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

Question Paper Code : 51375

B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Third Semester

Computer Science and Engineering

CS 2201/CS 33/080230007/10144 CS 302 – DATA STRUCTURES

(Regulations 2008/2010)

(Common to PT CS 2201/10144 CS 302 – Data Structures for B.E. (Part-Time) Second Semester CSE – Regulations 2009/2010)

Time : Three Hours **Maximum : 100 Marks**

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Define Abstract Data Type (ADT) ?
2. What are the applications of lists ?
3. Can you define tree in terms of Graph ? Comment.
4. Give an example for expression tree.
5. What do you mean by splay tree ?
6. Define binary heap.
7. How does the division remainder method help in hashing method ?
8. What is path compression ?
9. How do you represent a graph using linked list ? Give example.
10. What is bi-connectivity ?

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Explain the basic operations of linked list. **(10)**

(ii) Describe how to insert an element in circular linked list. **(6)**

OR

(b) (i) Write the procedure for stack operations. **(8)**

(ii) Explain how to delete an element in a circular queue. **(8)**

12. (a) (i) Write the procedure for binary tree traversals. **(10)**

(ii) Highlight the applications of trees. **(6)**

OR

(b) (i) Explain how to implement binary search tree. **(10)**

(ii) What is threaded binary tree ? Explain its use. **(6)**

13. (a) What is AVL tree ? Discuss the procedure for insertion and deletion operations of an AVL tree. Illustrate with examples. **(16)**

OR

(b) (i) Explain how to insert an element in B-tree with an example. **(10)**

(ii) Enumerate the applications of binary heaps. **(6)**

14. (a) Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function $h(x) = x \pmod{10}$. Show the resulting

(a) Open hash table

(b) Closed hash table using linear probing

(c) Closed hash table using quadratic probing

OR

(b) (i) Explain smart union algorithm. **(8)**

(ii) What is disjoint set ? Explain its significance. **(8)**

15. (a) (i) With an example, explain the topological sort algorithm. **(10)**

(ii) Compare breadth-first traversal with depth-first traversal. **(6)**

OR

(b) (i) Explain the use of Kruskal's algorithm with an illustrative example. **(10)**

(ii) Write an algorithm to find the shortest path in a graph. **(6)**
