Graphic Era
HILL UNIVERSITY
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Mid Term (Odd) Semester Examination October 2024

Roll no. 2292104

Name of the Course and semester: BCA, Vth semester
Name of the Paper: Optimization Techniques
Paper Code: TBC 503
Time: 1.5hour

Maximum Marks: 50

Note:
- *(i)* Answer all the questions by choosing any one of the sub questions
- *(ii)* Each question carries 10 marks.

Q1. (10Marks)
a. What do you mean by optimization techniques. Describe various features of operation research. CO1

OR

b. Discuss limitations and advantages of operation research. CO1

Q2. (10Marks)
a. Discuss two real life problems that can be solved using optimizationtechniques explaining their mathematical modelling. CO1

OR

b. Discuss the mathematical formulation of transportation problem. CO1

Q3. (10Marks)
a. Use the graphical method to solve the following LP problem.

Maximize $Z = 4x_1 + 3x_2$

Subject to the constraints

$$x_1 + x_2 \leq 10$$
$$3x_1 + 4x_2 \geq 24$$
$$x_2 \leq 5$$
$$x_1, x_2 \geq 0$$

CO2

OR

b. Use the graphical method to solve the following LP problem.

Minimize $Z = 2x_1 - x_2$

Subject to the constraints

$$x_1 - x_2 \geq 0$$
$$x_1 \geq 3$$
$$x_2 \geq 5$$
$$x_1, x_2 \geq 0$$

CO2

Q4. (10Marks)
a. Solve the following LPP using simplex method:

Maximize $Z = 3x_1 + 2x_2$

Subject to the constraints

$$x_1 + x_2 \leq 4$$
$$x_1 - x_2 \leq 2$$
$$x_1, x_2 \geq 0$$

CO2

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OR

b. A travelling salesman has to visit 5 cities. He wishes to start from a particular city, visit each city once and then return to his starting point. The travelling cost of each city from a particular city is given below in the matrix. Find the route for the salesman that minimizes the total cost.

City	A	B	C	D	E
A	∞	2	5	7	1
B	6	∞	3	8	2
C	8	7	∞	4	7
D	12	4	6	∞	5
E	1	3	2	8	∞

CO2

Q5.   (10Marks)

a. Find initial basic feasible solution of the following transportation problem using Vogel's approximation method.

		Warehouse			
		W1	W2	W3	Supply
Plant	F1	25	17	25	300
	F2	15	10	18	500
Demand		300	300	500	

CO2

OR

b. Solve the following assignment problem. Cost of assigning different jobs to different machines are given below:

		Machines			
		M1	M2	M3	M4
Jobs	A	8	26	17	11
	B	13	28	4	26
	C	38	19	18	15
	D	19	26	24	10

CO2