46/2324

Roll No. .....

67056

MCA 2nd Semester CBCS Scheme w.e.f. 2016-17 Examination – May, 2018

DATA STRUCTURES USING C++

Paper : 16MCA32C1

Time : Three Hours] *[Maximum Marks : 80*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 which is ***compulsory***. Attempt ***four*** more questions selecting ***one*** question from each Unit.

1. Answer the following questions in briefly : $8 \times 2 = 16$

(a) Write characteristics of good algorithm.

(b) Explain advantages of hashing.

(c) Describe ***two*** advantages of recursive algorithms.

(d) What is B-trees ?

(e) Explain advantages of spanning trees.

(f) Describe complexity of bubble sort.

(g) Write the use and advantages of linked lists.

(h) Discuss advantages of converting infix notation to pre-fix notation.

UNIT – I

2. (a) Define structured programming ? How is it useful and used in C++ ? Discuss with examples. 8

(b) Discuss uses and advantages of top down approach to algorithm design with suitable examples. 8

3. Explain the following briefly with suitable examples :

(a) Time and space complexity of an algorithm 8

(b) Analysis of an algorithm 8

UNIT – II

4. (a) What is heap sort ? How is it useful and used ? Explain its complexity also with an example and C++ code segments. 8

   (b) Discuss applications of arrays with examples and C++ code segments. 8

5. Describe the following with examples :

   (a) Hashing techniques and their relative merits. 8

   (b) Binary search trees and their *Two* major applications. 8

UNIT – III

6. (a) What doubly linked list ? How is it useful and used ? Discuss with examples and C++ code segments. 8

   (b) Explain *three* major applications of stack through suitable examples and C++ code segments. 8

7. Explain the following with examples :

(a) Evaluation of postfix expression using stacks. 8

(b) Representation of queues using linked lists. 8

UNIT – IV

8. (a) What is AVL Tree ? How is it used and useful ? Explain it with suitable examples and C++ codes. 8

(b) Discuss minimal spanning tree algorithms with examples and C++ code segments. 8

9. Explain the following with examples :

(a) Threaded binary tree and its advantages. 8

(b) Comparison of Prim's and Kruskal's algorithms. 8