PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B. TECH MIDSEM EXAMINATION
3rd SEMESTER
ACY-2022-23 (ODD SEM)

Subject Name (Code): Data Structure and Algorithms (203105205)   **Branch: CSE**

Date: 04-08-22   **Time: 02:30-04:00**   **Total Marks: 40**

Sr. No.		Marks
Q.1	(A) One-line Questions 1. A data structure has well defined _____ and _____. 2. What is an Algorithm? 3. What is LIFO? 4. Formulae based representation uses _____ to represent the instances of object 5. When QUEUE is full and we want to insert an element in it then this condition is called_____.	05

	(B) Compulsory Question
	
	1. State True or False.
	   (i) Binary search is used for searching in a sorted array.
	
	   (ii) The time complexity of binary search is O(logn).
	
	a) True, False
	b) False, True
	c) False, False
	d) True, True
	
	2. Which of the following is the prefix form of A+B*C?
	
	a) A+(BC*)
	b) +AB*C
	c) ABC+*
	d) +A*BC
		05

3. Which of the following principle does Queue use?

a) LIFO principle
b) FIFO principle
c) Linear tree
d) Ordered array

4. The case in which a key other than the desired one is kept at the identified location is called?
a) Hashing
b) Collision
c) Chaining
d) Open addressing

5. A linear data structure in which insertion and deletion operations can be performed from both the ends is___
a) Queue
b) Deque
c) Priority queue
d) Circular queue

Q.2	Attempt any four (Short Questions)	12
	(1) What is Polish and Reverse polish notation? Give examples for each?	
	(2) Define hashing and hash collision.	
	(3) Evaluate the following postfix expression ab*cd*+ where a=2, b=2, c=3, d=4.	
	(4) Write an algorithm for deletion (POP) operation in STACK.	
	(5) Define DEQUEUE.	
Q.3	Attempt any two	08
	(1) Why Binary Search algorithm is more efficient than linear search? Depict your answer with suitable example? Mention the time complexity level of two algorithms.	
	(2) Define Space and Time Complexity.	
	(3) Explain Data Structure and its various types.	
Q.4	(A) Write an algorithm to convert a given infix expression to postfix expression? Trace the steps involved in converting the given infix expression K + L - M*N + (O^P) * W/U/V * T + Q to postfix expression.	05
	(B) Explain Bubble Sort with the given elements of array 13,32,26,35,10? Mention the best case and worst-case time complexity of Bubble sort algorithm?	05
	OR	
	(B) What is MIN-Heap? Create the MIN-Heap for the given data set. 6,15,50,333,45,40,80,10	05