Printed Pages: 02 **Sub Code: ECS302**

Paper ID: | 1 | 0 | 1 | 9 | **Roll No.** | | | | | | | | | | |

B TECH
(SEM. THIRD) THEORY EXAMINATION 2017-18
DATA STRUCTURE USING C

Time: 3Hours ***Max. Marks: 100***

Note: Attempt all Sections.

SECTION A

1. Attempt *all* questions in brief. 2 x10 = 20

a. What is deque? Give its advantages
b. How can we access individual elements of a string
c. Explain the use of calloc ( ) and realloc ( ) functions with example
d. Write an algorithm for insertion in circular queue
e. Explain single ended priority queue
f. What is a B tree?
g. What is the need for using circular array to implement queues
h. Discuss the timing analysis of the heap-sort algorithm.
i. What are the two broad classes of collision resolution techniques? Explain.
j. Define a binary tree.

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. Show the addition of given polynomials using linked list:
P=3X^2+2X+7
Q=5X^3+2X^2+X

b. Give a procedure that uses a stack in order to reverse the elements of a circular queue which is stored in an array.

c. What is binary search tree? Make a binary search tree for following sequence:
8 7 17 25 23 6 9 2 15 22 12 1

d. Write an algorithm to count the number of nodes in a given singly linked list.

e. Write a C program to implement Insertion sort.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) Write insertion algorithm for AVL tree. Write suitable rotation algorithms.
(b) Write ADT operations for heap sort. Using the above algorithm sort the following:35 45 25 11 6 85 17 35

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Sort the following sequence in ascending order using Selection sort.
C S E E N G I N E E R I N G

(b) What is searching? Write an algorithm for binary search with an example.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) (i) Explain how the following "infix" expression is evaluated with an example.
(ii) How do you push and pop elements in a stack.

(b) What are the types of queue? Explain with examples.

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain insertion and deletion algorithms on threaded binary trees

(b) a. Make a binary tree using:
INORDER→ Q B K C F A G P E D H R
POSTORDER→G B Q A C K F P D E R H

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) What is AVL tree? Make an AVL tree for the given sequence
50 33 44 77 35 60 40

(b) What is string? What is the first character of string? How can we access individual elements of a string?