

GROUP CODE: CS

MAX MARKS: 100

COMPUTER SCIENCE & ENGG

(INCLUDING INFORMATION SCIENCE &ENGINEERING)

1. Introduction to Computer Concepts

Characteristics of Computer, Classification of Computers, Classification according to purpose, Classification according to Type of Data-Handled Techniques, Classification according to Functionality, Central Processing Unit(CPU), Input, Output and Storage Units, Applications of Computers, Primary Memory Representation, Memory Hierarchy, Storage Evaluation criteria, Random Access Memory(RAM) (Basics), Types of RAM , Read Only Memory(ROM) (Basics), Types of ROM , Benefits of Secondary Storage, Classification of Secondary Storage, Magnetic Tape, Magnetic Tape Organization, Advantages and Disadvantages of Magnetic tapes, Magnetic Disk, Storage organization of a Magnetic Disk, Storage capacity of Magnetic Disk, Accessing Data from a magnetic disk, Types of Magnetic Disks(Floppy Disk, Hard Disk and Zip Disk), Advantages and Disadvantages of Magnetic Disks, Optical Disk, Storage organization of optical disk, Storage capacity of Optical Disk, Types of Optical disk(CD-ROM and DVD), Advantages and Disadvantage of Optical Disk, Importance of Input Devices, Types of Input Devices, Keyboard, Mouse, Track Ball, Joy Stick, Light Pen, Touch Screen, Digital Camera, Scanners(handheld and Flatbed Scanners), Optical Scanners (OCR, OMR, MICR, barcode Reader), Classification of Output, Hard copy Versus Soft copy, Hard copy output Devices, Printers, Impact Printers (Dot Matrix, Daisy Wheel), Non-Impact Printer (Inkjet and Laser Printers), and Plotters, Types of Plotters (Drum and Flat belt Plotters), Soft copy Output devices, Monitors, CRT, Audio Output, Terminals

1 x 15=15 Marks**2. Digital Electronics**

Digital signals, Types of logics, logic gates-Basic gates, truth table, Universal gates, mutually exclusive gates (Ex-OR, Ex-NOR), Boolean constants, variables & functions , Laws of Boolean algebra , De-Morgan's Theorems ,SOP & POS , Simplification , Arithmetic Circuits, Adders, & Subtractors , Serial & Parallel adders, Comparators, Encoders, Decoders, Multiplexers and DeMultiplexers, Flip- Flops - Introduction, Triggering Methods, RS, D, T, JK FF , and MS-JK flip-flop - Applications. Counters - Types including MOD-Counter, Applications, Shift Registers- Modes of operation, Ring & Johnson Counters - Applications.

1 x 05=05 Marks**3. C-Programming**

Character set, Variable and Identifiers, Built-in Data Types, Variable Definition, Declaration, C Key Words-Rules & Guidelines for Naming Variables, Arithmetic operators and Expressions, Constants and Literals, Precedence and Order of Evaluation, Simple assignment statement, Basic input/output statement, Conditions, Relational Operators, Logical Operator. If

statement, if-else statement, Break, Continue, Switch, Go to and Labels, Loop statements. What is an Array?, Declaring an Array, Initializing an Array. One dimensional arrays: Array manipulation; Declaring & Initialization of Two dimensional arrays, Null terminated strings as array of characters. Declaring & Initializing string variables, Reading & writing strings from variables, Arithmetic operations & characters, String handling functions, Basics of Structures, Structure variables, initialization, structure assignment, nested structure, structures and arrays: arrays of structures, Unions, Size of structures, Bit fields, Definition of Functions, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Block structure, Passing arguments to a Function: call by value, arrays as function arguments, Structure and functions, Concept of pointers, Declaring and initializing pointers, Accessing variables using pointers, Pointer arithmetic, Pointers and arrays, Pointers and character strings, Pointers and functions, Pointer as a function argument, Pointers to function, pointers and structures, Dynamic Memory allocation, Dynamic memory allocation, Allocating a block of memory : Malloc, Calloc, Free, Realloc, Defining and opening a file, Closing a file, Input / Output operations on files, Error handling during I/O operations, Random Access to files, Command line arguments.

1 x 15=15 Marks

4. Data Structures

Data and information, Types of data structures, Primitive & non – primitive data structures, The Stack, Definition and examples, Primitive Operations- Push and Pop, Applications of Stacks, Infix, Postfix and Prefix Expressions, Recursive definition, The queue and its sequential representation, Linked linear lists, Circular linked lists, Doubly linked list, Binary trees, Complete binary tree, Binary tree representation, Traversal of a binary tree.

