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OICS-001

DIPLOMA – VIEP – COMPUTER SCIENCE AND ENGINEERING (DCSVI) / ADVANCED LEVEL CERTIFICATE COURSE IN COMPUTER SCIENCE AND ENGINEERING (ACCSVI)

Term-End Examination

00770 **December, 2017**

OICS-001 : DATA STRUCTURES AND FILES

Time : 2 hours *Maximum Marks : 70*

Note : *Question no. **1** is **compulsory**. Attempt any **four** questions from the remaining.*

1. Choose the correct answer from the given alternatives : *7×2=14*

(a) How many nodes in a tree have no ancestors ?

(i) 0

(ii) 1

(iii) 2

(iv) n

(b) The prefix form of an infix expression p + q – r * t is

(i) + pq – * rt

(ii) – + pqr * t

(iii) – + pq * rt

(iv) – + * pqrt

(c) One of the major drawbacks of a B-Tree is the difficulty of traversing the keys sequentially.

(i) True

(ii) False

(d) Which of the following sorting algorithms is stable ?

(i) Insertion sort

(ii) Bubble sort

(iii) Quick sort

(iv) Heap sort

(e) Representation of data structure in memory is known as

(i) Recursive

(ii) Abstract data type

(iii) Storage structure

(iv) File structure

(f) A B-tree of minimum degree t can have maximum _____ pointers in a node.

(i) $t - 1$

(ii) $2t - 1$

(iii) $2t$

(iv) t

(g) A technique for direct search is

(i) Binary search

(ii) Linear search

(iii) Tree search

(iv) Hashing

2. Explain the following with the help of suitable examples : *7+7*

(a) Call by value

(b) Call by reference

3. Discuss Kruskal's algorithm with an example. *14*

4. (a) Explain topological sort with an example. *7*

(b) Describe the process of finding the minimum and maximum elements of a binary search tree. *7*

5. Write about hashing and its function in detail. *14*

6. Explain the following with the help of suitable examples : *6+4+4*

(a) Recursion

(b) Structure

(c) Union

7. (a) Briefly explain the operations of a queue. 7

(b) Explain the types of arrays with the help of an example. 7

8. (a) Convert the following prefix expression to postfix expression using stack : 7

$$A * B + (C - D / E) \#$$

(b) Perform an insertion operation using the binary search tree for the following elements : 7

8, 5, 10, 15, 20, 18, 3