24032

B. Tech. 3rd Semester (CS & IT)
Examination – December, 2018

DATA STRUCTURE USING 'C'

Paper : CSE-201-F

Time : Three Hours]   *[Maximum Marks : 100*

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 : Attempt *five* questions in all with at least *one* question from each Section. Question No. **1** is *compulsory.* All questions carry equal marks.

1. Answer the following :

   (a) Define Big-O Notation.   3

   (b) What is a priority queue ?   2

   (c) List three main applications of heap.   3

   (d) Explain dynamic allocation.   4

   (e) Differentiate between array and linked list.   4

   (f) Explain Polish Notation.   4

SECTION – A

2. (a) How do we design and develop an algorithm ? Also explain the time and space complexity of an algorithm. Illustrate with example. **12**

(b) What is a data structure ? How can we choose the right data structure ? **8**

3. (a) What is stack ? Describe the array representation of stack. Also discuss the applications of stack. **10**

(b) Write an algorithm to implement merge sort technique and also compute the complexity of algorithm. **10**

SECTION – B

4. Explain the following :

(a) Array of pointers and pointer to an array **9**

(b) Dynamic allocation **6**

(c) Pointer variable with suitable example **5**

5. What is linked list ? Explain in detail about doubly linked list and operations on doubly linked list with example. **20**

SECTION – C

6. What is binary tree ? Explain its types and operations performed on binary trees. Also discuss about threaded binary trees. **20**

7. (a) Write an algorithm for Depth First traversal of a graph. Explain with an example. **10**

(b) Explain the linked and matrix representation of graph. **10**

SECTION – D

8. (a) What do you mean by file organization ? What are different file access methods ? Illustrate. **10**

(b) What are sets ? What are list representations of sets ? Explain their importance. **10**

9. Explain the following :

(a) AVL Tree **10**

(b) Skip Lists **10**