Data Structures Question Bank

UNIT-I

(Introduction to Data Structures and Pointers)

2 Marks

1. Define data structure. List out its types.
2. Define pointer. How to initialize pointer.
3. List out primitive and non-primitive data structures.
4. What is pointer topointer how to declare it.
5. What is dynamic and static memory allocation.
6. What are primitive and non-primitive data structures? Give examples.
7. List advantages of pointer.
8. State the use of calloc( )function with syntax.
9. List applications of data structures.

5/10 Marks

10. What are operations on data structures? List out.
11. Explain with syntax malloc() , calloc( ), realloc( ) and free( ).
12. Write a C program to print sum of array elements using dynamic memory allocation.
13. What is dynamic memory allocation? Explain DMA functions.
1. 14, Explain pointer and structure.
14. Discuss classification of data structures with example.
15. Explain dynamic memory allocation.
16. Differentiate static and dynamic memory allocation.
17. What are advantages and disadvantages of pointers.
18. Write a note on pointers and arrays.
19. Demonstrate call by reference and call by value with an example.
20. Write a program to implement dynamic array find smallest and largest element in an array.

UNIT-II

(Recursion, Searching and Sorting)

2 Marks

1. What is recursion. Give an example.
2. Differentiate linear search and binary search.
3. Define searching and sorting.
4. What is the difference between bubble sort, selection sort and insertion sort.

5/10 Marks

1. Write a C program to find GCD of two numbers using recursion.
2. Write a C program to search an element in an array using sequential search.
3. Write a note on Towers of Hanoi.
4. Explain the concept of Bubble sort technique with an example.
5. Write a C program to print n Fibonacci numbers using recursion.
6. .Apply quick sort technique and sort the following numbers in Ascending order, also write quick sort function for the same.

   56, 24, 43, 92, 52, 41, 32

7. Write a C program for insertion sort.
8. Write a C program for binary search and find the given no from list key = 21.

   5 9 13 16 19 21

9. Write a C program for towers of Hanoi.
10. Write a C program for Bubble sort technique.
11. Compare quick and selection sort.
12. Explain merge sort with an example.
13. Write a C program to generate binomial coefficient using recursion.
14. Write a C program to find factorial of a given number using recursion.

UNIT-III

(Stack and Queue)

2 Marks

1. What is stack? List out the operations on stack.
2. Convert the given expression into postfix expression
3. i,A/B*(C+D/E)-F ii. (A+B) / (C-D)
4. Expand LIFO and FIFO.
5. What are push() and pop() operations.
6. What LIFO? List applications of it.
7. What are the drawbacks of ordinary queue?
8. What is priority queue? Mention different types of it.
9. Evaluate the following postfix expression 12-34-*
10. What is circular queue?

5/10 Marks

1. Write a C code to insert an element on stack.
2. Differentiate queue and double ended queue.
3. Write a C code to insert and delete an element from circular queue.
4. 14, Convert the following expressions into Postfix

    a. ((A*(B+C))/(D)-F

    b. (x+y)*(m/n+d)

5. What is queue? Explain different types of queues.
6. What is queue? Write basic concepts of it.
7. Explain working of a circular queue.
8. Explain application of stack in function call.
9. Write an algorithm to evaluation of postfix expression using stack.
10. What is stack? Explain various operations performed on stack with code.
11. Explain double ended queue.
12. Convert the given expression into postfix expression

    i. ((A#(B-C) *D) SE+F)

    ii. (a+(b*c) —d) / e

13. Write ac program to perform all operations on ordinary queue.
14. Write ac program to perform all operations on stack.
15. Write a note on Conversion of expressions using stack.

Note: Refer all DS Lab journal programs on this unit.

UNIT-IV

(Linked List, Trees, Binary Trees)

2 Marks

1. What is Linked list? Mention the operations on list.
2. What is singly linked list? How do you declare it.
3. What is Node? Classify linked list.
4. Differentiate singly linked list and doubly linked list.
5. Define Tree. Mention the basic operations ona Tree.
6. Define degree and depth of a tree.
7. What are terminal and non-terminal nodes?

8. What is binary search tree?
9. Define strict binary tree. Give examples.
10. Define complete binary tree.
11. What are siblings of a tree?
12. Define path of tree.

5/10 Marks

1. Explain the types of linked list.
2. Define a. Node, b. Terminal Node, c. non-terminal node.
3. Write an algorithm to display in-order traversal of a binary tree.
4. Define a. Heap tree b. Binary search tree c. Complete binary tree.
5. What is Tree?
6. Explain pre-order, post-order and in-order in tree.
7. Write an algorithm to display post-order traversal of a binary tree.
8. Write an algorithm to display pre-order traversal of a binary tree.

Note: Refer all DS Lab journal programs on this unit.