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4th Sem / Branch : Comp.

Subject:- Data Structures using C

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 What is a data structure?

a) A programming language
b) A collection of algorithms
c) A way to store and organize data
d) A type of computer hardware

Q.2 Array is a _____ data structure

a) Linear b) Non-Linear
c) Both d) None

Q.3 What are the disadvantages of arrays?

a) Index value of an array can be negative
b) Elements are sequentially accessed
c) Data structure like queue or stack cannot be implemented
d) There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size

Q.4 What is the information, which a Linked List's Node must store?

a) The address of next node if it exists
b) Value of current node
c) Both a and b
d) None of the above

Q.5 Which type of linked list stores the address of the head node in the nextpointer of the last node.

a) Singly Linked List b) doubly Linked List
c) Hashed List d) Circular Linked List

Q.6 Which one of the following is the process of inserting an element in the stack?

a) Insert b) Add
c) Push d) None of the above

Q.7 When a pop() operation is called on an empty queue, what is the condition called?

a) Overflow b) Underflow
c) syntax Error d) Garbage Value

Q.8 Which of the following data structure finds its use in recursion?

a) Stack b) Array
c) Linked List d) Queues

Q.9 Which of the following represents the Postorder Traversal of a Binary Tree?

a) Left->Right->Root b) Left->Root->Right
c) Right->Left->Root d) Right->Root->Left

Q.10 To represent hierarchical relationship between elements which data structure is suitable?

a) Deque b) Priority Queue
c) Tree d) Graph

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define a variable.

Q.12 Define array.

Q.13 Define Stack.

Q.14 Define Reverse polish Notation.

Q.15 Define Linked list.

Q.16 Variable that stores the address of another variable is known as _____.

Q.17 The end where an elements is inserted in queue is called _____.

Q.18 What is a Terminal node?

Q.19 Arranging the elements in an order is called _____.

Q.20 What is Binary tree?

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 What are the difference between Top Down and Bottom up approach.

Q.22 What are the different type of Data Structure? Explain.

Q.23 Discuss various operations performed on data structures.

Q.24 Explain the memory representation of 1-D and 2-D array.

Q.25 Write down the algorithm to insert an element into linear array.

Q.26 What is linked list? Discuss different type of linked lists.

Q.27 Discuss various applications of Linked Lists.

Q.28 What is the limitation of simple queue? How to overcome this problem?

Q.29 Write an algorithm to evaluate postfix notation with suitable example.

Q.30 Write a program in C to find the factorial of a number using recursion.

Q.31 What are the different traversal techniques? Explain with suitable example.

Q.32 Construct binary search tree of 30, 100, 90, 15, 2, 25, 36, 72, 78, 10. Show diagrammatically each step of construction of BST.

Q.33 Differentiate between Global and local variable.

Q.34 Describe the working of bubble sort technique of the list 19, 2, 27, 3, 7, 5, 31.

Q.35 Write down the difference between Stack and Queue.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Discuss Memory representation of array? Explain declaration and initialization of one and two dimensional array with example.

Q.37 List various Searching Techniques. Write the algorithm of any one.

Q.38 Convert the following infix expression to its postfix form using stack A+B$^{\cup}$C*(D/E)-F/G