Code No. 7073

FACULTY OF SCIENCE

B.Sc. (CBCS) III – Semester Examination, November / December 2017

Subject : COMPUTER SCIENCE

Paper – III

Data Structures

Time : 3 hours Max. Marks : 80

Part – A (5 X 4 = 20 Marks)

(Short Answer Type)

Answer any Five of the following questions.

1. Write the advantages and disadvantages of arrays.
2. Explain the postfix expression evaluation with an example.
3. Differentiate between iteration and recursion approaches in problem solving.
4. Write a short notes on double-ended queue (DEQUE).
5. Briefly describe about the properties of a binary tree.
6. Describe the adjacency matrix and adjacency list graph representations with example.
7. Explain the sequential search algorithm with an example.
8. Define a heap. Build the heap tree for the list of data : 2,9,7,6,5,8.

Part – B (4 X 15 = 60 Marks)

(Essay Answer Type)

Answer ALL questions from the following :

9 a) i) Briefly describe about the various types of data structure.
ii) Define an algorithm. Write a flow chart and a pseudo-code to compute the sum of the first N natural numbers. 6+9

OR

b) i) What is a stack? Give the ADT for a stack.
ii) Reverse the string "ABCDEF" using stack. 7+8

10 a) Explain the queue operations with a program code and examples.

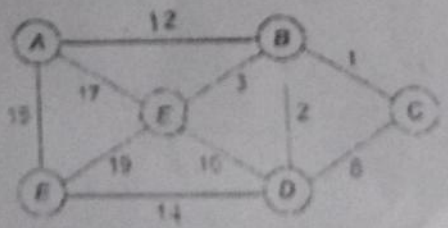
OR

b) Explain the operations of insertion of a node, deletion of node and traversal in linked list with examples. 6+6+3

11 a) Define binary search tree. Construct a binary search tree and explain the operations inserting a node, searching for a key, deleting a node with examples. 3+4+4+4

OR

b) Define the terms graph, tree, spanning tree, and minimum spanning tree. Construct a minimum spanning tree (step-by-step) from the following graph using prim's algorithm. 7+8



12 a) Write a program code for insertion sort algorithm. Show the stepwise execution of the algorithm for the following list of data : 76,67,36,55,23,14,6. 7+8

OR

b) Write an algorithm for quick sort. Show the stepwise execution of the algorithm for the following list of data : 25,57,48,37,12,92,86,33. 7+8

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