



VIT

Vellore Institute of Technology
Vellore, Tamil Nadu, India

REG.NO.:

**SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026**

SLOT: D1

Programme Name & Branch : B.Tech. Computer Science and Business Systems
Course Code and Course Name : CBS1008 and Operations Research
Faculty Name(s) : Dr.D.Anuradha, Dr. Umakanta Mishra
Class Number(s) : VL2025260104412, VL2025260104409
Date of Examination : 20-8-2025
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes
 1. Apply operations research techniques like LPP, scheduling and sequencing in industrial optimization problems
 2. Solve allocation problems using various OR methods

Q. No	Question	M	CO	BL																														
1.	Dorian makes luxury cars and jeeps for high income men and women. It wishes to advertise with 1 minute spots in comedy shows and football games. Each comedy spot costs \$50K and is seen by 7M high income women and 2M high income men. Each football spot costs \$100K and is seen by 2M high income women and 12M high income men. How can Dorian reach 28M high income women and 24M high income men at the minimum cost? Formulate the mathematical linear programming model of the problem and solve graphically.	10	1	3																														
2.	Solve the following LPP using simplex method: Maximize $Z = 4x_1 + 10x_2$ Subject to $2x_1 + x_2 \leq 50$; $2x_1 + 5x_2 \leq 100$; $2x_1 + 3x_2 \leq 90$; $x_1, x_2 \geq 0$	10	1	3																														
3.	Solve the following LPP using Big-M method: Maximize $Z = 3x_1 - x_2$ Subject to $2x_1 + x_2 \geq 2$; $x_1 + 3x_2 \leq 3$; $x_2 \leq 4$; $x_1, x_2 \geq 0$	10	1	3																														
4.	The ICARE company has three plants located throughout a state with production capacity 40, 25 and 35 gallons. Each day the firm must furnish its three retail shops R1, R2 and R3 with at least 30, 30 and 40 gallons respectively. The transportation costs (in ₹) are given below. <table border="1" data-bbox="367 1702 1085 1926"> <thead> <tr> <th>Company</th><th colspan="3">Retail</th><th>Supply</th></tr> <tr> <th></th><th>R1</th><th>R2</th><th>R3</th><th></th></tr> </thead> <tbody> <tr> <td>P1</td><td>8</td><td>9</td><td>7</td><td>40</td></tr> <tr> <td>P2</td><td>4</td><td>3</td><td>5</td><td>25</td></tr> <tr> <td>P3</td><td>8</td><td>5</td><td>6</td><td>35</td></tr> <tr> <td>Demand</td><td>30</td><td>30</td><td>40</td><td></td></tr> </tbody> </table> The economic problem is to distribute the available product to different retail shops in such a way so that the total transportation cost is minimum?	Company	Retail			Supply		R1	R2	R3		P1	8	9	7	40	P2	4	3	5	25	P3	8	5	6	35	Demand	30	30	40		10	2	3
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Established in the year 1984 under Section 3 of U.A. 1984

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5.	A solicitor's firm employs typist on an hourly piece-rate basis for their daily work. There are five typists for service and their charges and speeds are different. According to the contract only one job is given for one typist. Find the least cost allocation for the following data:							
	P	Q	R	S	T			
A	85	75	65	85	75	10	2	3
B	90	180	66	90	78			
C	75	66	57	75	69			
D	80	72	60	80	72			
E	76	64	56	72	68			