RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SECOND SEMESTER EXAMINATION, JUNE 2022

FIRST YEAR (BATCH 2021-24)

Date   : 20/06/2022   **COMPUTER SCIENCE (HONOURS)**

Time   : 11.00 am – 1.00 pm   **Paper : III [CC3]**   Full Marks : 50

Answer **any five** questions of the following: [5×10]

1. a) Define Data Structure. What is Abstract Data type?   [3+2]

    b) Write an algorithm to implement stack using array.   [5]

2. a) Construct a Binary Search Tree with the following data : 72,87,56,60,70,80,75,85.

    b) Construct a B-tree of order-3 with the following data : - 7,6,4,8,2,5,3,1.   [5+5]

3. a) Write an algorithm to implement Queue using circular linked list.

    b)   Write down a recursive algorithm of Binary Search.   [6+4]

4. a) Write an algorithm to reverse a circular linked list.

    b) Derive the non-recursive Merge Sort algorithm.   [4+6]

5. a) Prove that, e = i +2n where e = external path length, i = internal path length and n = number of internal nodes.

    b) Define Skewed Binary Tree and Complete Binary Tree.   [5+(3+2)]

6. a) Convert $A^{\wedge}B*C-D/E/F(G+H)$ in prefix and postfix expression.

    b) Evaluate the following postfix expression : - $6,2,3,+,-,3,8,2,/,+,*,2,^{\wedge},3,+$ [6+4]

7. a) Write short notes on Priority Queue.

    b) Explain different Hash function with example.   [5+5]

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