SRM Institute of Science and Technology
Faculty of Engineering and Technology
DEPARTMENT OF CSE
Vadapalani Campus, Chennai 600026, Tamilnadu

Academic Year: 2024-25 Semester: ODD

Mode of Exam
OFFLINE
SET-A

Test: CLAT-1 **Date: 28.08.2024**
Course Code & Title: 21CSC201-DATA STRUCTURES AND ALGORITHMS **Duration:** 45 mins
Year & Sem: II / 3rd SEM **Max. Marks:** 25

Course Articulation Matrix:

	PROGRAM OUTCOME (POs)															
		GRADUATE ATTRIBUTES												PSO		
CO	COURSE OUTCOME (COs)	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Develop programs using data types like structures, pointers and arrays supported by C programming language	*1*	-	*3*	-	-	-	-	-	-	-	-	-	*1*	-	*2*
2	Analyze the complexity of algorithm and if needed, modify it to improve its efficiency	*2*	*3*	-	*1*	-	-	-	-	-	-	-	-	*1*	*2*	-
3	Identify and Use appropriate data structure for devising solution	*1*	*3*	*2*	-	-	-	-	-	-	-	-	-	*1*	*1*	*2*
4	Describe and use tree structure while developing programs	*2*	-	*3*	*2*	-	-	-	-	-	-	-	-	*1*	-	*2*
5	Implement the Graph structure and use it whenever deemed necessary for providing better solution	*3*	*2*	*3*	-	-	-	-	-	-	-	-	-	*1*	*1*	*2*
6	Decide and use appropriate searching and sorting algorithms while developing solutions for specific problems	*1*	*3*	-	*2*	-	-	-	-	-	-	-	-	*1*	*1*	*1*

Part – A (12 x 01 = 12 Marks)
Instruction: Answer All Questions

Q. No.	Question	Marks	BL	CO	PO
1	Which of the following is NOT a primitive data type a) Int b) Char c) Array d) Double	1	1	1	1
2	Having a line of code s.n.f=”ABCD” indicates a) Syntax Error b) Normal variable name c) f is of double d) Structure	1	2	1	1
3	User-defined data type can be implemented by_____ a) Enum b) Structure c) Typedef d) All of the above	1	1	1	2
4	Which of the following cannot be a structure member? a) Long b) Another structure c) Structure pointer d) A function	1	1	1	1

5	struct student
	{
	  char *name;
	};
	struct student fun(void)
	{
	  struct student s;
	  s.name = "Alan";
	  return s;
	}
	int main()
	{
	  struct student m = fun();
	  s.name = "Turing";
	  printf("%s", m.name);
	  return 0;
	}
	The output of the code is
	
	a) Compilation Error b) Alan
	c) Turing d) Runtime Error
		1	2	1	2

6	The correct syntax to access the member of the ith structure in the array of structures is? struct temp { int num; } stmp[10]; a) stmp.num[I]. b) stmp.i.num c) stmp[I].num d) stmp.num[I]	1	2	1	1

7	Consider the following statements
	int a = 10, b=20;
	int *p=&a, *q=&b;
	p=q;
	
	a) Both a and b has 20
	b) Both p and q will point to b
	c) Both p and q will point to a
	d) Both a and b has 10
		1	2	1	1

8	#include <stdio.h>
	int main()
	{
	int a[]={1, 2, 3, 4, 5, 6, 7};
	int *p=a+4;
	printf("%d\n", *p);
	return 0;
	}
	The output is
	
	a) 5 b) 4
	c) 1 d) Error
		1	2	1	2

9	Which of the given options provides the increasing order of asymptotic complexity of functions f1, f2, f3, and f4? f1=10*n f2=n^2 f3=n*logn f4=4^n a) f1, f4, f2, f3. b) f3, f1, f2, f4. c) f3, f2, f1, f4. d) f1, f3, f2, f4.	1	2	1	2
10	Which data structure is defined as a collection of similar data elements? a) Arrays b) Linked List c) Trees d) Graphs	1	1	1	2
11	Which of the following is/are true a) calloc allocates memory and initializes the allocated memory whereas malloc allocated memory has random data b) calloc takes 2 arguments whereas malloc takes one c) Both malloc and calloc returns void * pointers d) All of the above	1	1	1	2
12	We use malloc and calloc for a) Dynamic memory allocation b) Static memory allocation c) Both static and dynamic memory allocation d) None of the above	1	1	1	2
Part – B (01 x 08 = 8 Marks) **Instruction: Answer in Detail**					
13 a	Distinguish the different types of non-primitive data structures.	8	2	1	1
OR					

13 b	Explain Big O, Omega and Theta asymptotic notations and their significance.	8	2	1	1
Part – C (01 x 05 = 05 Marks) Instruction: Answer any ONE out of two					
14	Illustrate passing structure as an input parameter to a function with a suitable c code.	5	3	1	1
15	Apply dynamically memory allocation for input matrices and perform matrix addition.	5	3	1	2

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions