

PAPER-III
COMPUTER ORGANIZATION AND ARCHITECTURE

Unit-I

Top Level Organization:

Computer function, Difference between program compilation and Program Execution, Programs and Data, Data Representation, Computer Organization: Registers and Memory, Computer Arithmetic: Integer and Floating point arithmetic, Instructions, Machine instructions, Types of operands, Instruction Types, Instruction format, Instruction Execution, A Simple Machine instruction cycle, Instructions Mnemonics and Syntax, Instruction set, Addressing Mode, Type of Addressing Mode.

Unit-II

Internal Organization and Design:

Instruction Set Architecture, Architecture Space, Architecture Examples, Binary Arithmetic, ALU Design, Overflow, Floating Point Arithmetic, Processor Design: Introduction, Simple Design, Multi Cycle Approach, Processor Design Micro programmed Control, Processor Design Exception Handling, Processor Activities, Controller Design: Micro programmed and Hardwired, Typical Micro Instructions, Micro-Operations, Hardwired Implementation, Micro programmed Control: Microinstruction Sequencing, Microinstruction execution, Application of Microprogramming.

Unit-III

Classification and Uni-processor Architecture:

Classification of Computer, Flynn's Classification, Classification of computer on the basis of speed, size, capacity, generation etc., Types of Parallel Computer, Pipeline technique, Different Types of Pipelining, Instruction Pipeline, RISC & CISC Pipeline, Pipeline hazards, Vector Processing, Array Processor.

Unit-IV

Memory Organization:

Memory Hierarchy: Basic Idea, Main Memory: RAM & ROM chip, Auxillary Memory, Advanced DRAM Organization, Cache Memory: Cache Memory Principles, Elements of Cache Design, Cache operation, Cache Organization, Pentium 4 and PowerPC Cache Organization, Type of Cache Coherence, Virtual Memory: Basic Idea, Theory, Implementation of Virtual Memory.

Unit-V

I/O Organization and Multi-Processor Architecture

External Devices, I/O Modules, Input / Output Subsystem: Introduction, Interfaces and buses, I/O Operations, Designing I/O Systems, Programmed I/O , Interrupt Driven I/O , OMA : Direct Memory Access, Device Service Routines, Input-Output Processor, Tightly Coupled MIMD Architecture: Shared Memory and Message Passing Architecture with examples.

Text Books: 1. Computer System Architecture, M. Morris Mano, PHI Pearson Edu.

2. Computer Organization, C Hamacher, Z Vranesic, SafwatZaky, McGraw Hill.

3. Computer Architecture and Organization, J. P. Hayes, Tata McGraw-Hill.

Reference Books: 1. Structured Computer Organization, A. S. Tanenbaum, Pearson Edu.

2. Fundamentals of Computer Organization, P. Dandamudi , Springer.

3. Computer Organization and Architecture, William Stallings, Pearson/PHI.

4. Computer Organization and Design ,D.A.Paterson & John L. Hennessy, Elsevier.

5. Computer Architecture and Organization, M. Murdoccaand V. Heuring, Wiley India.

PAPER-IV
SOFTWARE ENGINEERING

UNIT I

Software Process Models:

The Evolving role of Software, Software - The changing Nature of Software, Legacy software, A generic view of process, layered Technology, Process Framework, The Capability Maturity Model Integration (CMMI), Process Assessment, Personal and Team Process Models, Product and Process, Process Models, Waterfall Model, Incremental Process Model, RAD Model, Evolutionary Process Models, Prototyping, Spiral Model, Concurrent Development Model, Specialized Process Models, Unified Process.

UNIT II

Requirement Engineering:

Software Engineering Practice, communication Practice, Planning practice Modelling practice, Construction Practice, Deployment. Requirements Engineering, Requirements Engineering tasks, initiating the requirements Engineering Process- Eliciting Requirements Developing Use cases, Building the Analysis Models, Elements of the Analysis Model, Analysis pattern, Negotiating Requirements, Validating Requirements.

Unit III

Analysis Modelling:

Requirements Analysis, Analysis Modelling approaches, data modelling concepts, Object oriented Analysis, Scenario based modelling, Flow oriented Modelling, Class based modelling, creating a behavior model.

