



**D.Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**  
**KASABA BAWADA KOLHAPUR-416006**

(An Autonomous Institute)  
**S. Y. B. Tech-CSE (Semester-III)**

**END SEMESTER EXAMINATION, OCT./NOV.- 2021-22**  
COURSE NAME: Data Structures COURSE CODE: 201CSL204

Q. Paper Code:

**22SYCSE204304**

**Day and Date: Monday, 24/01/2022**  
**Time:10.00 am to 11.00 am**

Seat No :

**Max. Marks- 50**

**OBJECTIVE**

|        |  | Correct Option |
|--------|--|----------------|
| Q. 1)  | Type of non-primitive linear data structures   | <div>D</div>   |
|        | A) Stack, tree   |                |
|        | B) linked list, float  |                |
| Q. 2)  | C) graph, queue  | <div>B</div>   |
|        | D) array, stack  |                |
|        | Which of the following sorting algorithms provide the best time complexity in the worst-case scenario?   |                |
| Q.3)   | A) Quick Sort  | <div>C</div>   |
|        | B) Merge Sort  |                |
|        | C) Selection Sort  |                |
| Q.4)   | D) Bubble sort   | <div>B</div>   |
|        | An ..... is a process and set of rules required to perform calculations or some other problem-solving operations by computer.  |                |
|        | A) Data structures   |                |
| Q. 5)  | B) Flow chart  | <div>D</div>   |
|        | C) Algorithm   |                |
|        | D) None of the above   |                |
| Q. 6)  | Which notation is used to represent worst case complexity?   | <div>D</div>   |
|        | A) Big Omega   |                |
|        | B) Big Oh  |                |
| Q. 7)  | C) Big Theta   | <div>D</div>   |
|        | D) Small Omega   |                |
|        | What is the output of following function for start pointing to first node of following linked list?<br>1->2->3->4->5->6<br>void fun(struct node* start)<br>{<br>if(start == NULL)<br>return;<br>printf("%d ", start->data);<br><br>if(start->next != NULL )<br>fun(start->next->next);<br>printf("%d ", start->data);<br>} |                |
| Q. 8)  | A) 1 4 6 6 4 1   | <div>D</div>   |
|        | B) 1 3 5 1 3 5   |                |
|        | C) 1 2 3 5   |                |
| Q. 9)  | D) 1 3 5 5 3 1   | <div>D</div>   |
|        | Which of the following points is/are true about Linked List data structure when it is compared with array  |                |
|        | A) The size of array has to be pre-decided, linked lists can change their size any time.   |                |
| Q. 10) | B) It is easy to insert and delete elements in Linked List   | <div>D</div>   |
|        | C) Random access is not allowed in a typical implementation of Linked Lists  |                |
|        | D) All of the above  |                |
| Q. 11) | What is the value of the postfix expression 6 3 2 4 + - *?   | <div>D</div>   |
|        | A) 1   |                |
|        | B) 40  |                |

|        |  |   |   |
|--------|--|---|---|
|        | C) 74  | D) -18  |   |
| Q. 8)  | Which one of the following is an application of Stack Data Structure?  |   | D |
|        | A) Managing function calls   | B) The stock span problem   |   |
|        | C) Arithmetic expression evaluation  | D) All of the above   |   |
| Q. 9)  | A single array A[1..MAXSIZE] is used to implement two stacks. The two stacks grow from opposite ends of the array. Variables top1 and top2 (top1 < top2) point to the location of the topmost element in each of the stacks. If the space is to be used efficiently, the condition for "stack full" is               |   | D |
|        | A) (top1 = MAXSIZE/2) and (top2 = MAXSIZE/2+1)   | B) top1 + top2 = MAXSIZE  |   |
|        | C) (top1 = MAXSIZE/2) or (top2 = MAXSIZE)  | D) top1 = top2 - 1  |   |
| Q. 10) | Suppose a circular queue of capacity (n - 1) elements is implemented with an array of n elements. Assume that the insertion and deletion operation are carried out using REAR and FRONT as array index variables, respectively. Initially, REAR = FRONT = 0. The conditions to detect queue full and queue empty are |   | A |
|        | A) Full: (REAR+1) mod n == FRONT, empty: REAR == FRONT   | B) Full: (REAR+1) mod n == FRONT, empty: (FRONT+1) mod n == REAR  |   |
|        | C) Full: REAR == FRONT, empty: (REAR+1) mod n == FRONT   | D) Full: (FRONT+1) mod n == REAR, empty: REAR == FRONT  |   |
| Q. 11) | Which of the following is true   |   | A |
|        | A) The AVL trees are more balanced compared to Red Black Trees, but they may cause more rotations during insertion and deletion.   | B) Heights of AVL and Red-Black trees are generally same, but AVL Trees may cause more rotations during insertion and deletion.       |   |
|        | C) Red Black trees are more balanced compared to AVL Trees, but may cause more rotations during insertion and deletion.  | D) Heights of AVL and Red-Black trees are generally same, but Red Black trees may cause more rotations during insertion and deletion. |   |
| Q.12)  | Consider a B+-tree in which the maximum number of keys in a node is 5. What is the minimum number of keys in any non-root node?  |   | B |
|        | A) 1   | B) 2  |   |
|        | C) 3   | D) 4  |   |
| Q. 13) | Given an undirected graph G with V vertices and E edges, the sum of the degrees of all vertices is   |   | B |
|        | A) E   | B) 2E   |   |
|        | C) V   | D) 2V   |   |
| Q. 14) | What is the maximum number of edges in an acyclic undirected graph with n vertices?  |   | A |
|        | A) n-1   | B) n  |   |
|        | C) n+1   | D) 2n-1   |   |
| Q. 15) | Which of the following data structure is useful in traversing a given graph by breadth first search?   |   | C |
|        | A) Stack   | B) List   |   |
|        | C) Queue   | D) None of the above.   |   |
| Q. 16) | Let G be a weighted undirected graph and e be an edge with maximum weight in G. Suppose there is a minimum weight spanning tree in G containing the edge e. Which of the following statements is always TRUE?  |   | A |
|        | A) There exists a cut set in G having all edges of maximum weight.   | B) There exists a cycle in G having all edges of maximum weight   |   |
|        | C) Edge e cannot be contained in a cycle.  | D) All edges in G have the same weight  |   |
| Q. 17) | What is output of selection sort after completion of second pass?<br>23, 54, 36, 69, 94, 45, 30  |   | B |
|        | A) 23, 54, 36, 69, 30, 45, 94  | B) 23, 36, 54, 69, 94, 45, 30   |   |