1 x 10=10 Marks

5. Computer Networks

TCP/IP Protocol suite, Physical and Data Link Layers, Network Layer, Transport Layer, Application Layer, Guided Media, Twisted Pair Cable, Co-axial Cable, Fiber-Optic Cable, Wireless, Radio Waves, Micro Waves, Infrared, Multiple Access, Random Access, Aloha, CSMA, CSMA/CD, CSMA/CA, Connecting LANs, Backbone networks and Virtual LANs, Connecting Devices, Passive Hubs, Repeaters, Active Hubs, Bridges, Two-Layer Switches, Routers, Three-Layer Switches, Gateways.

1 x 10=10 Marks

6. Object-oriented Programming with C++

Reference variables, Operators in C++: Scope resolution operator, Member dereferencing operators, Memory management operators Manipulators (setw & endl) Type cast operator, Function prototyping, Call by reference, Return by reference, Inline functions, Default arguments, Function overloading, Classes and Objects, C structures revisited, Specifying a class, Creating objects, Accessing class members, Defining member functions, Outside the class definition, Inside the class definition, Memory allocation for objects, Static data

members, Static member functions, Arrays within a class, Arrays of objects, Constructors & Destructors, Default constructors, Parameterized constructor, Overloaded constructor, Constructor with default argument, Copy constructor, Destructor, Objects as function arguments, Returning objects from functions, Friend functions, Friend Class (only definition), Operator Overloading, Defining operator overloading, Overloading unary operator, Overloading binary operator, Overloading binary operator using friends, Manipulation of strings using operators, Rules for overloading operator, Defining Derived classes, Single Inheritance, Making a private member inheritable, Multilevel inheritance, Multiple inheritance, Ambiguity resolution in inheritance, Hierarchical inheritance, Hybrid inheritance, Virtual base classes, Abstract classes, Constructors in Derived classes, Containership : nesting of classes, Pointers to objects, this pointer, Pointers to derived classes, Virtual function, Rules for virtual functions, Pure virtual function, C++ streams, C++ stream classes for console I/O operations, Unformatted I/O operations, Formatted console I/O operations, Managing output with Manipulators, Classes for file stream operations, Opening and closing a file, Detecting end of file, File modes, File pointers and their manipulation, Sequential I/O operations, Updating a file : Random Access, Error handling functions, Command line arguments, Class templates, Function templates, Member function templates, Non Type Template argument.

1 x 15= 15 Marks

7. JAVA Programming

Interfaces: Multiple Inheritance, Defining Interfaces, Extending Interfaces, Implementing Interfaces , Accessing Interface Variables , Packages: Putting Classes Together, Java API Packages , Using System Packages , Naming Conventions, Creating Packages , Accessing a Package , Using a Package , Adding a Class to a Package, Hiding Classes, Static Import, Multithreaded Programming , Creating Threads , Extending the Thread Class, Stopping and Blocking a Thread , Life Cycle of a Thread , Using Thread Methods , Thread Exceptions , Thread Priority , Synchronization , Implementing the 'Runnable' Interface , Inter-thread Communication.

1 x 05= 05 Marks

8. Operating Systems

Process concept , Process scheduling , Operations on processes , Inter-process communication, Process Scheduling concepts, Scheduling criteria , Scheduling algorithms, memory management strategies, Swapping , Contiguous memory allocation, Paging, Structure of page table, Segmentation

1 x 10= 10 Marks

9. DBMS

Characteristics of the database approach, Actors on the scene, Workers behind the scene, Advantages of using the DBMS Approach, Data Models, Schemas, and Instances, Database Languages and Interfaces, Classification of database Management System, Entity Types, Entity Sets, attributes and keys, Relation Types, Relationship Sets, roles and structural constraints,

Weak Entity Types, ER Diagrams, naming, conventions and design issues, SQL: DML, DDL & DCL related commands.

1 x 05=05 marks

10. Web Programming

Introduction to XML, The Syntax of XML, XML Document Structure, Document Type Definitions, Declaring Elements, Declaring Attributes, Declaring Entities, Internal & External DTDs, Namespaces, XML Schemas, Defining the Schema, Defining the Schema Instances. Origins and Uses of PHP: Overview , General Syntactic Characteristics, Primitives, Operations and Expressions, Variables, Integer Type, Double Type, String Type, Boolean Type, Arithmetic Operations & Expressions , String Operations, Scalar Type conversions, Output, Control statements, Relational Operators, Boolean Operators, Selection Statements, Loop statements, Arrays, Array Creation, Accessing array Elements, Functions for Dealing with Arrays, Functions, General Characteristics of Functions, Parameters, The scope of Variables, The Lifetime of Variables, Pattern Matching.

1 x 10= 10 Marks