Roll No. .....

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