BCA – 401: Coordinate Geometry of Three Dimensions

Level of Knowledge: Expert Knowledge
Course Objective: The objective of this course is to familiarize the students with concept and applications Coordinate Geometry of Three Dimensions
Scheme of Examination
Total marks 100.
Internal marks 40.
External marks 60.
The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.

Course Contents

Unit 1

Basic concepts of 3d geometry: Rectangular Cartesian Coordinates of a point, Cylindrical and Spherical Coordinate Systems and their inter conversion, Distance between two points, Point of internal and external division, Direction cosines and direction ratios, Orthogonal Projection, Angle between two straight lines with given direction cosines and ratios, Examples and Exercises.

Unit 2

The plane: Plane and its equations in various forms, condition for a common line of intersection of three planes, perpendicular distance between a point and a plane, Bisector Planes, Angle between Pair of Planes.

The straight line: straight Line in Symmetrical form, Line of Greatest Slope, perpendicular distance between a point and a straight line. Condition for two intersecting straight lines. Coplanner straight lines. Shortest distance between two straight lines, Orthogonal Projection of a plane Area, Area of Triangle in space, volume of tetrahedron in space.

Unit 3

Sphere: Definition, General Equation. Equation of Sphere through three given points, through extremities of diameter, section of a sphere, intersection of two spheres, Sphere through a given circle, Tangent Plane, Polar Plane, Orthogonal Spheres, Length of Tangent, Radical Plane, Axis and Center, Coaxial System of Spheres and Limiting Points.

Unit 4

Cone: Definition, Finding Equation of Cone, Standard equation, Condition of general quadratic equation representing Cone, Angle between two generators of Cone, Right Circular Cone, Enveloping cone of Conicoids and Reciprocal Cone Examples and Exercises.

Cylender: Definition, Finding Equation of Cylinder, Right Circular Cylinder Enveloping Cylinder of Conicoids
Examples and Exercises.

Unit 5

Conicoids: Definition, General equation of a conicoid, condition of tangency, director sphere, Polar Plane and Pole, locus of chords with a given mid point, Normal and related topics, Diametral Plane, Properties of conjugate semi diameters.

Paraboloid: General equation, Condition of tangency and conjugate Diametral Planes.

Text Readings:

1. Paria G.: **Coordinate Geometry of Three Dimensions**, Scholar Pub. House, Indore.
2. Chartergee P.N. : **Three Dimensional Geometry**, Rajhans Pub. Meerut.
3. Agrawal D.C. and Tiwari Jayesh K. : Coordinate Geometry of Three Dimensions, Shree sai Prakashan, Meerut, 2nd Edition(2009)

BCA-402: DATABASE MANAGEMENT SYSTEM

Level of Knowledge: Expert Knowledge
Course Objective: To Introduce the concept of Database Management System
Scheme of Examination
Total marks 100.
Internal marks 20.
Practical Marks 20
External Marks 60
The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.
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Course Contents

Unit 1

Introduction: Purpose of DBMS, view of data, data models : physical model, logical model, conceptual model, hierarchical model, network model, Object oriented model. Database Languages, database administrator, database users, overall system structure.

Unit 2:

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 3:

Structured Query Language (SQL) : Basic structure, set operations, aggregate functions, null values, nested subqueries, data definition language(DDL), data manipulation language(DML), Data control Language(DCL), Transaction Control language(TCL), QBE, QUEL.

Unit 4:

Relational Database Design: Pittfalls in Relational Database Design, decomposition, Normalization using functional dependencies, normalization using multivalued dependencies, normalization using joint dependencies. Integrity constraints: Domain constraints, Entity Integrity constraints, referential integrity constraints, assertion, triggers.

Unit 5:

Concepts of RDBMS, characteristics of RDBMS, Codd's 12 rules, Introduction to oracle tools, security.

Text Readings:

1. Silberschatz A., Korth H.F.., Sudershan S.:**Database System Concept,** Tata Mcgraw Hill
2. Desai Vipin:**An Introduction To Database Management System** West Group 11th Edition
3. McFadden: **Modern Data Base System,** Pearson Education 5th Edition

List of Suggested Practicals

1. E-R diagram based on queries.
2. Queries based on SQL including set operation and aggregate function.
3. Queries based on SQL including other operators like in operator, between operators like operators, check operators.
4. Retrieve data from the table using SQL statement.
5. Queries based on Quel and QBE(Query by example).

BCA-403: Data and Network Communication

Level of Knowledge: Expert Knowledge

Course Objective To Introduce the concept of Data and Network Communication
Scheme of Examination
Total marks 100.
Internal marks 40.
External marks 60.
The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.

Course Contents

Unit 1:

Data Communication System, data Communication Links, Character Code, Digital Data rates, Serial Data Formats, encoded data Format, telephones System, Error Detection and Correction.

Unit 2:

Model Data Topologies, Data Switching, Types of Networks, Networking Medium Twisted Pairs, coaxial cables, optical fibers, System Network Architecture, SNA Operating System,

Unit 3:

Limits of Communication, RS 449 Interface Standards, RS 422 and RS 423 F5k and V0 Modem, Multiplexing Methods, Sampling Theorem and Quantization, Delta Modulation, Digital T carrier, CODEC.

