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Code No. : 14128 (D)

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. (CBCS) IV-Semester Main Examinations, January-2021.**

**Optimization Methods**

(Open Elective-II)

Time: 2 hours

Max. Marks: 60

*Note: Answer any NINE questions from Part-A and any THREE from Part-B*

**Part-A (9 × 2 = 18 Marks)**

Q. No.	Stem of the question	M	L	CO	PO
1.	Define Optimization.	2	1	1	1
2.	What is degeneracy in simplex method?	2	2	1	1
3.	Explain the necessity of sensitivity analysis.	2	2	2	2
4.	What is unbounded solution in LPP?	2	2	2	1
5.	What is unbalanced transportation?	2	1	3	1
6.	Define (a) activity (b) event in project management.	2	1	3	11
7.	Write the difference between linear and nonlinear programming.	2	1	4	1
8.	Show relatively local minima and global minima with figure.	2	2	4	1
9.	Classify non linear programming problems with multi variables.	2	1	4	1
10.	Differentiate single variable and multi variable NLPP.	2	2	4	1
11.	Is graphical method being applicable for more than 3 variables? Justify	2	2	1	1
12.	Give the conditions when to select dual simplex method for the given problem.	2	2	2	1
<b>Part-B (3 × 14 = 42 Marks)</b>					
13. a)	Solve using simplex method Max $z = 4 X_1 + 3 X_2$ subjected to condition $2 X_1 + X_2 \leq 72$ $X_1 + 2 X_2 \leq 48$ $X_1, X_2 \geq 0$	10	3	1	4
b)	Differentiate Graphical and simplex method	4	2	1	1
14. a)	Solve the following L.P.P by dual simplex method. Minimize $Z = 3X_1 + X_2$ Subjected to conditions: $4X_1 + 6X_2 \geq 4$ $2X_1 + 2X_2 \geq 2$ $X_1, X_2, \geq 0$	12	4	2	4
b)	List out the special cases of Linear Programming problems.	2	1	2	1

Contd... 2

15. a)	A company has three plant locations A, B & C which supply to warehouse located at D, E, F, G and H. Monthly plant capacities are 800, 500 and 900 units respectively.	10	4	3	5																								
	Monthly warehouse requirements are 400, 400, 500, 400 and 800 units respectively unit transportation costs (in Rupees) is given below																												
	<table border="1"> <tr> <td></td> <td>D</td> <td>E</td> <td>F</td> <td>G</td> <td>H</td> </tr> <tr> <td>A</td> <td>5</td> <td>8</td> <td>6</td> <td>6</td> <td>3</td> </tr> <tr> <td>B</td> <td>4</td> <td>7</td> <td>7</td> <td>6</td> <td>5</td> </tr> <tr> <td>C</td> <td>8</td> <td>4</td> <td>6</td> <td>6</td> <td>4</td> </tr> </table>		D	E	F	G	H	A	5	8	6	6	3	B	4	7	7	6	5	C	8	4	6	6	4				
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A	5	8	6	6	3																								
B	4	7	7	6	5																								
C	8	4	6	6	4																								
	Determine an optimum distribution for the company in order to minimize the total transportation cost.																												
b)	Explain the rules to draw network diagram.	4	1	3	11																								
16. a)	Minimize $f(x) = X^2 + (\frac{54}{x})$ in the interval (0,5) using Exhaustive search method.	10	4	4	2																								
b)	Explain unimodal function.	4	1	4	1																								
17. a)	Minimize $f(x_1, x_2) = 4x_1^2 - 5x_1x_2 + 3x_2^2 - 8x_1$ with starting point (0,0) and step length 0.01.	10	3	4	2																								
b)	Classify direct search methods of non-linear programming problems for multivariable.	4	1	4	1																								
18. a)	Solve the following L.P.P. by graphical method.	7	2	1	1																								
	Maximize $Z = 3X_1 + 2X_2$																												
	Subjected to conditions:																												
	$2X_1 + X_2 \leq 1$																												
	$3X_1 + 4X_2 \geq 4$																												
	$X_1, X_2 \geq 0$																												
b)	Explain Sensitivity Analysis with example.	7	2	2	4																								
19.	Answer any <i>two</i> of the following:																												
a)	Differentiate CPM and PERT.	7	2	3	1																								
b)	Explain the differences between Newton and Quasi Newton methods.	7	2	4	1																								
c)	Classify Random search methods and explain any one of them.	7	2	4	1																								

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60
2	Knowledge on application and analysis (Level-3 & 4)	40
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	0

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