70-p3-d-upq-FH KL12 B

Con. 3889-12.

GN–5300

(3 Hours)

[Total Marks : 100

N.B. :(1) Question No. **1** is **compulsory**.
    (2) Attempt any **four** questions from Q. No. **2** to **7**.
    (3) Assume **suitable** data wherever required but justify the **same**.

1. (a) What is Recursion ? Write a program to calculate factorial of a number using   10
     recursion.
  (b) Explain linear and non-linear data structure with example.   5
  (c) Write ADT for stack. Give application of Stack.   5

2. (a) Write a program to implement Insertion sort using Java. Show passes of Insertion   10
     sort for following input data : 5, 3, 2, 1, 4.
  (b) Give different searching techniques. Write a program to implement Binary Search.   10

3. (a) Write a program in Java to copy content of a file to another file.   10
  (b) Write a program in Java to sort n integer numbers using Quicksort. Show the   10
     steps to sort the given numbers :
        25, 10, 7, 30, 15, 2, 96, 14.

4. (a) Explain different representation of graph. State advantages and disadvantages   10
     of each representation.
  (b) What is the use of Huffman Encoding ? Apply and give Huffman code for each   10
     symbol in sentence "DATA STRUCTURE".

5. (a) Write a Java program to implement circular queue using array.   10
  (b) Write a Java program to create a binary search tree. Show BST for following   10
     input : 10, 5, 4, 12, 15, 11, 3.

6. (a) What is the use of hashing ? Show hash table entries for the given dataset   10
     using Linear probing and quadratic probing : 12, 45, 67, 88, 27, 78, 20,
     62, 36, 55.
  (b) What are the advantages of Linked List over array ? Write a program in Java   10
     to implement stack using linked list.

7. Write short note on (any **two**) :—   20
    (a) Tree traversal algorithm
    (b) Graph traversal algorithm
    (c) Priority queue.