

BCA
2ND SEMESTER
DATA STRUCTURES THROUGH C
BCA - 201

Duration: 3 Hrs.

Marks: 70

{ Part : A (Objective) = 20 }
{ Part : B (Descriptive) = 50 }

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins.

Marks: 50

[Answer question no. One (1) & any four (4) from the rest]

1. Define Stack with diagram. Explain push, pop and display functions. 4+6=10
2. Explain the different types of queues. Discuss the Delete operation for a normal queue. 7+3=10
3. Define Circular singly linked list with diagram. Explain the steps to insert a node at the rear end in a circular singly linked list. 5+5=10
4. Explain the tree traversal technique with algorithm, and example for each. Define Binary tree, Strictly Binary tree and Complete Binary tree. 6+4=10
5. What is Depth First and Breadth First traversal? Explain Kruskal's algorithm to find minimum spanning tree with suitable examples. 4+6=10
6. Explain the types of basic searching techniques. Write a 'C' program to search for an item using Binary Search. 5+5=10
7. Write a 'C' program to arrange the numbers in ascending order using Selection Sort technique. 10
8. Explain the following: 5+5=10
 - (c) Quick sort
 - (d) Doubly Linked List

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[PART-A : Objective]

Choose the correct answer from the following:

1×20=20

1. Stack is also called as:
 a. Last in first out b. First in last out
 c. Last in last out d. First in first out
2. Inserting an item into the stack when stack is not full is called _____ operation and deletion of items from the stack, when stack is non-empty is called _____ operation.
 a. pop, push b. push, pop
 c. insert, delete d. None of the above.
3. A _____ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.
 a. Queue linked list b. Stack linked list
 c. Both of them d. Neither of them.
4. Which of the following is a nonlinear data structure?
 a. Stacks b. Lists
 c. Strings d. Trees
5. A directed graph is _____ if there is a path from each vertex to every other vertex in the graph.
 a. Weakly connected b. Strongly connected
 c. Tightly connected d. Linearly connected
6. In the _____ traversal we process all of a vertex's descendants before we move to an adjacent vertex.
 a. Depth first b. Breadth first
 c. Width first d. Depth limited
7. In _____ search, start at the beginning of the list and check every element in the list.
 a. Linear search b. Binary search
 c. Hash search d. None of the above.
8. A data structure where elements can be added or removed at either end but not in the middle is called?
 a. Linked lists b. Stacks
 c. Queues d. Dequeues

9. When new data are to be inserted into a data structure, but there is no available space, this situation is usually called:
a. Underflow b. Overflow
c. Saturated d. None of the above.
10. Which of the following is not a type of queue?
a. Ordinary queue b. Single ended queue
c. Circular queue d. Priority queue
11. A graph is a collection of nodes, called _____ and line segments called arcs or _____ that connects pair of nodes.
a. vertices, edges b. edges, vertices
c. vertices, paths d. graph node, edges
12. In a circular queue, the value of r will be
a. $r = r + 1$ b. $r = (r + 1) \% [Queue_size - 1]$
c. $r = (r + 1) \% Queue_size$ d. $r = (r - 1) \% Queue_size$
13. In a queue, the initial values of front pointer 'f', rear pointer 'r' should be _____ and _____ respectively.
a. 0 and 1 b. 0 and -1
c. -1 and 0 d. 1 and 0
14. A _____ is a graph that has weights of costs associated with its edges.
a. network b. weighted graph
c. Both (a) and (b) d. Neither of them.
15. _____ is a directed tree in which outdegree of each node is less than or equal to two:
a. Unary tree b. Binary tree
c. Ternary tree d. Both (b) and (c)
16. The logical and mathematical model of a particular organization of data is called a _____.
a. Data structure b. Data arrangement
c. Data configuration d. Data formation
17. Each node in doubly linked list contains _____ parts
a. 2 b. 3 c. 1 d. None of the above.
18. If we choose Prim's algorithm instead of Kruskal's algorithm to find the minimum weighted spanning tree, then:
a. we will get a different spanning tree
b. we will get the same spanning tree
c. spanning tree will have less edges
d. None of the above.

19. In doubly linked lists:

- a. A pointer is maintained to store both next and previous nodes.
- b. Two pointers are maintained to store next and previous nodes.
- c. A pointer to self is maintained for each node.
- d. None of the above.

20. Visiting root node after visiting left and right sub-tree is called:

- a. In-order traversal
- b. Pre-order traversal
- c. Post-order traversal
- d. None of the above.

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA



Question Paper CUM Answer Sheet

[PART (A) : OBJECTIVE]

Serial no. of the main
Answer sheet

Course :

Semester : Roll No :

Enrollment No : Course code :

Course Title :

Session : 2016-17 Date :

Instructions / Guidelines

- The paper contains twenty (20) / ten (10) questions.
- The student shall write the answer in the box where it is provided.
- The student shall not overwrite / erase any answer and no mark shall be given for such act.
- Hand over the question paper cum answer sheet (Objective) within the allotted time (20 minutes / 10 minutes) to the invigilator.

Full Marks	Marks Obtained	Remarks
20		

Scrutinizer's Signature

Examiner's Signature

Invigilator's Signature