Reg. No. : | | | | | | | | | | |

Question Paper Code: 33202

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Computer Science and Engineering

01UCS302 - DATA STRUCTURES

(Regulation 2013)

Duration: One hour Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Which of the following operations is performed more efficiently by doubly linked list than by singly linked list?

   (a) Deleting a node whose location in given
   (b) Searching of an unsorted list for a given item
   (c) Inverting a node after the node with given location
   (d) Traversing a list to process each node

2. The data structure required to check whether an expression contains balanced parenthesis is

   (a) stack (b) queue (c) tree (d) array

3. The prefix form of an infix expression a + b − c * d is

   (a) + ab − *cd (b) − +abc * d (c) − +ab * cd (d) − + * abcd

4. The post order traversal of a binary tree is DEBFCA. Find out the pre order traversal

   (a) ABFCDE (b) ADBFEC (c) ABDECF (d) ABDCEF

5. Which amongst the following cannot be a balance factor of any node of an AVL tree?

   (a) 1 (b) 2 (c) 0 (d) -1

6. In a heap, element with the greatest key is always in the _____ node.

(a) Leaf (b) Root
(c) First node of left sub tree (d) First node of right sub tree

7. If unions are done by size, if a node is initially at depth 0, the depth of any node is never more than

(a) n-1 (b) log n (c) n (d) n/2

8. A union find data-structure is commonly applied while implementing

(a) A depth-first search traversal of a graph
(b) A breadth-first search traversal of a graph
(c) Computing the minimum spanning tree of a graph using the Kruskal algorithm
(d) Computing the all-pairs shortest path in a graph

9. To implement Dijkstra's shortest path algorithm on un-weighted graphs so that it runs in linear time, the data structure to be used is

(a) Queue (b) Stack (c) Heap (d) B-Tree

10. In a graph if e=[u, v], Then u and v are called

(a) endpoints of e (b) adjacent nodes (c) neighbors (d) all the above

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Implement an algorithm to polynomials represented as single linked list. (8)

12. What is a BST? Explain with suitable algorithms for insertion and deletion of nodes at different instances. Illustrate with suitable examples. (8)

13. Explain the following routines in AVL tree with example: (i) Insertion (ii) Deletion (iii) Single rotation (iv) Double Rotation. (8)

14. Explain in detail the path compression techniques. (8)

15. Explain the Dijkstra's algorithm to shortest path with suitable example. (8)