Roll No: | | | | | | | | | | | |

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi | Approved By BCI
Bengaluru

Mid Term Examinations - October 2026

Date: 05/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: CSS2278 **Course Name:** Data Structures and Analysis of Algorithms

Semester: Third Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2
Marks	26	64

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	**Define Data and Information. Give one example of each.**	2	CO1	BT1
2	**Differentiate between Linear and Non-Linear Data Structures with one example each.**	2	CO1	BT2

3	**What is the time complexity of the following code?**
	`for(i=0; i<n; i++)`
	`printf("%d", i);`
		2	CO1	BT1

4	**What is the output of the following postfix expression?** `5 3 + 2 *`	2	CO2	BT1
5	**A queue contains `10, 20, 30, 40`, where 10 is at the front. If one deletion operation is performed, which element is removed?**	2	CO2	BT2

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	**a) Explain Data Structures and classify them into Linear and Non-Linear Data Structures. (5 Marks)** **b) Explain the characteristics of an algorithm. (5 Marks)**	10	CO1	BT2
7	**a) Explain Time Complexity and Space Complexity. (5 Marks)** **b) Explain Big-O, Θ and Ω notations. (5 Marks)**	10	CO1	BT2

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	**Explain singly, doubly, and circular linked lists with their node representations, traversal methods, advantages, and limitations.**	10	CO2	BT2
9	**Write a C program to implement insertion and deletion operations at the beginning of a singly linked list and explain the working of the program.**	10	CO2	BT3

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
10	**Write a C program to implement a stack using an array with PUSH, POP, and DISPLAY operations. Explain how overflow and underflow are handled.**	10	CO2	BT3

11	**Explain the applications of stacks in expression evaluation and recursion with suitable examples.**	10	CO2	BT2

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	**A university computer lab has a printer shared by many students. Print requests arrive at different times and must be processed in the order in which they are received. Explain how a queue can be used to manage the print requests. Design the required enqueue and dequeue operations and write a C program to implement the printer queue using an array.**	10	CO2	BT3
13	**A parking area has only 5 parking slots. Cars enter and leave throughout the day. A simple linear queue may leave unused spaces at the beginning of the array after cars leave. Explain why a circular queue is more suitable for this parking management system. Illustrate the enqueue and dequeue operations with a suitable example.**	10	CO2	BT3