STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086 (For candidates admitted from the academic year 2023 – 2024)

B.C.A. DEGREE EXAMINATION, APRIL 2024 SECOND SEMESTER

COURSE : MAJOR CORE

PAPER : ALGORITHMS AND DATA STRUCTURES

SUBJECT CODE: 23CS/MC/AD23

TIME : 3 HOURS MAX. MARKS: 100

Q.	SECTION A	CO	KL
No.	Objective Type Questions (10 x 1=10)		
1.	If the data contains set of values, they can be represented using	CO1	K1
	data types.		
	a) primitive b) non- primitive c) both a and b d) None of the above		
2.	The complexity of bubble sort algorithm in the worst case is	CO1	K1
	represented as		
	a) $n/2$ b) $n^2/2$ c) $(n-1)/2$ d) $n(n-1)/2$		
3.	List of unused memory cells are called as	CO1	K 1
	a) Free storage list b) free pool		
	c) both a and b d) None of the above		
4.	Deleting a node from a linked list will return its memory to	CO1	K1
	a) LINK list b) NULL list		
	c) AVAIL list d) none of the above	G0.1	TT 4
5.	The correct form of infix to postfix notation for 1* (2+3)-4/5	CO1	K1
	is		
	a) 1 2 3 4 5 * + - / b) 1 2 3 + * 4 5 / - c) 2 3 4 5 / - * + d) None of the above.		
	c) $2 3 4 5 / - \% +$ d) None of the above.	CO2	TZ 1
6.	of the following applies divide and conquer	CO2	K1
	strategy.		
	a) Quick sort b) binary search c) both a and b		
7.	c) both a and b d) None of the above	CO2	K1
/.	A binary tree is said to be an extended binary tree if each node	CO2	ΚI
	has either or children. a) 0,1 b) 0,2 c) 0,3 d) 0,4		
8.	In a grounded- header list, the last node contains the	CO2	K1
0.	a) One-way list b) two-way list	CO2	KI
	c) Null pointer d) none of the above		
9.	A connected graph without cycles is called	CO2	K1
	a) Hash b) Tree c) Multi Graph d) none of the above.	202	121
10.	Two different keys yielding the same hash address is called	CO2	K1
10.		202	121
	a) Indexing b) squeezing c) collision d) None of the above		
Q. No.		CO	KL
2.1.0	(10 M 1-10)		
11.	is an intermediate state between an algorithm	CO3	K2
	and a program.		
12.	Complexity of an algorithm is the function of &	CO3	K2
	1 , , , , , , , , , , , , , , , , , , ,		
13.	Arrays are called dynamic data structure. Say true/false.	CO3	K2

14.	Linked list is an example for data structure.	CO3	K2
15.	The data structure which restricts insertion and deletion in the middle is	CO3	K2
16.	The prefix form of A+(B*C)/(D-E) is	CO4	K2
17.	The structure used to represent hierarchical relationship between elements is	CO4	K2
18.	A terminal node is called as	CO4	K2
19.	A Graph is if there is a path between any two of its nodes.	CO4	K2
20.	The disadvantage of linear probing is	CO4	K2
Q. No.	SECTION B	CO	KL
	Answer all the questions $(4 \times 5=20)$		
21.	a) How do you experiment the efficiency of an algorithm? Discuss.	CO1	К3
	(OR)		
	b) What is ADT? Differentiate Data structures and ADT with		
	suitable example for each.		
22.	a) With a neat sketch explain circular linked list with suitable example.	CO2	К3
	(OR)		
	b) What is recursion? Relate and explain how recursion is		
	implemented by stack.	002	77.4
23.	a) Distinguish the queue operations enqueue and dequeue with suitable example.	CO3	K4
	(OR)		
	b) Analyse open addressing hashing technique.		
24.	a) Mention the different operations that can be performed on graphs and explain it.	CO4	K4
	(OR)		
	b) Explicate the shortest path algorithm.		
Q. No.	SECTION C	CO	KL
	Answer all the questions (5 x 12=60)		
25.	a) Enumerate with example the linear search algorithm and	CO1	K1
	the method of computing the complexity. (OR)		
	b) Show how insertion sort is performed.		
26		CO2	V2
26.	a) Demonstrate the following operations: traversing, searching and inserting into an array.	CO2	K2
	(OR)		
	b) Explain the method of inserting and deleting a given item in a linked list.		

27.	a) Define Stack and illustrate the possible operations that can	CO3	K3
	be performed on it.		
	(OR)		
	b) Let P be an arithmetic expression: (3+6)*(2-4)+7.		
	Apply the algorithm to transfer infix expression to postfix.		
28.	a) What are the standard ways of traversing a binary tree?	CO4	K4
	Analyze the traversal algorithms with example.		
	(OR)		
	b) Explicate Heap sort algorithm.		
29.	a) Appraise the methods of traversing a Graph with suitable	CO5	K5
	example.		
	(OR)		
	b) Delineate the hashing techniques.		
