Roll No. ....

41257

B. Sc. Mathematics (Hons.) 4th Semester

Examination – May, 2019

DATA STRUCTURE USING C

Paper : BMH246 Opt - i

Time : Three hours]   [Maximum Marks : 60

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 is *compulsory*. Students are required to attempt *four* more questions by selecting *one* question from each Unit. All questions carry equal marks.

1. (i) Define different types of degree in tree.   6 × 2 = 12

   (ii) Explain the way to direct access the element in array.

   (iii) What do you mean by dequeue ?

   (iv) What is overflow in stack ? Give its significance.

   (v) Briefly explain the disadvantage of quick sort.

   (vi) What is complete graph ?

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UNIT – I

2. (i) What is queue ? Write a program in queue to insert and delete the element.   6

   (ii) What is stack ? Write an algorithm using stack for infix to postfix conversion of a mathematical expression.   6

3. (i) What is inverted list ? Explain it in detail with example.   6

   (ii) Write a program in C to create and display the elements of in doubly link list.   6

UNIT – II

4. (i) The inorder and preorder traversal of a binary tree are as given below :

   Inorder : $D \to B \to E \to A \to F \to C \to G$

   Preorder : $A \to B \to D \to E \to C \to F \to G$

   Create a tree using the above information.   6

   (ii) What is sparse array ? How it is different from array ? Elaborate the benefits of sparse array with examples.   6

5. (i) Write a program in C for multiplication of two matrices.   6

   (ii) What is do you understand by height balanced tree ? Create a height balanced tree considering the following list of elements : 3, 5, 11, 8. 4. 1, 12, 7, 2. 6, 10   6

<div align="center">(2)</div>

UNIT – III

6. What is graph ? Explain different type of graphs with diagram. Write the any one algorithm to traverse the graph.   12

7. What is B+ tree ? construct a B-tree using the following order of keys : 1 12 8 2 25 5 14 28 17 7 52 16 48 68 3 26 29 53 55 45 of order 4.   12

UNIT – IV

8. (i) What is shell sort ? Explain shell sort technique with the help of examples.   6

   (ii) What is time complexity ? Compare the time complexity of all sorting algorithm.   6

9. What is dividing and conquer method ? Explain different method of divide and conquer in sorting and searching.   12