07 AUG 2023

Reg. No.												

Question Paper Code	12118

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Second Semester

Computer Science and Business Systems

(Common to Artificial Intelligence and Data Science & Computer Science and Engineering (AIML))

20CBPC201 - DATA STRUCTURES AND ALGORITHMS

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	What is meant by recursive algorithm?	2,K1,CO1
2.	Differentiate time complexity and space complexity.	2,K1,CO1
3.	Write about Abstract data types with examples.	2,K1,CO2
4.	List out the various application of Stack.	2,K1,CO2
5.	Define sorting.	2,K1,CO4
6.	What do you mean by internal and external sorting?	2,K1,CO4
7.	Discuss the merits of hash function.	2,K1,CO5
8.	Define collision in hashing.	2,K1,CO5
9.	What is File organization? In what way it is useful?	2,K1,CO6
10.	Brief inverted files.	2,K1,CO6

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Discuss performance analysis of the algorithm elaborately.	13,K2,CO1
		OR	
	b)	Explain Asymptotic Notations.	13,K2,CO1
12.	a)	Explain how to evaluate arithmetic expressions using stacks.	13,K2,CO2
		OR	
	b)	What is the problem encountered with the circular queue? Explain how the dynamic circular queue can solve the problem with example.	13,K2,CO2
13.	a)	Describe in detail about heap sort with routines and examples.	13,K2,CO4
		OR	
	b)	Sort the list of elements 44,33,11,55,77,90,40,60,99,22,88 using quick sort.	13,K2,CO4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

14. a) Define hashing. Briefly explain various collision resolution techniques. *13,K2,CO5*

OR

b) Using linear search delete the number 26 from the list of numbers given 10, 7, 17, 26, 32, 94 and write a C Program to implement the same. *13,K2,CO5*

15. a) Discuss in detail about the types of files. *13,K2,CO6*

OR

b) Explain in detail about Indexed Sequential Access Method. *13,K2,CO6*

PART - C (1 × 15 = 15 Marks)

16. a) Construct an expression tree for the expression (a+b*c) + ((d*e+l) * g). Give the outputs when you apply preorder, inorder and postorder traversals. *15,K3,CO3*

OR

b) What is a Binary Search Tree (BST)? Make a BST for the following sequence of numbers. 45, 36, 76, 23, 89, 115, 98, 39, 41, 56, 69, 48 Traverse the tree in Preorder, Inorder and postorder. *15,K3,CO3*