Roll No												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF COMMERCE

Make Up Examinations – December 2025

Semester: MK

Course Code: MAT2029

Course Name: Optimization Techniques

Program :

Date: 26-12-2025

Time: 09:30AM TO 12:30PM

Max Marks: 100

Weightage: 50%

Instructions:

(i) Read the all questions carefully and answer accordingly.

(ii) Answer all the questions.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries 1 mark. (10Qx 1M= 10M)

1) The solution to a transportation problem with 'm' rows and 'n' columns is feasible if the number of positive allocations are (CO3) [Knowledge]

a) m + n b) m x n c) m +n – 1 d) m +n + 1

2) _____use of this model it to investigate the outcomes of various alternative courses of action. (CO1) [Knowledge]

a) Predictive model b) Descriptive model c) Optimization model d) None of these

3) The Hungarian method for solving an assignment problem can also be used to solve: (CO3) [Knowledge]

a) A transportation problem b) Salesman problem c) LPP d) Both (a) and (b)

4) All the parameters in the linear programming model are assumed to be (CO2) [Knowledge]

a) Variables b) Constraints c) Functions d) None of these

5) _____ are the restrictions or limitations imposed on the Linear Programming Problem. (CO2) [Knowledge]

a) Variables b) Costs c) Profits d) Constraints

6) Operations Research is a very powerful tool for _____ (CO1) [Knowledge]

a) Operations b) Research c) Decision making d) None of these

7) The region of feasible solution in Linear Programming problem method is called _____ (CO2) [Knowledge]

a) Infeasible Region b) Unbounded Region c) Infinite Region d) feasible Region

8) The graphical method if LPP uses (CO2) [Knowledge]

a) Linear equations b) Constraint equations c) Objective function d) All of the above

9) While solving a LPP graphically, the area bounded by constraints is called (CO2) [Knowledge]

a) Feasible region b) Infeasible region c) Unbounded region d) None of these

10) _____ method is used to solve an assignment problem. (CO3) [Knowledge]

a) American method b) Hungarian method c) German method d) British method

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries 10 marks. (5Qx10M=50M)

11) Briefly explain the main phases of Operations Research? (CO1) [Comprehension]

12) A Manufacturer produces 3 models I, II and III of a certain product using raw materials A and B. The following table gives the data. Formulate this problem as a Linear programming model. (CO2) [Comprehension]

Raw Material	Requirement per Unit			Availability
	I	II	III	
A	2	3	5	4000
B	4	2	7	6000
Min Demand	200	200	150	---
Profit / Unit	30	20	50	---

13) Find the initial solution for the given transportation problem by any two methods of your choice. (CO3) [Comprehension]

	D1	D2	D3	D4	**Supply**
O1	19	30	50	10	**7**
O2	70	30	40	60	**9**
O3	40	8	70	20	**18**
Demand	**5**	**8**	**7**	**14**	

14) Find the Optimal solution using Hungarian Method. (CO3) [Comprehension]

	A	**B**	**C**	**D**
P	8	26	17	11
Q	13	28	4	26
R	38	19	18	15
S	19	26	24	10

15) Construct a network for the project whose activities and precedence relationships are as given below: (CO4) [Comprehension]

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	--	--	A	A	I,J,K	B,D	B,D	F	A	G,H	F

Part C [Problem Solving Questions]

Answer all the Questions. Each question carries 20 marks. (2Qx20M=40M)

16) Briefly explain the formulation of LPP using Graphical Method. (CO2) [Application]

Maximize $Z = 3x + 5y$

Subject to the constraints $x \leq 4$

$2y \leq 12$

$3x + 2y \leq 18$

where $x, y \geq 0$ using graphical method.

17) A project schedule has the following characteristics. (CO4) [Application]

Activity	1-2	1-3	2-4	3-4	3-5	4-9	5-6	5-7	6-8	7-8	8-10	9-10
Time (Days)	4	1	1	1	6	5	4	8	1	2	5	7

From the following information, you are required to

a) Construct a network diagram.
b) Compute the earliest and latest event time.
c) Determine the critical path and project duration.
d) Compute total and free float for each activity.

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