DEPARTMENT OF INFORMATION SCIENCE & TECHNOLOGY, ANNA UNIVERSITY, CHENNAI

INTERNAL ASSESSMENT TEST I

Semester I Programme MCA (Regular & SS) Day 15th Month 10 Year 2022

BX5011/ DATA STRUCTURES AND ALGORITHMS

Time: 90 minutes. Answer all questions Max. Marks: 50

CO 1	Analyze algorithms and determines their time complexity.
CO2	Understand the concepts of data types, data structures and linear structures
CO3	Apply data structures to solve various problems
CO4	Apply different Sorting, Searching and Hashing algorithms.
CO5	Understand non-linear data structures

BL- Bloom's Taxonomy Levels

(L1- Remembering, L2- Understanding, L3 — Applying, L4—Analyzing, L5 — Evaluating, L6 - Creating)

Guidelines

Level of Questions		Lower Order (L1 and L2)	Intermediate Order (L3 and L4)	Higher order (L5 and L6)
Recommended Mark Distribution(%)	UG	20to35	Minimum 40	15 to 25
	PG	10to25	Minimum 50	15 to 25

Part C question must be of High Order

Either OR Choices has to be of same order related to the same CO.

Sl. No.	Question	Marks	CO	BL
	PART A (7 X 2 = 14 marks)			
1.	Define data structure and state different Data Structures	2	CO1	L1
2.	Explain ADT with example	2	CO1	L1
3.	How to calculate the range of an 1D array	2	CO4	L3
4.	Calculate the complexity of binary search tree	2	CO5	L4
5.	List the application of stack and real world examples	2	CO4	L2
6.	What is the postfix expression of (5*(2-(1+3)))	2	CO4	L3

7.	What is the output of this program?
	#include <stdio.h>
	int main(){
	void num=10;
	printf("%v", num);
	return 0;
	}
		2	CO1	L5

	PART B (2 X 12 = 24 marks)			
8 (a) i)	Explain in detail about ADT (6)	12	CO1	L3
ii)	Write note on fundamentals of algorithmic problem solving and state the important problems (6)			
	(OR)			
8(b)	Explain array and its representation with simple c program	12	CO1	L3

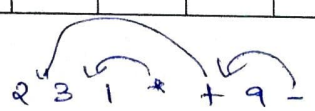
9(a)	Explain implementation of stack using array	12	CO4	L2 & L3
	(OR)			
9(b)	Explain in detail about queue and implementation of linear queue	12	CO4	L2 & L3

	PART C (1X 12 = 12 marks)			
10	Convert infix expression to postfix A+ (B*C-(D/E^F)*G)*H with detail steps (6) (ii) Evaluate post fix expression "2 3 1 * + 9 -"	12	CO5	L5

Mark Distribution Checklist

Question	Marks/CO					Total	Marks/BL					
	CO1	CO2	CO3	CO4	CO5	Marks	BL1	BL2	BL3	BL4	BL5	BL6
1	2					2	2					
2	2					2	2					
3			2			2			2			
4				2		2				2		
5		2				2		2				
6			2			2			2			
7					2	2					2	
8			12			12			12			
9			12			12			12			
10					12	12					12	
Total	4	2	28	2	14	50	6		30		14	
Mark Distribution (%)	8%	4%	56%	4%	28%	100	12%		60%		28%	

Professor In charge



(2 + (3 * 1)) - 9

(2 + 3) - 9

5 - 9 = -4

A + (B * C - (D / E ^ F) * G) * H

A (B * C - (D / E ^ F) * G) * H +

A (B * C - (D / E ^ F) * G) H * * +

A B C * - (D / E F ^) * G H * +

A B C * - (D E F ^ /) * G H * +

A B C * - D E F ^ / G * H * +

A B C * D E F ^ / G * - H * +

DEPARTMENT OF INFORMATION SCIENCE & TECHNOLOGY, ANNA UNIVERSITY, CHENNAI

INTERNAL ASSESSMENT TEST II

Semester I Programme MCA (Regular & SS) Day 08th Month 11 Year 2022

BX5011/DATA STRUCTURES AND ALGORITHMS

Time: 90 minutes. Answer all questions Max. Marks: 50

CO 1	Analyze algorithms and determines their time complexity.
CO2	Understand the concepts of data types, data structures and linear structures
CO3	Apply data structures to solve various problems
CO4	Apply different Sorting, Searching and Hashing algorithms.
CO5	Understand non-linear data structures

BL- Bloom's Taxonomy Levels

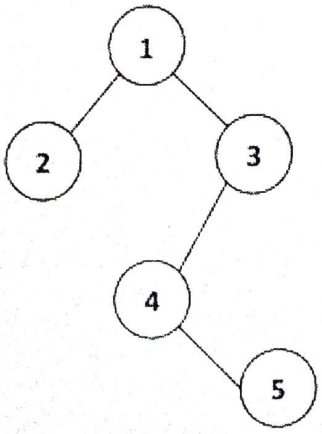
(L1- Remembering, L2- Understanding, L3 — Applying, L4—Analyzing, L5 — Evaluating, L6 - Creating)

Guidelines

Level of Questions		Lower Order (L1 and L2)	Intermediate Order (L3 and L4)	Higher order (L5 and L6)
Recommended Mark Distribution(%)	UG	20to35	Minimum 40	15 to 25
	PG	10to25	Minimum 50	15 to 25

Part C question must be of High Order

Either OR Choices has to be of same order related to the same CO.

Sl. No.	Question	Marks	CO	BL
	PART A (7 X 2 = 14 marks)			
1.	Discuss advantages and disadvantages of linked list over array.	2	CO2	L2
2.	Explain List ADT with example	2	CO2	L1
3.	Define binary tree	2	CO4	L1
4.	Define hashing and explain its type	2	CO4	L2
5.	Give traversal order of following tree into Inorder, Preorder and Postorder. 	2	CO5	L5
6.	What is the application of Linked list?	2	CO2	L2

7.	What is Depth-first traversal?	2	CO5	L2
	PART B (2 X 12 = 24 marks)			
8 (a)	Define singly linked list with implementation	12	CO3	L3
	(OR)			
8(b)	Define doubly linked list with implementation code	12	CO3	L3
9(a)	Explain linear search and binary search with its difference	5	CO4	L2 & L3
	Describe the algorithm to sort the following array: 77,33,44,11,88,22,66,55 (i) Insertion sort (ii) selection sort	7	CO4	L5
	(OR)			
9(b) (i)	Explain in detail about left child right sibling data structures for general trees	7	CO4	L2 & L3
(ii)	Explain in detail about Graph and its representation?	5	CO5	L2

	PART C (1X 12 = 12 marks)			
10	Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function h(x)= x(mod 10), show the resulting i) Open Addressing ii) Separate Chaining	12	CO5	L5

Mark Distribution Checklist

Question	Marks/CO					Total	Marks/BL					
	CO1	CO2	CO3	CO4	CO5	Marks	BL1	BL2	BL3	BL4	BL5	BL6
1		2				2		2				
2		2				2	2					
3				2		2	2					
4				2		2		2				
5					2	2					2	
6		2				2		2				
7					2	2		2				
8			12			12			12			
9				12		12			5		7	
10					12	12					12	
Total	0	6	12	16	16	50	12		17		21	
Mark Distribution (%)	0%	12%	24%	32%	32%	100	24%		34%		42%	

Professor In charge