Unit 4:

Data Link Protocol, Character Oriented Protocols and bit oriented protocols, Network Architecture protocol, Ethernet and token ring,

Unit 5:

Integrated Services and Routing Protocols, B-ISDN, DSL and ATM, Internet and TCP/IP.

Text Readings:

1. Miller Michal A: **Data and Network Communication** , Jaico Publishing House
2. Tannenbaum Andrew S.: **Computer Network** , Prentice Hall; 4 edition
3. William A. Shay, Wadsworth: **Understanding of Data Communications and Networks** By Publishing Company; 2 edition

BCA-404: Digital Computer Organization

Level of Knowledge: Expert Knowledge
Course Objective To Introduce the concept of Digital Computer Organization.
Scheme of Examination
Total marks 100.
Internal marks 40.
External marks 60.
The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.

Course Contents

Unit 1 :

Block of diagram of computer, stored program concepts, working of computer, word length and processing speed of computer, user interface. Hardware- Software concepts, microprocessor and single chip microcomputer concepts.

Unit 2:

Input and Output units, floppy disk, hard disk, keyboard, mouse, joy sticks, scanners, serial printer, letter quality printers, plotters, laser printer, graphics display device.

Unit 3:

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, cache memory, memory controller, optical disk, program and data memory. Memory management

Unit 4:

Distributed processing or multiprocessing, Batch processing, multiprogramming and multiuser system. Dumb and Smart terminals, computer network, local area network, parallel processing, central processing unit

Unit 5:

Memory management Units for Virtual addressing schemes.I/O architecture: properties of simple I/O devices and their controller(s), transfer of information between I/O device, CPU and Memory, program control and interrupt control information transfer, I/O processor, Interrupt controllers, hardware and software interrupts, traps and exceptions.

DMA transfer, DMA controllers, cycle stealing, blocks transfer and burst mode of data transfer.

Text Readings:

1. B. Ram: **Computer Fundamentals Architecture and Organization**, New Age
2. Hayes: **Computer Organization**, Tata McGraw-Hill

BCA-405: UNIX Operating System

Level of Knowledge: Expert Knowledge

Course Objective: To Introduce the concept of Unix Operating System

Scheme of Examination

Total marks 100.
Internal marks 20.
Practical Marks 20
External Marks 60

The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.

Course Contents

Unit 1

Unix Operating System: Back ground, Philosophy, Help Facility,

The File System: Structure of file System, pwd, cd, ls, mkdir, chmod, cp, mv, rm commands

Unit 2

Utilities: More, File, we, 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, Shell Script.

Unit 3

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 Process, Multiple Jobs in background, wait commands, premature termination of process, Job execution with low priority, Multiple jobs in foreground, Shell layers, timing process.

Unit 4

Communication and scheduling : Bulletin board, Message of the day, two way communication, Insulation from the other users, mailbox, Address all users, Delay, execute at later running jobs periodically.
Programming with shell, System variables, profile, conditional execution, script termination, if, case, while until, for, set and shift statements,

Unit 5

System Administrations: super user, Security, user services, floppy disk, Management Operation, file system, Administration back ups.

Text Readings:

1. Das smitabha: **Unix Operating System,** Tata McGraw-Hill 2nd edition (2005)
2. Deitel : **An introduction to operating system**, Addison-Wesley

List of Suggested Practicals

1 Shell programming of Bournce shell.
2 Shell programming of Bournce shell including if, for, while, case and shift statement
3 Shell programming of C shell.

BCA-406: Environmental Awareness

Level of Knowledge: Expert Knowledge
Course Objective To Introduce the concept of Environmental Awareness
Scheme of Examination
Total marks 100.
Internal marks 40.
External marks 60.
The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.

Course Contents

Unit 1

Environment: Meaning, Structure and type of environment, Components of environment and society environment and resources. Man environmental relationship, Approach to study, Man interaction with environment (Historical to present day)

Unit 2

Environment Degradation: Meaning of degradation, types of degradation, process of degradation, cause of degradation, religious and philosophical factors, deforestation, agricultural development and degradation population growth and degradation, Modern technology and degradation.

Unit 3

Ecology : Definition of Ecology and ecosystem, types of ecosystem , Components of ecosystem, functions of ecosystem, productivity and stability of ecosystems.
Environment Disasters: Meaning and concepts, types of hazards and disasters, man induced and natural hazards, global warming, ozone depetion, green house effect and other major environmental problems.

Unit 4

Environmental Pollution: air, water, solid, noise pollution, meaning definition, sources, types, adhere effects and methods of control.

Unit 5

Environmental planning and Management: Concepts, aspects and approaches, resource Management, ecological Management, biosphere reserves, Management of wild life.
Environmental regulation and rules: vision of environment by government of India, environmental policies, waste disposal rules and laws and legislation enacted by parliament for environmental protection.

Text Readings:

1.Singh Savinder: Environmental Geography, Prayag Pustak Bhavan (1995)
2. Rupa and co. : Environmental Concepts/ Issues
3. Environmental Rules and Regulations
4. Pandey GN : Environment Management, Vikas publication