SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES.
(AUTONOMOUS)
MCA   DEPARTMENT

QUESTIONBANK

Subject Name : DATA STRUCTURES USING C

Subject Code : 24MCA112

Year &Sem :I & I

SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES.

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CHITTOOR

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

QUESTION BANK

For

DATA STRUCTURES USING C (24MCA112)

Regulation – 2024

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S. No	QUESTIONS	Blooms Taxonomy Level
	UNIT –I	
	INTRODUCTION TO THE C LANGUAGE: Introduction to C Language - C Language Elements, Variable Declarations and Data Types, Operators and Expressions, Decision Statements - If and Switch Statements, Loop Control Statements -while, for, do-while Statements. Introduction to Functions, Storage classes, Arrays, Structures, Unions, Pointers, Strings and Command line arguments.	
	Part –A	
	Question	**Bloom's Level**
1.	List any two data types in C.	
2.	Define a variable in C.	L1
3.	What is a keyword & Identifier in C?	L1
4.	Define a function.	L1
5.	List any two storage classes in C.	L1
6.	What is a pointer?	L2
7.	Define an array.	L1
8.	How is a structure different from a union?	L2
9	What is recursion?	L1
10	Name two string functions in C.	L2
	Part - B	
1	Explain various data types and variables in C with examples.	L2
2	Write a program to find the factorial of a number using recursion.	L3
3		L2
4	Explain different loop control statements (for, while, do-while) with examples.	L2
5	Explain call by value and call by reference with suitable programs.	L2
6	Write a C program to demonstrate the use of structures.	L3
7	Compare structures and unions with examples.	L4
8	Write a C program to swap two numbers using pointers.	L3
9	xplain string handling functions like strcpy, strlen, strcat, strcmp with examples.	L2
10	Create a program to read and print employee data using array of structures.	L6
11	Explain different storage classes (auto, static, register, extern) in C.	L2

UNIT -II
Overview of Data Structure, Representation of a Stack, Stack Related Terms, Operations on a Stack, Implementation of a Stack, Evaluation of Arithmetic Expressions, Infix, Prefix, and Postfix Notations, Evaluationof Postfix Expression, Conversionof ExpressionfromInfix toPostfix, Queues - Representation of Queue, Insertion, Deletion, Searching Operations.
Part - A

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1	Define a stack.	L1
2	List any two stack operations.	L1
3	What is the difference between LIFO and FIFO?	L2
4	What is an infix and postfix expression? Give an example	L1
5	Define queue.	L1
6	List any two applications of a stack.	L1
7	What is underflow in a stack?	L2
8	Mention two operations possible in a queue.	L1
9	Write the infix form of the expression: ABC*+.	L3
10	What is underflow in a stack?	L2
11	What is a circular queue?	L2
	Part – B	
1	Explain stack operations (push, pop, peek) with suitable examples.	L2
2	Convert the infix expression (A + B) * (C - D) to postfix and explain the steps.	L3
3	Differentiate between infix, prefix, and postfix notations with examples.	L2
4	Write an algorithm to convert infix to postfix expression.	L3
5	Explain the implementation of a queue using an array with insertion and deletion operations.	L2
6	Describe the steps for evaluation of a postfix expression using a stack.	L2
7	Explain the concept of circular queue. How does it overcome the limitation of a linear queue?	L2
8	Write the algorithm to convert infix to postfix and evaluate the postfix expression.	L6

	UNIT- III	
	Singly Linked List, Polynomials Using Singly Linked Lists, Using Circularly Linked Lists, Insertion, Deletion and Searching Operations, Doubly linked lists and its operations, Circular linked lists and its operations	
	Part - A	
1	What is a linked list?	L1
2	List any two types of linked lists.	L1
3	What is a singly linked list?	L1
4	What is a circular linked list?	L2
5	Define a doubly linked list.	L1
6	State any one application of a circular linked list.	L1
7	Define polynomial representation using linked list.	L1
8	What is the difference between singly and doubly linked lists?	L2
	Part – B	
1	Explain the structure and operations (insertion and deletion) of a singly linked list.	L2

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2	Design an algorithm to delete a node with a given value from a singly linked list.	L3
3	Write a program to add two polynomials using linked lists.	L6
4	Implement a doubly linked list with insertion and deletion at both ends.	L3
5	Write a program to insert and delete nodes in a circular singly linked list.	L3
6	Draw and explain the structure of a circular doubly linked list.	L2

. UNIT- IV	
Tree terminology, representation, Binary tress, representation, Binary tree traversals. Binary Tree Operations, Graphs- Graph terminology, Graph representation, Elementary Graph Operations, Breadth first search (BFS) and Depth first search (DFS), Spanning Trees.	
Part- A	
1	Define root, leaf, and internal node in a tree.	L1
2	What is a binary tree?	L1
3	List two types of binary trees.	L2
4	What is inorder traversal?	L1
5	List types of binary tree traversals.	L2
6	What is the purpose of the stack in DFS and queue in BFS?	L2
7	What is a spanning tree?	L1
8	What is a self-loop in graph terminology?	L1
9	Define vertex and edge.	L1
10	Name two operations on binary trees.	L2
Part – B	
1	Explain tree terminology with diagrams.	L1
2	Explain binary tree traversals (inorder, preorder, postorder) with examples and algorithms.	L3,L4
3	Write and explain insertion and deletion algorithms for a Binary Search Tree (BST) with examples.	L3,L4
4	Explain BFS and DFS algorithms with step-by-step traversal of a sample graph..	L3,L4
5	Explain spanning trees. Describe Kruskal's or Prim's algorithm with a worked example.	L3,L4
6	Describe the process of inserting and deleting vertices and edges in a graph.	L3,L4
7	Explain Graph terminology with diagrams.	

. UNIT- V

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	Sequential,Binary,Exchange(Bubble)Sort,SelectionSort,InsertionSort,QuickSort,MergeSort,Heap Sort. Searching- Linear and Binary Search Methods.	
	Part- A	
1	Define Binary search	L1
2	What is Bubble sort?	L1
3	Define Quick sort,Merge sort	L1
4	What is Heap sort	L1
5	State any two differences between linear and binary search.	L1
6	What is the role of the pivot in quick sort?	L1
7	List any two divide-and-conquer based sorting algorithms.	L1
8	Define linear search.	L1
	Part – B	
1	Explain bubble sort and selection sort with algorithms	L1
2	Describe the working of merge sort. Write algorithm and trace it with an example.	L3,L4
3	Explain quick sort with partition logic. Trace step-by-step with example array.	L3,L4
4	Write an algorithm for binary search and explain its working with an example.	L3,L4
5	Write an algorithm for binary search and explain its working with an example.	L3,L4
6	Write an algorithm for Linear search and explain its working with an example.	L3,L4
7	Discuss heap sort algorithm with heap construction and sorting phase.	L3,L4
8	Explain sequential sort with algorithms	L1