.

UNIT I

Block diagram of Computer, Stored program Concept, Word length and processing speed of the Computer, User interface, Hardware/Software Concepts, Microprocessor and Single chip microprocessor concepts.

UNIT II

Input and Output Units, Floppy disk, hard disk, keyboard, mouse, joystick, scanner, serial printer, letter quality printers, plotters, laser printers, and graphics display devices.

UNIT III

Computer Memory: memory cell, memory organization, Read Only Memory, Random Access Memory, PROM,EPROM,EEPROM, serial access memory, magnetic hard disk and floppy disk driver, magnetic tape drive, Cash memory, memory controller, optical disk, program and data memory, memory management and problem is chapter 6 of reference.

UNIT IV

Distributed processing or multi processing, batch processing , multi programming and multi user system, dumb and smart terminals computer network, Local Area network, Parallel processing, Central processing Unit

UNIT V

Memory Management, U-Bits for virtual addressing scheme, I/O architecture: properties of simple I/O and their controllers. Transfer of information between I/O devices, CPU and Memory, Program control and Interrupted control information transfer, I/O processor, Interrupt controllers, H/W and S/W interrupts, Traps and exceptions, DMA transfer, DMA Controller, Cycle stealing, Block transfer and worst mode of data transfer.

TEXT BOOK

Digital Computer Organisation – Morris Mano – Pearson

REFERENCE BOOKS:

1. Computer fundamental architecture and Organization by B. Ram
2. Computer Architecture and Organisation, Nicholas carter, Scaum Series TMH Adaptation, 2nd Ed. 2010
3. Computer organization by Hayes.
4. Alex Leon & Mathews Leon, "Fundamentals of Information Technology", Leon Techworld, 1999.
5. Vikas Gupta, "Comdex Computer Kit", Wiley Dreamtech, Delhi, 2004
6. P. K. Sinha & Priti Sinha , "Computer Fundamentals", BPB Publications, 1992.
7. V. Raja Raman, "Introduction to Computers", PHI, 1998.
8. Alex Leon & Mathews Leon, "Introduction to Computers", Vikas Publishing House, 1999.
9. Norton Peter, "Introduction to computers", 4th Ed., TMH, 2001.

BCA-405-UNIX OPERATING SYSTEM

OBJECTIVE: To introduce the concept of Unix Operating System.

EXAMINATION
The examination will be of 50 marks. The question will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (numerical/objectives/conceptual/analytical/theoretical) combination of subsection in each question.

UNIT I

Unix operating system, background, philosophy, help facility, The file system, structure of file system, pwd, cd, ls, mkdir, chmode, cp, mv, rm commands.

UNIT II

Utilities: more, file, wc, cmp, comm, diff, lp, banner, cal, date, who, tty, stty commands. The Bourne shell: sh preceding a command by its own combining commands, pattern matching, echo, pipes, tees, shell variables and shell scripts.

UNIT III

Simple filters: pr, head, tell, cut, paste, sort, uniq, nl commands. Advanced filters: grep, egrep, fgrep, sed, tr, join, awk, filtering. The process: shell process, parent and children process status, system processes, multiple jobs and background, wait commands, pre mature termination of process, job execution with low priority, multiple jobs in foreground, shell layers, timing processes.

UNIT IV

Communication and scheduling: bulletin board, message of day, two way communication, insulation from the other users, address all users, delay, execute at later running jobs, periodically.
Programming with shell: system variable, profile, conditional execution, script termination, if, case, while, until, for, set and shift statement.

UNIT V

System Administration: super user, security, user services, floppy disk, management operation, files system, administration backups.

TEXT BOOK
Sumitabha Das, "Unix : Concepts and Applications", Third Edition, 2006,Tata McGrawHill

REFERENCE BOOK:

1. Maurice J. Bach, "Design of the Unix Operating System", Third Edition,2000,PHI.
2. ISRD Group, Basics of OS, UNIX and SHELL Programming" TMH (2006)
3. A User guide to unix system",Thomas Rebecca yate,Second Edition,2002,.Tata McGraw Hill.
4. Stephen Prata "Advanced Unix -A programmer's Guide".

BCA-406: ENVIRONMENT AWARENESS.

