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**Question Paper Code : 27298**

**5 Years M.Sc. DEGREE EXAMINATION, MAY/JUNE 2016**

**Third Semester**

**Software Engineering**

**ESE 031 – DATA STRUCTURES**

**(Common to 5 Years M.Sc. Software System)**

**(Regulations 2010)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. What is mean by data structures, storage structures and file structures ?
2. Write an algorithm by inserting pointer in the stack operation.
3. Write a pseudocode to delete the last element in a singly linked list.
4. Define : Circularly Linear Linked List.
5. Draw the tree for the following specifications. Preorder :  $*+AH+CD$ , Postorder :  $AB + CD+*$ .
6. What is a complete binary tree ? Give an example.
7. Distinguish between a graph and tree.
8. A graph can be represented as a matrix or as a multilist. Which of it is advantageous ? Why ?
9. How does the buddy system allocate space to a requesting process ?
10. What are the advantages of using an indexed sequential file ?

**PART – B (5 × 16 = 80 Marks)**

11. (a) Explain the concept of structures and arrays of structures with a suitable example for each of it. **(16)**

**OR**

- (b) Evaluate the postfix expression using a stack :  $6523 + 8* + 3 + *$ . **(16)**

12. (a) (i) Write the Procedure for insertion and deletion operations on a circular queue with an example. **(12)**

- (ii) What are priority queues ? Give one application that uses it. **(4)**

**OR**

- (b) (i) Write the general algorithm to copy a linked linear list and deleting a node from a linked list. **(8)**

- (ii) Formulate an algorithm to append a linear linked list to another linear list. **(8)**

13. (a) Explain the role of a tree in the construction of a symbol table.

**OR**

- (b) Write an algorithm to perform insertion and deletion on a binary search tree that is represented as a linked list.

14. (a) Suppose a binary tree T is in memory. Write a non-recursive procedure for each of the following :

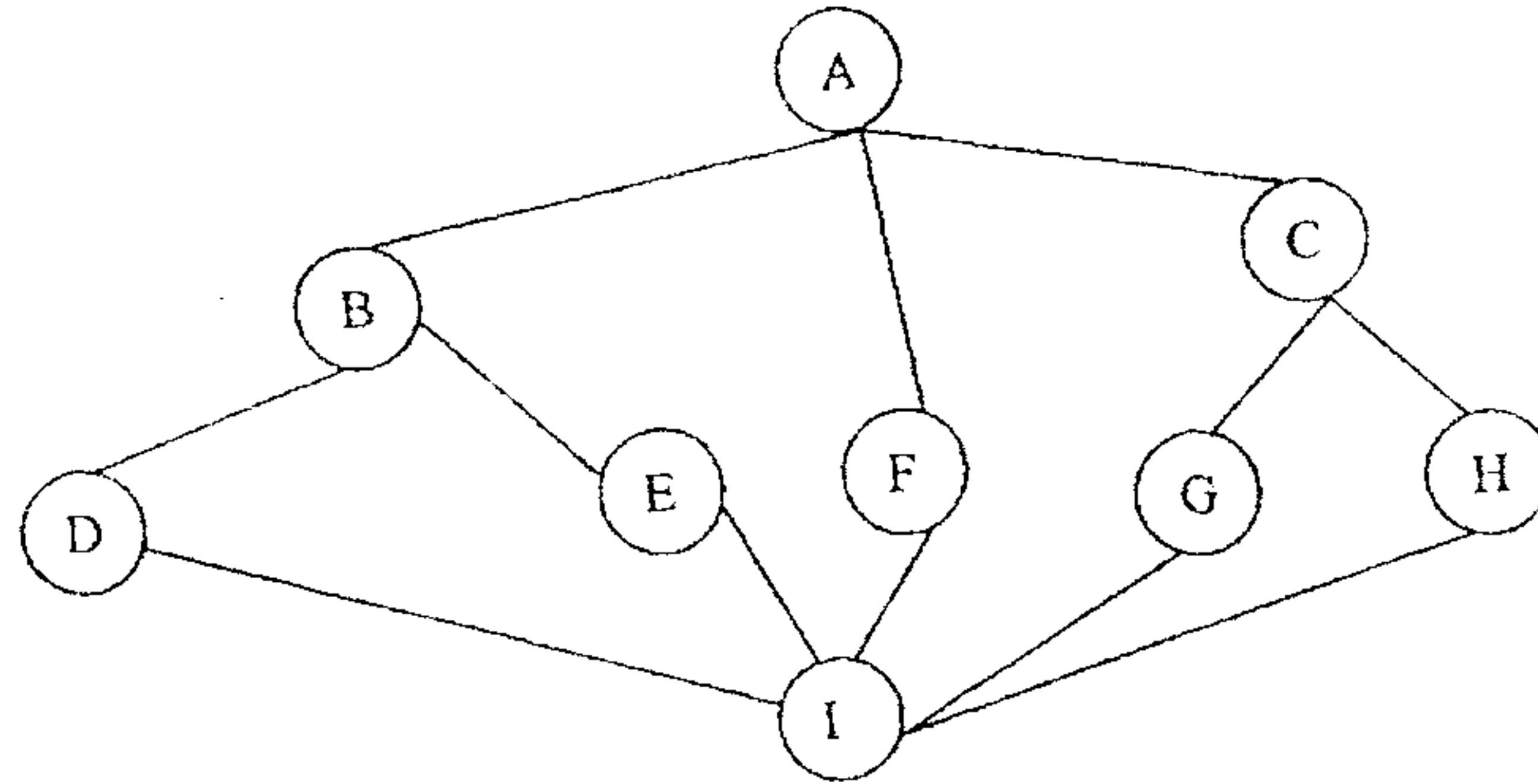
- (i) Finding the number of nodes in T.

- (ii) Finding the depth D of T.

- (iii) Finding the number of terminal nodes in T.

**OR**

- (b) Write the algorithms for Graph traversal. Trace the algorithms for the graph in Fig. 2. (Start from Vertex C)



**Fig. 2.**

15. (a) (i) How main and internal memory of the computer is organised ? Explain in the detail.
- (ii) What are the properties and algorithm used under the direct files ? Write algorithm with its Insert and Retrieve Operations.

**OR**

- (b) (i) Illustrate about the following terms : (1) SCOPE, (2) Track index and prime area of an Indexed sequential file in detail.
- (ii) Write a procedure for Track/Record address and properties with its six steps in detail.