MITE
Invent Solutions

MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust®, Mangalore)
Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi
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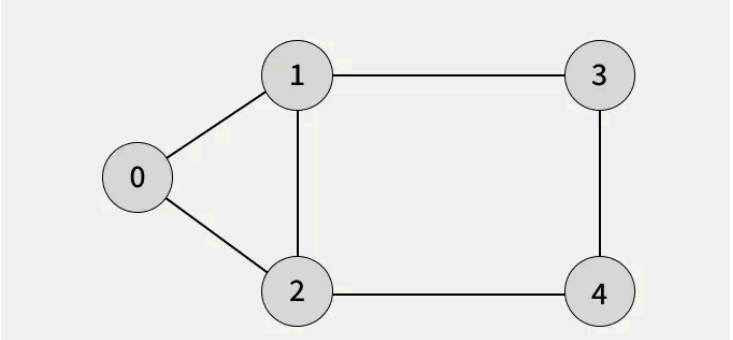
Model Question Paper

Fourth Semester BE Degree Examination

Data Structures and Algorithms

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

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

		Module -1	M	L	C
Q1	a.	What are Data Structures? Explain with example the classification of Data Structures.	6	L2	CO1
	b.	What is a Stack? Illustrate push, pop and display operations on stack using static array with C program.	8	L3	CO1
	c.	Describe Abstract Data Type (ADT) model and explain ADT for 1D Array.	6	L2	CO1
		Or			
Q2	a.	Explain the memory representation of a 2D Array with suitable example.	6	L2	CO1
	b.	What is an Ordinary Queue? Including the error conditions design a C program to perform Insert, delete and display operations on Queues using static array.	8	L3	CO1
	c.	Explain the tower of Hanoi problem with diagram.	6	L2	CO1
		Module 2			
Q3	a.	Illustrate singly linked list operations INSERT, DELETE, SEARCH with C program.	6	L3	CO2
	b.	Implement stack using Linked List with an example code snippet.	8	L3	CO2
	c.	Illustrate traversing and searching in a double linked list with an example code snippet.	6	L3	CO2
		Or			
Q4	a.	Illustrate addition of two polynomials using C program.	6	L3	CO2
	b.	Implement a C function for the following operation: i)Insertion of a node at the beginning of Double linked list. ii)Deletion of a node at the end of Double linked List.	8	L3	CO2
	c.	Illustrate insertion and deletion of a node at the beginning of the circular linked list with an example code snippet.	6	L3	CO2
		Module 3			
Q5	a.	What is binary tree? Explain the array representation and linked representation of binary trees with an example.	10	L3	CO3
	b.	 Apply the BFS traversal for the above graph and provide the recursive code snippet.	10	L3	CO3

Or					
Q6	a.	Construct the Binary Search Tree by inserting the following elements in the given order: 45, 25, 70, 60, 15, 90, 10, 95 Traverse the constructed binary tree using: In-order traversal, Pre-order traversal and Post-order traversal.	10	L3	CO3
	b.	What is minimum spanning tree? Illustrate Prim's algorithm with an example.	10	L3	CO3
Module 4					
Q7	a.	List asymptotic notations. Illustrate asymptotic notations with an example.	10	L3	CO4
	b.	Implement Brute-Force String Matching using C program.	10	L3	CO4
Or					
Q8	a.	Illustrate analysis framework with an example.	10	L3	CO4
	b.	Implement merge sort program using divide and conquer technique.	10	L3	CO4
Module 5					
Q9	a.	What is Decrease by Constant Method? Illustrate insertion sort using C program.	10	L3	CO4
	b.	What is greedy approach? Illustrate real time scheduling using queues with C program	10	L3	CO4
O5					
Q10	a.	Illustrate Optimal tree problems with an example.	10	L3	CO4
	b.	Implement BFS and DFS for a grid maze using C program.	10	L3	CO4

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