P P SAVANI UNIVERSITY

Third Semester of B. Tech. Examination

May, 2019

SECE2031 Data Structures

23.05.2019, Thursday **Time: 09:00 a.m. To 11:30 a.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1	**Answer the following. (Any Five)**	**[05]**
(i)	Define Primitive and non-primitive data structures.	
(ii)	Define Queue.	
(iii)	Draw node structure of doubly linked list.	
(iv)	Define Linear Search.	
(v)	Define sorting.	
(vi)	What are self-referential structures?	
(vii)	What is stack full and stack empty condition?	
Q - 2 (a)	What is stack? Write an algorithm to insert and delete elements in stack.	**[05]**
Q - 2 (b)	Convert following expression into prefix notation. (using stack) (i) A - (B + C) /D (ii) (A * B) + C - D ^ E	**[05]**

OR

Q - 2 (a)	Differentiate between Linear and Non-Linear data structures.	**[05]**
Q - 2 (b)	Write an algorithm to insert operation at middle, and at end of singly linked list.	**[05]**
Q - 3 (a)	What is sorting? How bubble sort works?	**[05]**
Q - 3 (b)	Write binary search algorithm. Elaborate with an example.	**[05]**

OR

Q - 3 (a)	Define sparse matrix. Explain representation of sparse matrix.	**[05]**
Q - 3 (b)	Differentiate between static memory allocation and dynamic memory allocation.	**[05]**
Q	**Attempt any one.**	**[05]**
(i)	Discuss Tower of Hanoi.	
(ii)	Elaborate Selection sort.	

SECTION – II

Q - 1	**Answer the following (Any Five)**	**[05]**
(i)	Define tree.	
(ii)	Enlist binary tree traversal techniques.	
(iii)	Linked list is considered as an example of _____ type of memory allocation. a) Dynamic b) Static c) Compile time d) None of the mentioned	
(iv)	What is hash function?	
(v)	Define file, record and fields.	
(vi)	Define BFS.	
(vii)	Elaborate spanning tree.	

Q - 2 (a)	What is binary search tree? Create a binary search tree from following data 10,12,5,4,20,8,7,15,13	**[05]**
Q - 2 (b)	What are tree traversal techniques? Discuss with example.	**[05]**
	OR	
Q - 2 (a)	What is DFS? Discuss with an example.	**[05]**
Q - 2 (b)	Create Huffman tree for the string' mississippi'.	**[05]**
Q - 3 (a)	Discuss AVL tree with an example.	**[05]**
Q - 3 (b)	How to convert general tree to binary tree?	**[05]**
	OR	
Q - 3 (a)	Generate 2-3 tree for the data 60,20,10,30,25,50,80	**[05]**
Q - 3 (b)	Discuss Sequential, Indexed File Organization.	**[05]**
Q - 4	**Attempt any one.**	**[05]**
(i)	Discuss Threaded binary tree.	
(ii)	Write an algorithm for dynamic queue.	

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