Unit IV

Design & Testing:

Design Engineering, Design process, Design Quality, Design model, User interface Design Testing strategies, Testing Tactics, strategies Issues for conventional and object oriented software, validation testing, system testing, Art of debugging, Project management

Unit V

Quality & Maintenance:

Software evolution, Verification and Validation, Critical Systems Validation, Metrics for Process, Project and Product, Quality Management, Process Improvement, Risk Management Configuration Management, Software Cost Estimation

Text Books:

1. Fundamentals of Software Engineering, Rajib Mall, PHI Learning Pvt. Ltd.
2. Software Engineering, Ian Sommerville, Pearson Education Inc., New Delhi.
3. Software Engineering: A Practitioner's Approach, Roger S. Pressman, Tata McGraw-Hill
4. Software Project Management, Walker Royce, Pearson Education.

Reference Books:

1. Software Engineering, Shari L, Joanne M. Atlee, Pearson Education, Inc. New Delhi.
2. Software Engineering, Pankaj Jalote, Wiley India Pvt. Ltd., New Delhi.
3. Software Engineering, Dines Bjørner, Springer India Pvt. Ltd., New Delhi.

PAPER-V

INTRODUCTION TO RDBMS (ORACLE)

UNIT-I

Overview of database management system

Database, Definition of DBMS, Purpose of Database System, Data abstraction, Instances and Schema, Data Independence, Data administration roles, Different kinds of DBMS users, Data Dictionary, Data base languages- DDL, DML, DCL Data Models The Relational approach, The Network approach, The Hierarchical approach, DBMS storage structure and access method.

UNIT-II

Entity-relationship model:

Entity - Relationship model as a tool for conceptual design-entities attributes and relationships. ER diagrams; Concept of keys: candidate key, primary key, alternate key, foreign key; Strong and weak entities, Case studies of ER modelling Generalization; specialization and aggregation. Converting an ER model into relational Schema.

UNIT-III

Structured Query Language Relational Algebra

Select, project, cross product different types of joins (inner join, outer joins, self join); set operations, Simple and complex queries using relational algebra. Integrity constraints: Not null, unique, check, primary key, foreign key.

UNIT-IV

Relational Database Design

Normalization concept in logical model; Pitfalls in database design, update anomalies: Functional dependencies, Join dependencies, Normal forms (1NF, 2NF, 3NF). Boyce Code Normal form, Decomposition, Multi-Valued Dependencies, 4NF, 5NF.

UNIT-V

INTRODUCTION TO ORACLE

Introduction to Commercial database query language, SQL & its environment. SQL as a data definition language- creating tables, altering tables, drop tables. SQL as data manipulation language- Inserting, Deleting, Retrieving and updating data in a table. SQL as query language. Introduction to SQL constructs (SELECT ... FROM, WHERE ... GROUP BY ... HAVING ... ORDERBY ...) Temporary tables, Nested queries

Text Books:

1. Fundamentals of Database Systems, R Elmasri & S B. Navathe, Pearson Education.
2. Database Systems Concepts, A Silberschatz, H F. Korth & S. Sudarshan, McGraw-Hill.
3. Fundamentals of Database Management Systems, Mark L. Gillenson, Wiley India Pvt.
4. Introduction To Database Systems, C.J.Date, Longman, Pearson Education

Reference Books:

1. Database Systems: A Complete Book, Molina, Ullman, J. Widom, Pearson Education.
2. Database Systems: Design, Implementation, and Management, Peter Rob & Carlos Coronel, CENGAGE Learning India Pvt. Ltd., New Delhi.
3. Database Systems Using Oracle, Nilesh Shah, PHI Learning Pvt. Ltd., New Delhi.
4. Database Management Systems, R Ramakrishnan, J Gehrke, McGraw-Hill Education
5. Database Development and Management, Lee Chao, Auerbach Publications.

PAPER-VI
WEB TECHNOLOGY

Unit-I

Introduction

Introduction to web, protocols governing the web, web development strategies, Web applications, Introduction to Web Publishing: Introduction, Domain Name Registration, choosing a web host and signing up for an Account, web hosting, web design and development, Testing web site, uploading web pages.

