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

Question Paper Code: 43202

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

Third Semester

Computer Science and Engineering

14UCS302 - DATA STRUCTURES

(Regulation 2014)

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. Explain the Linked implementation of stack and queue. How will you represent a Polynomial using an array? (8)

12. List the different types of tree traversal. Develop an algorithm for traversing a Binary tree. Validate the algorithm with a suitable example. (8)

13. Briefly explain the single and double rotation of AVL tree with examples. (8)

14. Given the following keys {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function $h(X) = X$ (mod10), construct.

(i) separate chaining table

(ii) an Open addressing hash table using linear probing

(iii) an Open addressing hash table using quadratic probing

(iv) an Open addressing hash table with second hash function $h2(X) = 7-(X \bmod 7)$. (8)

15. Explain Euler circuit with suitable example. (8)