

GOPALAN PRE UNIVERSITY COLLEGE(AS752)**Subject & Code :Computer science (41)**

| Chapter No | Topics | |
|---------------|--|---|
| UNIT A | | BACKDROP OF COMPUTERS |
| | | 35 Hrs |
| Chapter 1 | Typical configuration of Computer system | |
| | 1.1 | Introduction |
| | 1.2 | Motherboard |
| | 1.2.1 | Introduction to Motherboard |
| | 1.2.2 | Types of Motherboards |
| | 1.2.3 | Components of Motherboard |
| | 1.3 | Memory |
| | 1.4 | Power supply to the computer system |
| | 1.5 | Assembling the computer system |
| Chapter 2 | Boolean Algebra | |
| | 2.1 | Introduction |
| | 2.2 | Binary valued quantities-constants and variables |
| | 2.3 | Logical operations |
| | 2.3.1 | Logical functions or compound statements |
| | 2.3.2 | Logical operators |
| | 2.4 | Evaluation of Boolean expressions using truth table |
| | 2.4.1 | Basic logic gates |
| | 2.5 | Basic postulates of Boolean Algebra (with proof) |
| | 2.5.1 | Properties of 0 and 1 |
| | 2.5.2 | Idempotence law |
| | 2.5.3 | Involution law |
| | 2.5.4 | Complementarity law |
| | 2.5.5 | Commutative law |
| | 2.5.6 | Associative law |
| | 2.5.7 | Distributive law-different forms |
| | 2.5.8 | Absorption law |
| | 2.6 | De Morgan's theorems |
| | 2.6.1 | De Morgan's I theorem |
| | 2.6.2 | De Morgan's II theorem |
| | 2.6.3 | Applications of De Morgan's theorems |
| | 2.6.4 | Basic duality of Boolean algebra |
| | 2.7 | Derivation of Boolean expressions |
| | 2.7.1 | Min terms |
| | 2.7.2 | Max terms |
| | 2.7.3 | Canonical expressions |
| | 2.7.4 | Minimization of Boolean expressions |
| | 2.8 | Simplification using Karnaugh map |
| | 2.8.1 | Sum-of-product reduction using Karnaugh map |
| | 2.8.2 | Product-of-sum reduction using Karnaugh map |

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| Chapter 3 | Logic gates | |
| | 3.1 | Introduction |
| | 3.1.1 | Invertor (NOT gate) |
| | 3.1.2 | OR gate |
| | 3.1.3 | AND Gate |
| | 3.2 | Derived Gates |
| | 3.2.1 | NOR Gate |
| | 3.2.2 | NAND Gate |
| | 3.2.3 | XOR Gate |
| | 3.2.4 | XNOR Gate |
| | 3.2.5 | Circuit diagram |
| | 3.2.6 | NAND,NOR as universal Gates |
| Chapter 4 | DATA STRUCTURE | |
| | 4.1 | Introduction |
| | 4.2 | Data representation |
| | 4.3 | Classification of Data structures |
| | 4.3.1 | Primitive Data structure |
| | 4.3.2 | Operations on primitive data structures |
| | 4.3.3 | Non-primitive Data structures |
| | 4.3.4 | Linear data structure |
| | 4.3.5 | Non-Linear data structure |
| | 4.4 | Operations on linear data structures |
| | 4.5 | Arrays |
| | 4.5.1 | Types of array Memory representation of data |
| | 4.5.2 | One dimensional array |
| | 4.5.3 | Memory representation one dimensional array |
| | 4.5.4 | Basic operations on one-dimensional array |
| | 4.5.5 | Traversing using one dimension array |
| | 4.5.6 | Searching an element |
| | 4.5.7 | Insertion of an element |
| | 4.5.8 | Deletion of an element |
| | 4.5.9 | Sorting the elements |
| | 4.5.10 | Two dimension Array |
| | 4.6 | Stacks |
| | 4.6.1 | Introduction |
| | 4.6.2 | Representation of stacks in memory |
| | 4.6.3 | Operations on stacks |
| | 4.6.4 | Applications of Stacks |
| | 4.7 | Queues |
| | 4.7.1 | Introduction |
| | 4.7.2 | Types of Queues |

