

COMPUTER APPLICATION (COMA)

Class - XII

Full Marks 100

Theory Marks 70

Practical Marks - 30

A. Logic Gate and Combination Circuits

(15 marks)

- Logic Gates – OR, AND, NOT, XOR, X-NOR Gates
- Universal Gates – NAND and NOR Gate
- Basic gates using Universal Gates
- Two Level Circuits
- Combinational Circuits:
 - Half Adder & Full Adder (definition and representation)
 - Full Adder using Half Adders only
 - Half Subtractor & Full Subtractor (definition and representation)
 - 4 bit Adder and Subtractor Circuit
 - Multiplexer (4x1) and De-multiplexer (1x4)
 - Decoder (Maximum 3 bits), and Encoder (Decimal to Binary, Octal to Binary)

B. Networking

(20 marks)

- **Introduction to Networking (Definition, Advantage, Disadvantage, Application)**
 - Analogue and Digital Communication
 - Modes of Communication : Simplex, Half Duplex and Full Duplex Communication
 - Types of Network – LAN, MAN, WAN
 - Network Architecture : Client Server & Peer-to-Peer Networks
 - Serial and Parallel Communication
 - Bandwidth, Channel Capacity, Baud
 - Synchronous and Asynchronous Transmission Modes
 - Baseband and Broadband Networks

SYLLABUS

- **Components of a Network**
 - Servers (File server, Communication Server, Print Server) and Workstation
 - NIC
 - Guided Media
 - Cables – UTP, STP, Co-axial, Fibre Optic
 - Unguided Media
 - Infrared, Radio & Microwave Communication, Satellite
 - Network Operating System – Characteristics
- **Network Topologies -**
 - Bus
 - Ring
 - Star
- **Network Connecting Devices –**
 - Hub
 - Repeater
 - Bridge
 - Switch
 - Router
 - Gateways
- **LAN Protocols**
 - Ethernet (CSMA / CD) and Token Ring Protocol
- **Switching Technique**
 - Circuit, Message and Packet Switching
- **Use of MODEM**
- **TCP / IP Protocols - TCP, IP, UDP, FTP, HTTP, TELNET**
- **IP Addressing**
 - Class A, Class B, Class C IP address
- **Domain Name System**
- **URL**

SYLLABUS

- **Introduction to Internet**
 - Basic requirement for connecting to the Internet, ISP
 - Services provided by Internet – www, browser, e-mail, search engine, social networking
 - Networking Security – Computer Virus, Concept of Firewall, Password
- **HTML**
 - Basic Page Design, Using Ordered and Unordered Lists, Using Image, Hyperlinking, Using Tables

C. Database Management System

(15 marks)

- **Introduction of Database :**
 - Definition of Database
 - Advantage and disadvantages of DBMS
 - Database Languages (DDL, DML, DCL)
 - Data Dictionary, Metadata
 - Database Schema and Instance
 - DBMS and its components
 - Various Data Models – ER Model, Hierarchical Model, Network Model, Relational Model (only concepts)
 - Different Database Users
 - Functions of DBA
- **Relational Model**
 - Concept of Relation, Tuple, Attribute, Domain, Degree, Cardinality
 - Concept of Keys – Key, Super Key, Candidate Key, Primary Key, Alternate Key
 - Concept of Relationships – 1:1, 1:N, N:M relationships
 - Database Constraints – Entity Integrity Constraint, Domain Constraint, Referential Integrity Constraint and Concept of Foreign Key
- **Relational Algebra**
 - Selection Operation
 - Projection Operation
 - Set Operation
 - Cartesian Product
 - Natural Join Operation

SYLLABUS

- **SQL**
 - Simple SELECT Queries (SELECT, FROM, WHERE, DISTINCT, AND, OR, IN, NOT IN, BETWEEN, LIKE, ORDER BY)

D. Introduction to Spread Sheet – (MS Office 2007 or compatible) (10 marks)

- Introduction to Excel
- Concept of Workbook, Worksheet, Row, Column, Cell
- Creating Opening, Editing, Saving a Workbook
- Changing Row and Column widths
- Formatting cells
- Different data types in Excel
- Entering labels and values
- Use of following inbuilt functions only – SUM, PRODUCT, AVERAGE, MAX, MIN, ROUND, COUNT, COUNTIF, IF, AND, OR, NOT, DATE, TIME, NOW, CONCATENATE, UPPER, LOWER
- Copying Cells – Relative, Absolute and Mixed Referencing
- Making calculations and re-calculations
- Auto fill, Fill with series
- Conditional Formatting
- Sorting and Filtering Data (use of Auto Filter)
- Goal Seek
- Hiding Rows and Columns
- Use of Macros
- Creating Line Diagrams, Pie Charts, Bar Graphs

E. Using MS Access (MS Office 2007 or compatible) (10 marks)

- Introduction to Access
- Table creating using Design View and Wizard
- Different data types in Access
- Manipulation of data using Access facilities – Inserting, Updating, Deleting data
- Creating Relationships between Tables
- Form creation using Wizard, Auto Form
- Query generation using Design View
- Report generation using Wizard, Auto Report

F. Practical (30 marks)

- **Using MS Excel and Access (10 marks)**
- **Web Page design using HTML (5 marks)**
- **Project Work (two projects) (10 marks)**
 - **Suggestive Topics:**
- Application of Excel:
 - Using Excel creation of Mark Sheet, Balance Sheet, Monthly / Yearly Expenditure, Reports
 - Web page designing using HTML (minimum 5 linked pages)
 - Travel and Tourism
 - Festivals
 - Book Catalogue
 - Pollution and pollution control
- Viva Voce (5 marks)