Max. Marks :25 **Min. Marks : 09**

OBJECTIVE: To introduce the concept of environment awareness

EXAMINATION

The internal examination will carry 20% marks i.e. 10 marks. The external examination will be of 80% marks i.e. 40 marks. The question will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (numerical/objectives/conceptual/analytical/theoretical) combination of subsection in each question

Unit-I

Environment meaning, structure & type of environment, components of environment and society environment and resources. Man environment relationship, approach to study, man interaction with environment (historical to present day).

Unit-II

Environment Degradation: Meaning pf degradation, types of degradation, process of degradation, cause of degradation, religious & philosophical factors of deforestation agricultural development & degradation population growth & degradation, urbanization & degradation, modern technology & degradation.

Unit-III

Ecology: Definition of ecology & ecosystem. Types of ecosystem, components of ecosystem, functions of ecosystem, productivity & stability of ecosystems
Environmental disasters: meaning & concepts, types of hazard & disaster, man induced & natural hazards, global warming, ozone depletion, green house effect & other major environmental problem, biodiversity.

Unit-IV

Environmental Pollution: Air, water, solid, noise pollution Meaning, definition, source, types, adverse effects & methods of control

Unit-V

Environmental Planning & Management: Concepts, aspects and Approaches, resources management, ecological Mgt. Biosphere Reserves, Management of wild life. Environmental Regulation and Rules: Vision of environment by Govt. of India, Environmental Policy, waste disposal rules and laws and legislation enacted by Parliament for environmental protection.

TEXT BOOK

"Environmental Awareness" Dhananjay Verma, Madhya Pradesh Hindi Granth ACADEMY

REFERENCE BOOKS:

1: Environmental Geography by Savinder Singh.
2: Environmental Concept/Issue by Rupa And Co.
3: Environment Rules and Regulation.
4: Environment Mgt. Vikas Publication by G.N. Pandey.

BCA-407: PRACTICAL EXERCISE
(Database Management System)

Max. Marks :25 **Min. Marks : 09**

1. E-R diagram based on queries.
2. Structured Query Language(SQL):DDL, DML, DCL and TCL commands,
3. Queries based on SQL including set operations & aggregate functions.
4. Queries based on SQL including other operators like in operators, between operators, like operators, check operators.
5. Retrieve data from the table using SQL statement.
6. Queries based on Quel & QBE(Query by example)

BCA-408: PRACTICAL EXERCISE
(Digital Computer Organization)

Max. Marks :25 **Min. Marks : 09**

1. Conversion from decimal to binary.
2. Conversion from decimal to octal.
3. Conversion from decimal to hexadecimal.
4. Convert encoder to decoder.
5. Convert decoder to encoder.
6. Addition of two 8 bit numbers.
7. Subtraction of two 8 bit numbers.
8. Multiplication of two 8 bit numbers.
9. Division of two 8 bit numbers.
10. Exchange of two 8 bit numbers.

BCA-409: PRACTICAL EXERCISE
(Unix Operating System)

Max. Marks :25 **Min. Marks : 09**

1:- Demonstrate the following commands:

i) ls
ii) cat
iii) mkdir
iv) cp
v) pwd
vi) chmod with its options, cal,date,who,tty, lp,stty.

2:- Basic Operations

i. Connecting to the system
ii. Disconnecting from the system
iii. Text and graphic mode
iv. Changing your password
v. Navigating through the file system
vi. Determining file type
vii. Looking at text files
viii. Finding help
ix. List the different types of file comparisons command.

3:- Demonstrate the all types of disk related commands.

4:- Demonstrate following commands:-

i) md
ii) rm
iii) file
iv) less

5:- Demonstrate the following commands

i) head
ii) tail
iii) wc
iv) paste
v) sort

6:- Demonstrate the following commands

i) unique
ii) grep
iii) fgrep
iv) tee

7:-.List the different types of Mathematical command in UNIX.

8:- Demonstrate the mail command with an example.

9:- Write the program to compare the two strings.

10:- Write the program to move one file to another file.

11:- Write the program to print the following diagram:-

i)
```
1
2 3
4 5 6
7 8 9 10
```

ii)
```
* * * *
* * *
* *
*
```

12.Shell programming of bourne shell.

13.Shell programming of bourne shell including if, for, while, case and shift statement.

14. Shell programming of C shell.