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|---------------|-----------------------|--|
| | 4.7.3 | Operations on queues |
| | 4.7.4 | Memory representation of queues |
| | 4.7.5 | Applications of Queues |
| | 4.8 | Linked lists |
| | 4.8.1 | Introduction |
| | 4.8.2 | Types of linked list |
| | 4.8.3 | Operations on single linked lists |
| | 4.9 | Non-Linear data structure |
| | 4.9.1 | Introduction |
| | 4.9.2 | Trees |
| | 4.9.3 | Graphs |
| UNIT B | | COMPUTING IN C++ |
| | | 45 Hrs |
| Chapter 5 | | Review of C++ |
| | 5.1 | Review of c++ language |
| | 5.2 | Fundamentals of c++ |
| | 5.3 | Structure of c++ program |
| | 5.4 | Libraray functions |
| | 5.5 | Data types |
| | 5.6 | Input and output operations |
| | 5.7 | Control statements |
| | 5.8 | Arrays |
| | 5.9 | Functions |
| | 5.10 | User-defined Functions |
| | 5.11 | Structures |
| Chapter 6 | Basic concepts of OOP | |
| | 6.1 | Introduction |
| | 6.2 | Basic concepts of OOP |
| | 6.2.1 | Objects |
| | 6.2.2 | Classes |
| | 6.2.3 | Data Abstraction |
| | 6.2.4 | Data Encapsulation |
| | 6.2.5 | Inheritance |
| | 6.2.6 | Overloading |
| | 6.2.7 | Polymorphism |
| | 6.2.8 | Dynamic Biding |
| | 6.2.9 | Message passing |
| | 6.3 | Advantages of OOP over earlier programming methods |
| | 6.4 | Limitations of OOP |
| | 6.5 | Applications of OOP |

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| Chapter 7 | Classes and objects | |
| | 7.1 | Introduction |
| | 7.2 | Definition and declaration of classes and objects |
| | 7.3 | Access specifiers (scope of class & its members) |
| | 7.3.1 | Private |
| | 7.3.2 | Public |
| | 7.3.3 | Protected |
| | 7.4 | Members of the class |
| | 7.5 | Member functions |
| | 7.5.1 | Member functions inside class definition |
| | 7.5.2 | Member functions out side class definition |
| | 7.6 | Defining objects of a class |
| | 7.7 | Arrays as members of class |
| | 7.8 | Array of objects |
| | 7.9 | Objects as function arguments |
| | 7.10 | Differences between structures and classes in C++ |
| Chapter 8 | Function overloading | |
| | 8.1 | Introduction |
| | 8.2 | Need for function overloading |
| | 8.3 | Definition and declaration of overloaded function |
| | 8.4 | Restrictions on overloaded function |
| | 8.4.1 | Calling over loaded functions |
| | 8.5 | Other functions in a class |
| | 8.5.1 | Inline function |
| | 8.5.2 | Friend function |
| Chapter 9 | Constructor and Destructor | |
| | 9.1 | Introduction |
| | 9.2 | Declaration and definition of constructor |
| | 9.3 | Types of constructors |
| | 9.3.1 | Default constructor |
| | 9.3.2 | Parameterized constructor |
| | 9.3.3 | Copy constructor |
| | 9.4 | Constructor overloading |
| | 9.5 | Destructor |
| Chapter 10 | Inheritance(Extending classes) | |
| | 10.1 | Introduction |
| | 10.2 | Base class |
| | 10.3 | Derived class |
| | 10.3.1 | Defining derived class |
| | 10.3.2 | Public derived class |
| | 10.3.3 | Private derived class |

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| | 10.3.4 | Protected dervied class |
| | 10.4 | Visibility modes |
| | 10.4.1 | Public inheritance |
| | 10.4.2 | Private inheritance |
| | 10.4.3 | Protected inheritance |
| | 10.5 | Levels of inheritance |
| | 10.5.1 | Single level inheritance |
| | 10.5.2 | Multilevel inheritance |
| | 10.5.3 | Multiple inheritance |
| | 10.5.4 | Hierarchical inheritance |
| | 10.5.5 | Hybrid inheritance |
| | 10.6 | Relationship between classes |
| | 10.6.1 | Virtual base classes |
| | 10.6.2 | Abstract classes |
| | 10.6.3 | Constructors in Derived classes |
| | 10.6.4 | Destructors in Dervied classes |
| Chapter 11 | Pointers | |
| | 11.1 | Introduction |
| | 11.2 | Memory representation of pointers |
| | 11.3 | Declaration & initialization of pointers |
| | 11.4 | Address operator |
| | 11.5 | Pointer operator(indirection operator) |
| | 11.6 | Pointer arithmetic |
| | 11.7 | Pointer and arrays |
| | 11.8 | Arrays of pointers |
| | 11.9 | Pointers to strings |
| | 11.10 | Pointer as function parameters |
| | 11.11 | Pointer and structures |
| | 11.12 | Memory allocation of pointers(static and dynamic) |
| | 11.12.1 | Static allocation of memory |
| | 11.12.2 | Dynamic allocation of memory-new and delete |
| | 11.13 | Free store (heap memory) |
| | 11.14 | Memory leak |
| | 11.15 | Self Referential Structure |
| | 11.16 | Pointers and functions |
| | 11.16.1 | Invoking functions by passing the references |
| | 11.16.2 | Invoking functions by passing the pointers |
| | 11.17 | Memory comes and memory goes |
| | 11.18 | Pointer and objects |
| | 11.19 | this pointer |

