P P SAVANI UNIVERSITY

2nd Semester of B. Sc. (IT) Examination

January 2022

SSIT1040 Data Structure

25.01.2022, Tuesday **Time: 12:30 p.m. To 3:00 p.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	Short Question (Any Five)	**[05]**
(i)	Define abstraction.	
(ii)	How to initialize two-dimensional matrix with 3 columns and 2 rows in C language?	
(iii)	What is row major order?	
(iv)	Convert following expression into prefix notation. (A + B) * C + D / (E + F * G) + H	
(v)	What is queue?	
(vi)	Write the condition for stack overflow.	
Q - 2 (a)	Explain Bubble Sort using suitable example.	**[05]**
Q - 2 (b)	Evaluate the following postfix expression in tabular form showing stack after every step. 7 6 + 4 * 4 10 + - 5 +.	**[05]**
	OR	
Q - 2 (b)	Explain Selection Sort algorithm.	**[05]**
Q - 3 (a)	Differentiate between Stack and Queue	**[05]**
Q - 3 (b)	Explain Radix Sort algorithm taking suitable example	**[05]**
	OR	
Q - 3 (b)	Explain different applications of queue.	**[05]**
Q - 4	Attempt any one.	**[05]**
(i)	Write an algorithm to convert an infix expression to postfix expression.	
(ii)	What is recursion? Explain Tower of Hanoi with example.	

SECTION – II

Q - 1	Short Question (Any Five)	**[05]**
(i)	BST stands for _____	
(ii)	What is AVL Tree?	
(iii)	BFS stands for _____	
(iv)	Find the worst-case time complexity in deletion of a node in Binary Search Tree?	
(v)	Define Dense and Sparse in terms of Graph.	
Q - 2 (a)	Preorder: 5,3,1,2,4,6,8,7 Find the Postorder Traversal of Binary Search Tree.	**[05]**
Q - 2 (b)	Write the algorithm of Breadth First Search (BFS) with example.	**[05]**
	OR	
Q - 2 (b)	Insert the element into Binary Search Tree 50,20,60,10,8,15,32,46,11,48	**[05]**
Q - 3 (a)	Give the algorithm for Depth First Search (DFS) with example.	**[05]**
Q - 3 (b)	What is Binary search tree? Differentiates between its different orders.	**[05]**

OR

Q - 3 (a)	Write a program to implement singly linked list and perform following operations. a) Insert node (at user choice position) b) Display List (traverse singly linked list)	**[05]**
Q - 4	Attempt any one.	**[05]**
(i)	Write algorithm for inserting and deleting an element in circular queue.	
(ii)	Explain doubly circular linked list. How it differentiates from linked list?	

****