

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

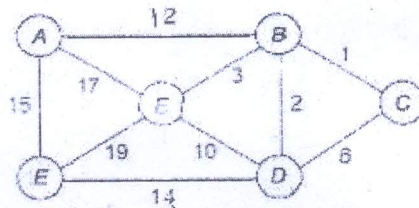
 - b) i) What is a stack? Give the ADT for a stack.
ii) Reverse the string "ABCDEF" using stack. 7+8
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- 10 a) Explain the queue operations with a program code and examples.

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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