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| Chapter 12 | Data file handling | |
| | 12.1 | Introduction |
| | 12.2 | Header files(fstream.h) |
| | 12.2.1 | Classes for file stream operation |
| | 12.3 | Types of data files |
| | 12.3.1 | Text file |
| | 12.3.2 | Binary file |
| | 12.4 | Opening & closing files |
| | 12.4.1 | Opening file using constructor |
| | 12.4.2 | Using open() |
| | 12.4.3 | File modes -In ,out, app modes |
| | 12.4.4 | closing files |
| | 12.5 | Input and output operation in text files |
| | 12.6 | Detecting end of file |
| | 12.7 | File pointers -tellg(), tellp(), seekg(), seekp() functions |
| UNIT C LARGE DATA, DATABASE & QUERIES | | |
| Chapter 13 | Database Concepts | |
| | 13.1 | Introduction |
| | 13.2 | Applications of database |
| | 13.3 | Origin of Data : Facts,data,information,features |
| | 13.4 | Evolution of database |
| | 13.5 | Data processing cycle |
| | 13.6 | Data base terms |
| | 13.7 | Data Types in DBMS |
| | 13.8 | DBMS |
| | 13.9 | Data abstraction |
| | 13.10 | Data independence |
| | 13.11 | Database Model |
| | 13.11.1 | Hierarchial data model |
| | 13.11.2 | Network data Model |
| | 13.11.3 | Relational Data model |
| | 13.12 | Codd's Rules |
| | 13.13 | Logical data concepts |
| | 13.13.1 | Normalization |
| | 13.13.2 | Entity-relationship Model |
| | 13.13.3 | Cardinality |
| | 13.14 | KEYS-Primary,Secondary,Candidate,Foreign, Alternate |
| | 13.15 | Relational Algebra |
| | 13.16 | Data warehousing |
| | 13.17 | Data Mining |

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| Chapter 14 | Structured Query Language | |
| | 14.1 | Introduction |
| | 14.1.1 | SQL Architecture |
| | 14.2 | SQL commands |
| | 14.2.1 | DDL |
| | 14.2.2 | DML |
| | 14.3 | Data types in SQL |
| | 14.3.1 | Exact Numeric data types |
| | 14.3.2 | Floating point Numeric data types |
| | 14.3.3 | Date and time data types |
| | 14.3.4 | Character and string data type |
| | 14.4 | Operators in SQL |
| | 14.4.1 | SQL arithmetic operators |
| | 14.4.2 | Comparison operators |
| | 14.4.3 | Logical operators |
| | 14.5 | SQL expressions |
| | 14.5.1 | SQL Boolean Expression |
| | 14.5.2 | SQL Numeric expression |
| | 14.5.3 | Date expression |
| | 14.6 | SQL constraints |
| | 14.6.1 | Primary key |
| | 14.6.2 | Foreign Key or Referential integrity |
| | 14.6.3 | Not NULL constraint |
| | 14.6.4 | Unique Key |
| | 14.6.5 | Check constraint |
| | 14.7 | Implementation of SQL Commands |
| | 14.7.1 | Create table statement |
| | 14.7.2 | Alter |
| | 14.7.3 | Insert Statement |
| | 14.7.4 | Select statement |
| | 14.7.5 | AND operator |
| | 14.7.6 | OR operator |
| | 14.7.7 | Update statement |
| | 14.7.8 | Delete Statement |
| | 14.7.9 | Order by |
| | 14.7.10 | Group by |
| | 14.7.11 | Distinct statement |
| | 14.7.12 | Join |
| | 14.7.13 | NULL |
| | 14.8.1 | Create View |
| | 14.9.1 | Commit |

