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UG Mechanical 2024-25 PYQP

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2025-05-05

INDUSTRIAL ENGINEERING AND OPERATIONS RESEARCH

Department of Mechanical Engineering – SEAS

SRM UNIVERSITY A.P

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SRM UNIVERSITY – AP, ANDHRA PRADESH

End Term Examination, May 2025

[Question Paper ID: 008930]

Subject	: INDUSTRIAL ENGINEERING AND OPERATIONS	Subject	: MCE 210
Title	RESEARCH	Code	
Batch	: 2023	Max Marks	: 50
Degree	: B.Tech.	Duration	: 2 hours
Branch	: ME	QP Set	: ---

Section-1 (1X20=20Marks) (1 × 20 Marks = 20 Marks)

Marks BL CO

Answer **all** Questions

1. A company operates **three plants** (P1, P2, P3) supplying goods to **four warehouses** (W1, W2, W3, W4). The supply and demand at each location is given in the table below. The transportation cost is as follows: 20 20 3 2,4

Plants \ Warehouses	W1	W2	W3	W4	Supply
P1	6	4	7	5	20
P2	8	10	6	9	30
P3	7	6	8	4	25
Demand	10	25	30	10	

Find the optimal transportation schedule that minimizes the total transportation cost using:

- Vogel's Approximation Method (VAM)** for IBFS
- Method of Multipliers** ($u_i + v_j - c_{ij}$) for optimality test

Section-2 (2X15=30 Marks) Answer all the questions (2 × 15 Marks = 30 Marks)

Marks BL CO

Answer **all** Questions

2. Four drivers (P, Q, R, S) are to be assigned to four delivery routes (A, B, C, D). The cost (in fuel units) is provided in Table below. Find the optimal cost of assignment of drivers to routes based on the Hungarian method. 15 15 3 1,3

Drivers	Route A	Route B	Route C	Route D
P	10	3	5	9
Q	8	7	4	6
R	6	9	8	5
S	7	4	3	10

3. Solve the LPP problem using the simplex method. 15 15 3 1,3

Maximize $Z = 6x_1 + 5x_2$

Subject to:

$$x_1 + x_2 \leq 5$$

$$3x_1 + 2x_2 \leq 12$$

$$x_1, x_2 \geq 0$$

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