|        |  |   |   |
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|        | C) 23, 36, 54, 69, 45, 30, 94  | D) 23, 36, 54, 45, 69, 30, 94   |   |
| Q. 18) | Which of the Data structure has the property where the key value of root node is greater or equal to the key value of any of its child nodes?  |   | D |
|        | A) Binary Search Tree  | B) AVL Tree   |   |
|        | C)Min Heap   | D)Max Heap  |   |
| Q. 19) | In delete operation of BST, we need in order successor (or predecessor) of a node when the node to be deleted has both left and right child as non-empty. Which of the following is true about in order successor needed in delete operation?  |   | B |
|        | A) In order successor is always either a root node or a node with empty left child   | B) In order successor is always either a leaf node or a node with empty left child  |   |
|        | C) In order successor may be an ancestor of the node   | D) In order successor is always either a leaf node or a node with empty right child |   |
| Q. 20) | A Priority-Queue is implemented as a Max-Heap. Initially, it has 5 elements. The level-order traversal of the heap is given below: 10, 8, 5, 3, 2 Two new elements "1" and "7" are inserted in the heap in that order. The level-order traversal of the heap after the insertion of the elements is:   |   | D |
|        | A) 10, 8, 7, 5, 3, 2, 1  | B) 10, 8, 7, 2, 3, 1, 5   |   |
|        | C) 10, 8, 7, 1, 2, 3, 5  | D) 10, 8, 7, 3, 2, 1, 5   |   |
| Q.21)  | Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?  |   | C |
|        | A) 7 5 1 0 3 2 4 6 8 9   | B) 0 2 4 3 1 6 5 9 8 7  |   |
|        | C) 0 1 2 3 4 5 6 7 8 9   | D) 9 8 6 4 2 3 0 1 5 7  |   |
| Q. 22) | In queue data structure deletion takes place at .....  |   | B |
|        | A) rear end  | B) front end  |   |
|        | C) top end   | D) middle end   |   |
| Q. 23) | What is the search complexity in direct addressing?  |   | D |
|        | A) O(n)  | B) O (n log n)  |   |
|        | C) O(logn)   | D) O (1)  |   |
| Q. 24) | Given the following input (4322, 1334, 1471, 9679, 1989, 6171, 6173, 4199) and the hash function $x \bmod 10$ , which of the following statements are true?<br>i. 9679, 1989, 4199 hash to the same value<br>ii. 1471, 6171 hash to the same value<br>iii. All elements hash to the same value<br>iv. Each element hashes to a different value           |   | C |
|        | A) i only  | B) ii only  |   |
|        | C) i and ii only   | D) iii and iv only  |   |
| Q. 25) | Which of the following is true/false about the traversal of Expression Tree<br>i. The Preorder traversal of Expression Tree gives Prefix notation of the Expression<br>ii. The Post order traversal of Expression Tree gives Postfix notation of the Expression<br>iii. The In-order traversal of Expression Tree gives Infix notation of the Expression |   | A |
|        | A) i. True, ii. True, iii. True  | B) i. True, ii. False, iii. True  |   |
|        | C) i. True, ii. False, iii. False  | D) i. False, ii. False, iii. False  |   |

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