Unit-II

HTML

Introduction, Basic formatting tags: heading, paragraph, line break, bold, italic, underline, superscript, subscript, font and image. Different attributes like align, colour bgcolor, font face, border, size. Navigation Links using anchor tag: internal, external, mail and image links, Link to different web pages and sections. Lists: ordered, unordered and definition, Table tag, HTML Form controls: form, text, password, text area, button, checkbox, radio button, select box, hidden controls, Frameset and frames

Unit-III

Cascading Style Sheet (CSS) and JAVA Script

Usefulness of Style Sheets, Creating Style sheets, Classes and Pseudo Classes, CSS Tags, Background, Font, Text, Position etc.

JavaScript: Overview, Syntax & Conventions, Variables, Expression, Branching & Looping, Function, Array, Objects, Events & Document Object model, Alerts, prompts and conforms.

Unit-IV

PHP

Introduction to PHP, Server side scripting, Role of Web Server software, including files, comments, variables and scope, echo and print, Operators: Logical, Comparison and Conditional operators, Branching statements, Loops, break and continue PHP functions. Passing information between pages, HTTP GET and POST method, String functions: strlen, strpos, strstr, strcmp, substr, str_replace, string case, Array constructs: array(),list() and foreach(), PHP advanced functions: Header , Session, Cookie, Object Oriented Programming using PHP: class, object, constructor, destructor and inheritance.

Unit-V

MySQL

Features of MySQL, data types, Introduction to SQL commands-SELECT, DELETE, UPDATE, INSERT, PHP functions for MySQL operations: mysql_connect, mysql_select_db, mysql_query, mysql_fetch_row, mysql_fetch_array, mysql_fetch_object, mysql_result, Insertion and Deletion of data using PHP, Displaying data from MYSQL in webpage.

Text Book:

1. Xavier, C, "Web Technology and Design", New Age International.
2. Ivan Bayross, "HTML, DHTML, Java Script, Perl & CGI", BPB Publication.
3. Ramesh Bangia, "Internet and Web Design", New Age International.
4. Ullman, "PHP for the Web: Visual Quick Start Guide", Pearson Education.
5. Jim Converse & Joyce Park, "PHP & MySQL Bible", Wiley India Publication
"Internet and Internet Engineering", Daniel Minoli, TMH.
6. Chuckmusiano & Bill Kenndy, O Reilly, "HTML The Definite Guide"
7. Joseph Schmuller, Dynamic HTML, BPB, 2000.

**PAPER-VII
NUMERICAL ANALYSIS**

UNIT-I

Algebraic Equations

Solution of Polynomial and Transcendental Algebraic Equations: Bisection method, Regula-falsi method & Newton's method, Solution of Cubic & Biquadrate Equation, Complex roots of polynomial equations.

UNIT- II

Simultaneous Equations

Simultaneous Equations and Matrix, Gauss-Jordan method, Cholesky's method, Reduction to lower or upper Triangular forms, Inversion of matrix, method of partitioning, Characteristics equation of matrix, Power methods, Eigen values of matrix, Transformation to diagonal forms.

UNIT - III

Curve-Fitting

Curve-Fitting from Observed Data Divided difference table for evenly or unevenly spaced data, polynomial curve-fitting - Newton's, Gauss and Lagrange's form of interpolation and Divided Differences, method of least square for polynomials,.

UNIT - IV

Numerical Differentiation and Integration

Numerical Differentiation and Integration, Forward and Backward differential operators, Newton - cotes integration formula: Trapezoidal Rule, Simpson's Rule, Boole's Rule, Weddle Rule, Legendre's rule, method of weighted coefficients.

UNIT - V

Solution of Differential Equations

Solution of Differential Equations, Numerical Solution of ordinary differential equations, one step method, Taylor's Series, Predictor- Corrector Method, Euler's Method, Runge-Kutta Method, Milne's method.

Text Books:

1. Garewal B.S., "Numerical methods", Khanna Publication.
2. Gupta & Mallic, "Numerical Methods", Krishna Prakashan.
3. Hamming R.W., "Numerical Methods for scientist & Engineers", McGraw Hill.
4. Conle S.D., "Elementary numerical analysis Carl De Boor", International Book Company London.
5. Jain M.K., "Numerical methods for Science and Engineering" Iyengar S.R.K. Calculations (John Willey & Sons).

SYLLABUS
B.C.A. PART-III

LAB-I
RDBMS & WEB TECHNOLOGY
Practical as per syllabi of theoretical paper.

The break-up of marks for Third Year Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	
2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

BCA PART-III
LAB-II
Minor Project

The break-up of marks for Project will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	50