2504E150   Candidate's Seat No :_____

MSc AIML (NEP) Semester-2 Examination
DSC-C-AIML-121 (T)
Algorithams & Data Structure

Time : 2-00 Hours]   April-2024   [Max. Marks : 50

Instructions: All questions are compulsory. Use of non-programmable scientific calculator is allowed.

Q.1 **(a)** Discuss binary number system developed by Acharya Pingla.   (05)
(b) Explain meru-prastar in brief.   (05)
OR
(a) Discuss Bhaskracharya Lilavati decimal system.   (05)
(b) Explain place value number system. How it is better than signed value number system.   (05)

Q.2 **(a)** What is stack? Write an algorithm / program to implement stack using an array.   (05)
(b) What is Link-List? How it differs from an array? List and explain different types of it.   (05)
OR
(a) Write an algorithm / program to perform quick sort.   (05)
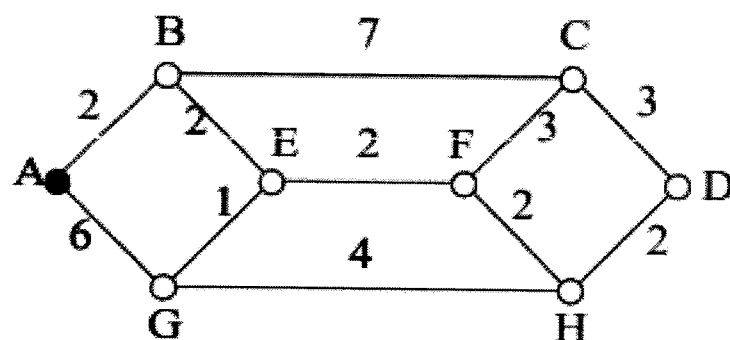**(b)** Convert the following given Infix expression to Postfix.   (05)

$$K + L - M * N + (O \wedge P) * W / U / V * T + Q$$

Q.3 **(a)** What is Queue? List and explain different types of Queues you know.   (05)
(b) Write an algorithm / program to implement circular queue.   (05)
OR
(a) What is File? Discuss different file organization in brief.   (05)
(b) Write a short note on: Dictionary.   (05)

Q.4 **(a)** What is Graph? Discuss traversal methods of graph.   (05)
(b) Find a shortest path from vertex A to D using Dijkstra's algorithm.   (05)

OR
(a) Insert the following values in the AVL-Tree.   (05)

21, 26, 30, 9, 4, 14, 28, 18, 15, 10, 2, 3, 7

(b) What is BST? Discuss different traversal method of BST with an example.   (05)

Q.5 Attempt any **TEN** out of **TWELVE:** (Each carries 01 mark)　　　　　　**(10)**

   (1)　Best case complexity of an Linear Search algorithm is _____.

   (2)　Complexity of a bubble sort algorithm is _____.

   (3)　_____ data structure implements FIFO ordering.

   (4)　A link-list in which address of the first node is stored in the next part of the last node, is known as _____ link-list.

   (5)　_____ data structure is used in Breadth First Search algorithm.

   (6)　Evaluation of postfix expression: 2 3 4 * + 8 2 1 + % - will be _____.

   (7)　Visit sequence for Post-order traversal of BST is _____.

   (8)　_____ algorithm is used to find shortest path problem.

   (9)　To convert a graph into MST, _____ and _____ algorithms are used.

  (10)　_____ sorting algorithm is based on divide and conquer method.

  (11)　Backtracking can be done using _____ data structure.

  (12)　Simulation is an application of _____ data structure.

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