Reg. No. :

Question Paper Code: 31082

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2015.

Third Semester

Information Technology

01UIT302 – PROGRAMMING WITH 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. Abstract data type is defined as

    (a) Set of operations   (b) Mathematical abstractions

    (c) Extension of modular design   (d) All of the above

2. A mathematical-model with a collection of operations defined on that model is called

    (a) Data structure   (b) Abstract data type
    (c) Primitive data type   (d) Algorithm

3. The number of paths from a root to a node in a tree

    (a) At least one (b) Exactly one   (c) More than one   (d) Cannot be determined

4. A full binary tree with 2n+1 nodes contain

    (a) n leaf nodes   (b) n non-leaf nodes
       (c) n-1 leaf nodes   (d) n-1 non-leaf nodes

5. In an AVL tree the height of the left sub-tree and right sub-tree at each node differ by

    (a) At most one   (b) Exactly one   (c) At least one (d) Cannot be determined

6. An element with the greatest key of heap is always consider as

    (a) leaf   (b) root
    (c) first node of left sub tree   (d) first node of right sub tree

7. Which of these hashing techniques is dynamic?

    (a) Open hashing   (b) Closed hashing
    (c) Extendible hashing   (d) Rehashing

8. The goal of hashing is to produce a search that takes

    (a) $O(1)$ time   (b) $O(n2)$ time   (c) $O(\log n)$ time   (d) $O(n \log n)$ time

9. Spanning in minimal spanning tree means

    (a) Covering every node   (b) Covering both node and edges
    (c) Covering every edge   (d) None of these

10. An adjacency matrix representation of a graph cannot contain information of

    (a) nodes   (b) edges
    (c) direction of edges   (d) parallel edges

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Explain the implementation of doubly linked list with suitable routines and discuss how it simplifies deletion when compared to singly linked list. (8)

12. For the tree given below (8)
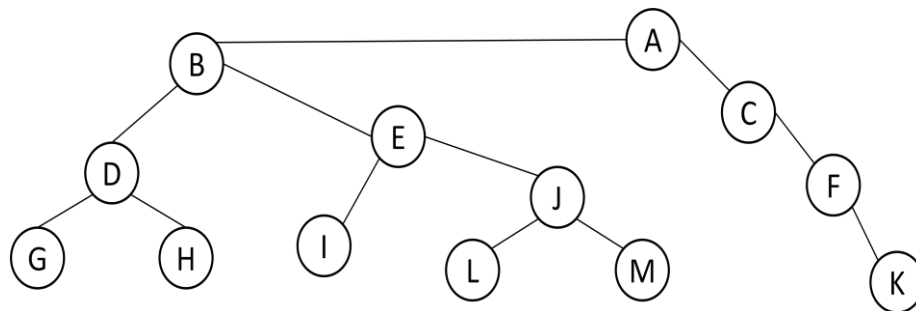
    a. Which node is the root?
    b. Which nodes are leaves?
    c. Compute the depth of node *L*.
    d. Compute the height of node *F*.
    e. What is the depth of the tree?
    f. Write the path from node *A* to node *M*.

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13. Explain the single rotation and double rotation of AVL tree in detail with suitable examples. (8)

14. What is the disadvantage of open hashing? Explain an alternative technique to resolve collisions in hashing. (8)

15. Explain the following:

(i) Topological sort (8)