Sri Siddhartha Institute of Technology, Tumkur

(A constituent college of Sri Siddhartha Academy of Higher Education, Tumkur)

CS3TH3: Data Structures

Date: 26-11-21 **TEST 1** Time: 9.15 am – 10.15 am

Q.No		M	C	B
1	Define a structure student, with at least 3 members. Write a C program to access the members. Show how to read and write the information from the structure.	6	1	3
2	Describe the following with the help of a block diagram: i) malloc( ) ii) calloc( ) iii) realloc ( )	6	1	2
3	Write a C program to perform queue operations for an array of size 4	6	2	3
4	Illustrate the procedure to convert infix expression to postfix expression with simple example.	6	3	3
5	Consider a container of size 5 : a. Give the 'C' code to insert an element into the front end of a container. b. Give the code to display the elements of a container, and also a message when there are no elements in it.	6	2	3

Sri Siddhartha Institute of Technology, Tumkur

(A constituent college of Sri Siddhartha Academy of Higher Education, Tumkur)

CS3TH3: Data Structures

Date: 31-12-21 **TEST 2** Time: 9.15 am – 10.15 am

Q.No		Marks	CO	BL
1	Write a C program to implement Priority Queues.	6	3	3
2	Define self-referential structure? Compare linked list with arrays	6	2	2
3	Write a C function to implement QUEUE using singly linked list.	6	3	3
4	Write a C function to Count the number of nodes in Singly Linked List. Describe using diagram.	6	3	3
5	Define doubly linked list? Give the Comparison between SLL and DLL	6	2	2

Sri Siddhartha Institute of Technology, Tumakuru

(A Constituent College of Sri Siddhartha Academy of Higher Education, Tumakuru)

CS3TH3 : Data Structures

Date: 04/02/22 **TEST III** Max. Marks: 20

Answer all the questions.

Q.No		M	CO	BL
1.	Describe tree terminologies with an example.	10	1	2
2.	For the given nodes: 10, 5, 15, 2, 1, 12, 11, 13, 4, 9, 20 i. Construct Binary tree and find its Inorder and Postorder traversals. ii. Construct Binary search tree and Find its Preorder and post order traversals.	10	4	3

Note: M- Marks, CO- Course Outcomes and BL-Bloom's level

2	0	C	S	0	5	2	

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY, TUMKUR.

(A Constituent College of Sri Siddhartha Academy of Higher Education, Agalakote, Tumkur.)

B.E., SEMESTER END EXAMINATION – FEB - MAR 2022

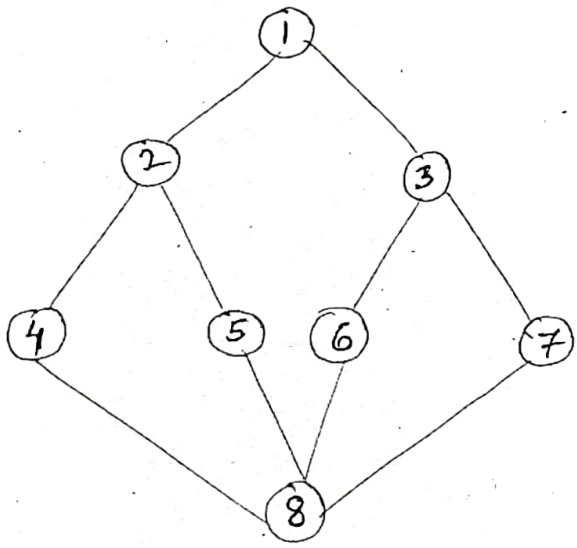
CS3TH3 : DATA STRUCTURES

TIME: 3.00 Hrs **SEMESTER : III** **MAX MARKS: 100**

NOTE: Answer any five full questions selecting one full question from each choice.

		Marks	CO	BL
1.a)	Write a C program to implement queue using array of size 5. Show extreme conditions.	10	2	2
b)	Describe memory allocation functions. Give syntax and an example for each.	10	1	1
	OR			
2.a)	What is postfix expression? Develop a C code to convert the given infix expression to postfix expression.	10	4	3
b)	Define Recursion. Give a recursive function to: (i) Solve tower of Hanoi problem (ii) find a key element in an array using binary search.	10	3	3
3.a)	State the basic functionality of a circular queue? Develop a C function to insert, delete and display the elements in a circular queue.	10	3	2
b)	Explain the following with examples: (i) Priority queues (ii) Header node.	10	1	1
	OR			
4.a)	Write a C program to create two linked list and join them to become one list. Display the node information before joining and after joining.	10	3	3
b)	Implement stack using singly linked list. Show full and empty conditions.	10	3	2
5.a)	Why circular list is more efficient? Write a C functions to : (i) Insert at rear end (ii) Insert at front end (iii) Delete based on information (iv) Display the node information	10	3	3
b)	Using circular doubly linked list, give a single piece of code to delete a particular node based on the given information, which has to satisfy the following condition: (i) If the node information is at the front end (ii) If the node information is at the rear end (iii) If the node information is in between front end and rear end (iv) If the node information is not in the list	10	3	3
	OR			
6.a)	Write a C functions to perform the following operations on doubly linked list: (i) Create a new node (ii) Insert a new node to the left of a specified information in the list (iii) Insert a new node to the right of specified information in the list. (iv) Delete a node based on the information.	10	3	3
b)	Implement queue using doubly linked list.	10	3	2

7.a)	Construct a binary search tree for the following sequence: 50, 28, 198, 78, 41, 18, 86, 35, 22, 54, 49 Also find all three traversal for the constructed tree.	10	2	3
b)	What is general tree? How it is different from binary tree? Explain how general tree is converted in to binary tree with an example.	10	1	1
	OR			
8.a)	Write a C program to construct binary search tree and performing all three traversals, using doubly linked list.	10	3	3
b)	Construct an expressions tree for the given expression: ((6+(3-2) * 5) ^ 2+3) Find Postfix Expressions and evaluate it.	10	4	3
9.a)	Write a procedure to perform depth first search traversal and breadth first search traversal. Find DFS and BFS traversals for the given graph.	10	2	3



b)	Define transitive closure of a directed graph. Find the same for the following adjacent matrix.	10	1	2
	OR			
10.	Explain the following: (i) Lexical search (ii) Tries (iii) Transitive closure (iv) Graph terminologies	20	1	1

****