No. of Printed Pages : 4

OIEL-002

DIPLOMA – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI) / ADVANCED LEVEL CERTIFICATE COURSE IN ELECTRONICS AND COMMUNICATION ENGINEERING (ACECVI)

00489

Term-End Examination

December, 2017

OIEL-002 : DATA STRUCTURES

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. Question no.* ***1*** *is* ***compulsory****. Use of scientific calculator is allowed.*

1. (a) The postfix form of the expression *7×2=14*

(A + B) * (C * D – E) * F/G is

(i) AB + CD * E – FG/**

(ii) AB + CD * E – F ** G

(iii) AB + CD * E * F * G

(iv) AB + CDE * – * F * G

(b) Which of the following data structures is a linear data structure ?

(i) Trees

(ii) Graphs

(iii) Arrays

(iv) None of the above

(c) Arrays are the best data structures

(i) for relative permanent collection of data

(ii) for the size of the structure and the data in the structure are constantly changing

(iii) for both of the above situations

(iv) for none of the above situations

(d) The memory address of the first element of an array is called

(i) Floor address

(ii) Foundation address

(iii) First address

(iv) Base address

(e) The best average behaviour is shown by

(i) Quick Sort

(ii) Merge Sort

(iii) Insertion Sort

(iv) Heap Sort

(f) A full binary tree with n leaves contains

(i) n-nodes

(ii) $\log_2 n$ nodes

(iii) $2n - 1$ nodes

(iv) 2^n nodes

(g) Stack is also called as

(i) LIFO

(ii) FIFO

(iii) LILO

(iv) FILO

2. (a) Explain the representation of 2-D array in the memory. Also, write down the various applications of an array. 7

(b) What is the difference between a structure and a union ? Explain with suitable example. 7

3. (a) What is Sorting ? List the sorting techniques and explain any one of them with an algorithm. 7

(b) Write a C program to create an empty stack and to push an element into it. 7

4. (a) Write a procedure to create, insert and delete an element in queue. 7

(b) Define Algorithm. Write down the main features of an efficient algorithm. 7

5. Compare Singly linked list, Doubly linked list and Circular linked list with suitable examples. *14*

6. (a) Define Graph. Explain Directed graph, Undirected graph and Connected graph with examples. *7*

   (b) What are the types of traversals of a binary tree ? Explain any two of them. *7*

7. Write short notes on any ***two*** of the following : *2×7=14*

   (a) Sequential and Random Access Files

   (b) Sequential Searching

   (c) Concept of Priority Queue

   (d) Breadth First Search Algorithm for Minimal Spanning Tree