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B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)

Term-End Examination

June, 2018

00703

BICS-007 : DATA STRUCTURES

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any* ***five*** *questions. All questions carry equal marks.*

1. (a) Calculate the address of data [4, 3] in a two-dimensional array data [1 – 5, 1 – 4] stored in 7

(i) row major form,

(ii) column major form.

(b) What do you mean by linked list ? Write down the algorithm for insertion at the beginning of the singly linked list. 7

2. (a) Explain Multidimensional Arrays. Also explain row major order and column major order with formulae and specific examples. 7

(b) Convert the following Infix expression to Postfix form : 7

(i) A* (B + C) / D–G

(ii) 3* log (x + 1) – a/2

3. (a) Explain Insertion sort with example. Write the algorithm for insertion sort with the complexity. 7

(b) What are the different searching techniques ? Explain one of them with suitable example. 7

4. (a) Explain stack push and pop operations. Write down the algorithm for push and pop operations for a stack implemented using an array. 7

(b) Explain Sparse Matrix with example. What are the advantages of sparse matrix ? 7

5. (a) Store the following elements using heap sort : 7

10, 5, 8, 6, 11, 2, 19, 7

(b) What is hashing ? Explain each type of hash function with suitable example. 7

6. (a) Consider the 25 × 4 matrix array ABC. Suppose base (ABC) = 200 and there are W = 4 words per memory cell. Calculate the address of ABC [12, 3] using row-major order and column-major order. 7

(b) Create a binary tree if its Inorder and Postorder traversals are as under : 7

Inorder : C B D A F E

Postorder : C D B F E A

7. Explain any ***two*** of the following : *2×7=14*

(a) Spanning Trees

(b) Merge sort

(c) Generalized linked list

(d) Garbage collection