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| | 14.10 | DCL commands |
| | 14.10.1 | Grant command |
| | 14.10.2 | Revoke command |
| | 14.11 | Built-In Function |
| | 14.11.1 | Single row function |
| | 14.11.2 | Group function |
| UNIT D ADVANCED CONCEPTS IN COMMUNICATION TECHNOLOGY 20Hrs | | |
| Chapter 15 | Networking Concepts | |
| | 15.1 | Introduction |
| | 15.1.1 | Networking Goals |
| | 15.1.2 | Need of networking |
| | 15.2.1 | Arpanet |
| | 15.2.2 | OSI reference Model |
| | 15.2.3 | TCP/IP |
| | 15.3.1 | HTTP |
| | 15.3.2 | FTP |
| | 15.3.3 | SLIP |
| | 15.4.1 | Internet |
| | 15.4.2 | Interspace |
| | 15.4.3 | Elementary terminologies of networking |
| | 15.4.4 | Types of services |
| | 15.4.5 | Types of networking |
| | 15.4.6 | Networking Topologies |
| | 15.4.7 | Transmission medium |
| | 15.4.8 | Switching techniques |
| | 15.4.9 | Communication modes |
| | 15.4.10 | Networking devices |
| | 15.5.1 | Gateway |
| | 15.6.1 | SIM |
| | 15.7.1 | GPRS |
| | 15.8.1 | Applications of Networking |
| | 15.8.2 | Wi-fi |
| | 15.9.1 | Network security |
| | 15.10.1 | Cookies |
| | 15.11.1 | Virus |
| Chapter 16 | Internet and Open source concepts | |
| | 16.1 | Introduction |
| | 16.1.2 | Free software |
| | 16.1.3 | Open source software |
| | 16.1.4 | OSS and FLOSS |

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| | 16.1.5 | GNU |
| | 16.1.6 | FSF |
| | 16.2.1 | OSI |
| | 16.2.2 | W3C |
| | 16.2.3 | Proprietary software |
| | 16.2.4 | www |
| | 16.2.5 | Telnet |
| | 16.2.6 | Web browser |
| | 16.2.7 | Webserver |
| | 16.2.8 | Webpage |
| | 16.3 | URL and domain |
| | 16.4 | E-Commerce |
| | 16.4.1 | Types of E-commerce |
| | 16.4.2 | Advantages of e-commerce |
| | 16.5 | IPR issues |
| Chapter 17 | Web designing | |
| | 17.1 | Introduction |
| | 17.1.1 | HTML structure |
| | 17.2.1 | Advanced HTML tags/commands |
| | 17.2.2 | Text formating |
| | 17.2.3 | Resizing text |
| | 17.2.4 | Example for resizing text |
| | 17.2.5 | Text layout |
| | 17.2.6 | Number listing |
| | 17.2.7 | Links |
| | 17.2.8 | Inserting images |
| | 17.2.9 | Background |
| | 17.2.10 | Background color and fixed images |
| | 17.2.11 | Tables |
| | 17.2.12 | Frames |
| | 17.2.13 | Forms |
| | 17.2.14 | Settings and text fields |
| | 17.3.1 | Web Hosting |
| | 17.3.2 | Domain registration |
| | 17.4.1 | Uploading HTML file |
| | 17.5.1 | XML |
| | 17.6.1 | DYNAMIC HTML |
| | 17.7.1 | Web scripting |
| | | Model Question Paper |

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Subject & Code :Computer science (41)

DESIGN OF QUESTION PAPER

CLASS: SECOND PUC

SUBJECT: COMPUTER SCIENCE (41)

Time : 3Hours 15 Minutes(of which minutes for reading the questions Paper).

Max.Marks:70

The weightage of the distribution of marks over different dimensions of the question paper shall be as follows:

Weightage to Objectives:

| Objective | Weightage | Marks |
|----------------------|------------------|--------------|
| Knowledge | 30% | 31 |
| Understanding | 40% | 43 |
| Application | 20% | 21 |
| Skill | 10% | 10 |
| Total | 100% | 105 |

Weight age to Content/Subject units: Computer Science(41)

| Unit | Description | VSA(1 Mark) | SA(2 Marks) | LA(3 Marks) | E(5Marks) | Total Marks |
|-----------------------|---|--------------------|--------------------|--------------------|------------------|--------------------|
| <i>A</i> 35 Hrs | BACKDROP OF COMPUTERS | 3 | 2 | 3 | 3 | 31 |
| <i>B</i> 45Hrs | COMPUTING IN C++ | 2 | 3 | 2 | 5 | 39 |
| <i>C</i> 20Hrs | LARGE DATA, DATABASE & QUERIES | 1 | 2 | 1 | 2 | 18 |
| <i>D</i> 20Hrs | ADVANCED CONCEPTS IN COMMUNICATION TECHNOLOGY | 4 | 1 | 2 | 1 | 17 |
| | Total Marks | 10 | 16 | 24 | 55 | 105 |
| 120 Hrs | Total No of Questions to be answered | 1X10=10 | 2X5/8=10 | 3X5/8=15 | 5X7/11=35 | 70/37 |

