



# PRESIDENCY UNIVERSITY

BENGALURU

Roll No.															
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## End - Term Examinations - December 2025

Date: 09 - 12- 2025

Time: 09:30am - 12:30pm

<b>School:</b> SOIS	<b>Program:</b> BCA/BCA-DS/BCA-AIML	
<b>Course Code:</b> CSA2505	<b>Course Name:</b> Analysis of Algorithms	
<b>Semester:</b> III	<b>Max Marks:</b> 100	<b>Weightage:</b> 50%

CO - Levels	C01	C02	C03	C04	C05
Marks	2	22	26	26	24

### Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

### Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	Define Asymptotic Notations and its types.	2 Marks	L2	C01
2.	Differentiate between feasible solution and optimal solution.	2 Marks	L3	C02
3.	Define the Divide and Conquer strategy.	2 Marks	L3	C03
4.	What is Binary Search ?	2 Marks	L3	C03
5.	Define Merge Sort and write its time complexity	2 Marks	L3	C03
6.	Define Dynamic Programming.	2 Marks	L3	C04
7.	List any four problems solved using Dynamic Programming	2 Marks	L3	C04
8.	Write Floyd's Algorithm.	2 Marks	L3	C04
9.	Define Hamiltonian Path Problem	2 Marks	L3	C05
10.	List the steps of Kruskal's algorithm in brief.	2 Marks	L3	C05

## Part B

**Answer the Questions.**

**Total Marks 80M**

<b>11.</b>	<b>a.</b>	Explain the Bubble Sort and Selection Sort algorithm and apply both sorting algorithm to sort the given set of numbers: [46, 83, 5, 98, 51, 92, 43].	<b>20 Marks</b>	<b>L3</b>	<b>CO2</b>
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**Or**

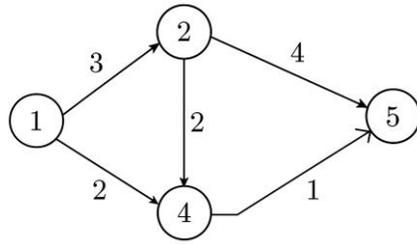
<b>12.</b>	<b>a.</b>	<p>Explain the Traveling Salesman Problem (TSP) and Find the shortest tour for given graph.</p> <div style="text-align: center;"> <pre> graph TD     A --- 7  B     A --- 1  E     A --- 8  D     B --- 3  C     C --- 2  D     C --- 6  E     D --- 7  E             </pre> </div> <p>Find the optimal solution for the given assignment problem.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Job 1</th> <th style="text-align: center;">Job 2</th> <th style="text-align: center;">Job 3</th> </tr> </thead> <tbody> <tr> <th style="text-align: center;">A</th> <td style="text-align: center;">8</td> <td style="text-align: center;">6</td> <td style="text-align: center;">10</td> </tr> <tr> <th style="text-align: center;">B</th> <td style="text-align: center;">9</td> <td style="text-align: center;">12</td> <td style="text-align: center;">7</td> </tr> <tr> <th style="text-align: center;">C</th> <td style="text-align: center;">7</td> <td style="text-align: center;">5</td> <td style="text-align: center;">11</td> </tr> </tbody> </table>		Job 1	Job 2	Job 3	A	8	6	10	B	9	12	7	C	7	5	11	<b>20 Marks</b>	<b>L3</b>	<b>CO2</b>
	Job 1	Job 2	Job 3																		
A	8	6	10																		
B	9	12	7																		
C	7	5	11																		

<b>13.</b>	<b>a.</b>	Explain the Merge Sort and its algorithm and apply it to sort the given set of numbers: [85,12,9,75,49,72,99,78,97,62,19].	<b>20 Marks</b>	<b>L3</b>	<b>CO3</b>
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**Or**

<b>14.</b>	<b>a.</b>	Explain the Quick Sort and its algorithm and apply it to sort the given set of numbers: [85,12,9,75,49,72,99,78,97,62,19].	<b>20 Marks</b>	<b>L3</b>	<b>CO3</b>
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<b>15.</b>	<b>a.</b>	Explain the concept of a Multi-Stage Graph Using the following graph, write an algorithm to find the shortest path from source to destination using Dynamic Programming.	<b>20 Marks</b>	<b>L3</b>	<b>CO4</b>
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Or

16.

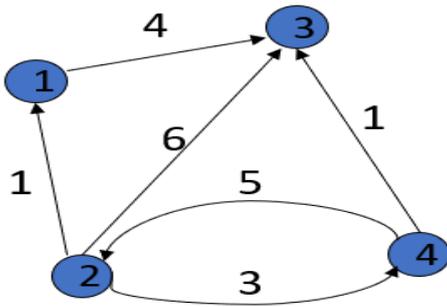
a.

Explain Floyd's Algorithm and find All pairs shortest paths for the below graph

20 Marks

L3

C04



17.

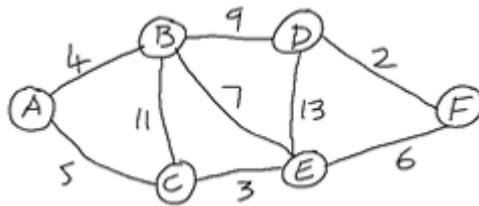
a.

Write Dijkstra's Shortest path algorithm. What is the Shortest Path from Node A to Node F and Total Cost from the below graph using Dijkstra's Algorithm?

20 Marks

L3

C05



Or

18.

a.

Explain in details about the following

1. N Queens Problem
2. Hamiltonian Path Problem

20 Marks

L3

C05