

Paper ID [CS207]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 3rd)

DATA STRUCTURES AND PROGRAMMING METHODOLOGY **(CS - 207)**

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1) (10 x 2 = 20)

- a) Define recursion. Which data structure is used to implement recursion?
- b) Distinguish between BFS and DFS.
- c) Define header link list. What is its advantage?
- d) Discuss the sequential memory representation of binary trees.
- e) What are priority queues? How they are implemented?
- f) Write down the advantages and limitations of arrays.
- g) What are variable length records.
- h) Define a set. Discuss basic operations on set.
- i) What are complete graph. Write any two applications of complete graph.
- j) What is a queue. Discuss operations on queue.

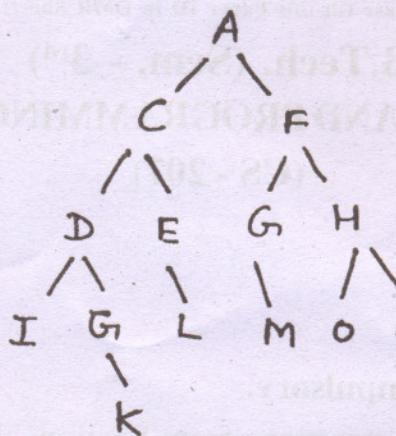
Section - B

(4 x 5 = 20)

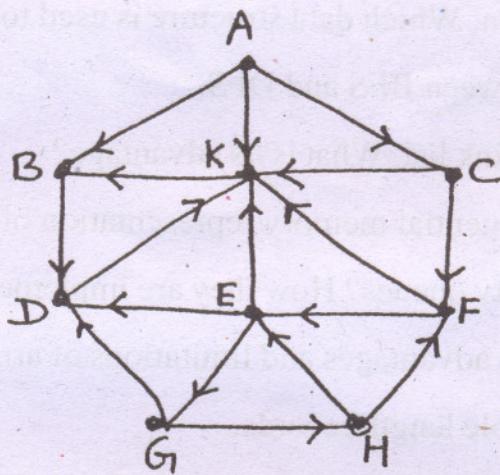
Q2) Compare stacks and queues and discuss their limitations.

Q3) Define data structure graph. How they are represented in memory.

- Q4)** For the following binary tree write the, preorder inorder and postorder traversals.



- Q5)** Apply Depth First Search (DFS) to following algo.



- Q6)** What is a heap? How does it differ from a binary tree? Brief out various operations on a heap.

Section - C

(2 x 10 = 20)

- Q7)** Explain the various collision resolution techniques used for hashing with example.

Q8) (a) Draw binary tree for expression.

$E = (2a + b)(5x - y)^3$ and find out the inorder, preorder and postorder traversals.

(b) Write an algorithm to sort a linear link list in descending order.

Q9) (a) Convert the following infix expression to postfix.

A + (B * C - (D/E ↑ F) * G) * H

(b) What is recursion? Write a program to invert string using recursion.eg ANITA to ATINA.