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| UNIT | DESCR IPT ION | VSA (1 Mark) | SA (2 Marks) | LA (3 Marks) | E (5 Marks) | Total Marks |
|----------------------|---|-----------------|-----------------|-----------------|----------------|----------------|
| A 35 Hrs | BACKDROP OF COMPUTERS | 3 | 2 | 3 | 3 | 31 |
| Chapter 1 5 Hrs | Typical configuration of Computer system | 1 | ----- | 1 | ----- | 4 |
| Chapter 2 10 Hrs | Boolean algebra | ----- | 2 | ---- | 1 | 09 |
| Chapter 3 5 Hrs | Logic Gates | 1 | ----- | 1 | ----- | 04 |
| Chapter 4 15 Hrs | Data structures | 1 | ----- | 1 | 2 | 14 |
| B 45Hrs | COMPUTING IN C++ | 2 | 3 | 2 | 5 | 39 |
| Chapter 5 3 Hrs | Review of C++ covered in First PUC | ----- | ----- | ----- | ----- | ---- |
| Chapter 6 4 Hrs | OOP concepts | ---- | 1 | ---- | 1 | 07 |
| Chapter 7 6 Hrs | Classes and objects | 1 | ----- | ----- | 1 | 06 |
| Chapter 8 3 Hrs | Function Overloading | ----- | ----- | ----- | 1 | 05 |
| Chapter 9 8 Hrs | Constructors and Destructors | ---- | 1 | ---- | 1 | 07 |
| Chapter 10 8 Hrs | Inheritance | ----- | ----- | ----- | 1 | 05 |
| Chapter 11 7 Hrs | Pointers | 1 | ----- | 1 | ----- | 04 |
| Chapter 12 6 Hrs | Data File handling | ----- | 1 | 1 | ----- | 05 |
| C 20Hrs | LARGE DATA, DATABASE & QUERIES | 1 | 2 | 1 | 2 | 18 |
| Chapter 13 8 Hrs | Database concepts | 1 | 1 | 1 | 1 | 11 |
| Chapter 14 12 Hrs | SQL commands | ----- | 1 | ---- | 1 | 07 |
| D 20Hrs | ADVANCED CONCEPTS IN COMMUNICATIO N TECHNOLOGY | 4 | 1 | 2 | 1 | 17 |
| Chapter 15 10 Hrs | Networking Concepts | 2 | 1 | ---- | 1 | 9 |
| Chapter 16 5 Hrs | Internet and Open source concepts | 1 | ---- | 1 | ----- | 4 |
| Chapter 17 5 Hrs | Web Designing | 1 | ----- | 1 | ----- | 4 |
| | Total Marks | 10 | 16 | 24 | 55 | 105 |
| | Total No of Questions to be answered | 1X 10=10 | 2X 5/8=10 | 3X5/8=15 | 5X7/11=35 | 70/37 |

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List of programs to be conducted in practical sessions

Section A C++ and Data structure

Write a program to find the frequency of presence an element in an array.

Write a program to insert an element into an array at a given position.

Write a program to delete an element from an array from a given position

Write a program to sort the elements of an array in ascending order using insertion sort.

Write a program to search for a given element in an array using Binary search method.

Write a program to create a class with data members principle, time and rate. Create member functions to accept data values to compute simple interest and to display the result.

Write a program to create a class with data members a, b, c and member functions to input data, compute the discriminant based on the following conditions and print the roots.

If determinant=0, print the roots that are equal

If the discriminant is>0, print the real roots

If the discriminant<0, print that the roots are imaginary

Program to find the area of a square/rectangle/triangle using function overloading.

Program to find the cube of a number using inline functions.

Write a program to find the sum of the series $1 + x + x_2 + \dots + x_n$ using constructors.

Create a base class containing the data members roll number and name.

Also create a member function to read and display the data using the concept of single level inheritance. Create a derived class that contains marks of two subjects and total marks as the data members.

Create a class containing the following data members register No., name and fees. Also create a member function to read and display the data using the concept of pointers to objects.

Write a program to perform push items into the stack.

Write a program to pop elements from the stack.

Write a program to perform enqueue and dequeue.

Write a program t o create a linked list and appending nodes.

Section B SQL

Generate the Electricity Bill for one consumer

Create a student database and compute the result.

Generate the Employee details and compute the salary based on the department.

Create database for the bank transaction.

Section C HTML

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Write a HTML program to create a study time-table.
Create an HTML program with table and Form.