P P SAVANI UNIVERSITY

Third Semester of B. Tech. Examination
December, 2018
SECE2031 Data Structures

26.12.2018, Wednesday	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)   A queue is a _____ approach.
 a) FIFO (First In First Out) list
 b) LIFO (Last In First Out) list
 c) ordered array
 d) linear tree

(ii)   In linked list each node contains minimum of two fields. One field is data field to store the data second field is?
 a) pointer to character
 b) pointer to integer
 c) pointer to node
 d) Node

(iii)   What do you understand by primary data structures?
(iv)   What is an ordered list?
(v)   Differentiate NULL and VOID.
(vi)   What is a linear search?
(vii)   Define circular queue.

Q - 2 (a)   Differentiate the following terms: **[05]**
 (i) Linear and Non-Linear Data Structures
 (ii) Primitive and Non-Primitive Data Structures

Q - 2 (b)   Convert following expressions into postfix notation.   **[05]**
 (i) A + (B - C) * D
 (ii) (A + B) \ C * D ^ E

OR

Q - 2 (a)   Explain PUSH and POP operation of the stack with algorithm.   **[05]**

Q - 2 (b)   Write an algorithm for insert operation at end of Singly Linked List.   **[05]**

Q - 3 (a)   Define Queue. Which condition is necessary for overflow and underflow in simple queue?   **[05]**

Q - 3 (b)   List out the advantages and disadvantages of Singly Linked List.   **[05]**

OR

Q - 3 (a)   Writer a program for bubble sort.   **[05]**

Q - 3 (b)   Write an algorithm for selection sort.   **[05]**

Q - 4	Attempt any one.	[05]
(i)	Explain delete operation of doubly linked list.	
(ii)	Write difference between LIFO and FIFO.	

SECTION – II

Q - 1	Answer the following. (Any Five)	[05]
(i)	Define height of a tree.	
(ii)	Define traversal.	
(iii)	What are the various ways of balancing an unbalanced tree.	
(iv)	List out types of graph.	
(v)	Define fields, record and file.	
(vi)	What are the different ways of representing a graph?	
(vii)	What do you understand by the degree of a node?	

| Q - 2 (a) | Differentiate between static and dynamic memory allocation. | [05] |
| Q - 2 (b) | What is binary search tree? Create a binary search tree from following data 10,12,5,4,20,8,7,15,13 | [05] |

OR

| Q - 2 (a) | Explain BFS with example. | [05] |
| Q - 2 (b) | Define Huffman coding with example. | [05] |

| Q - 3 (a) | Explain Binary search tree traversal technique with example. | [05] |
| Q - 3 (b) | Explain Hash collision Resolution Technique. | [05] |

OR

| Q - 3 (a) | Explain sequential file organization with advantages and disadvantages. | [05] |
| Q - 3 (b) | Write a program for dynamic stack. | [05] |

Q - 4	Attempt any one.	[05]
(i)	Spanning tree.	
(ii)	Prim's algorithm.	

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