VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD B.E. (Mech. Engg. : CBCS) VI-Semester Main Examinations, January-2021 Operations Research

(Elective-I)

Time: 2 hours

Max. Marks: 60

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

Part-A $(9 \times 2 = 18 Marks)$

Q. No.	Stem of the question	M	L	CO	PO
1.	Define Basic and non-basic solution.	2	1	1	1
2.	How do you identify the degenerate solution in LPP by using simplex method?	2	1	1	1
3.	Differentiate between simplex and dual simplex method.	2	1	2	1
4.	Write the dual form for the following L.P.P	2	3	2	2
	Maximize $z = 6x_1 + 10x_2 + 13x_3$				
	subjected to conditions $3x_1 + 4x_2 + x_3 \ge 9$ $2x_2 + 4x_3 \le 8$ $x_1, x_2, x_3 \ge 0$				
5.	How to solve an unbalanced transportation problem?	2	1	3	1
6.	With reference to Transportation problem what is non degenerate BFS?	2	2	3	1
7.	Explain the role of PWF in replacement problem	2	3	4	1
8.	Describe the calculus method of solving a 2x2 game.	2	1	4	5
9.	Define Jockeying and collusion.	2	3	5	1
10.	List various sequencing methods employed in a single machine and n jobs	2	1	5	2
11.	How do you identify a case of multiple solutions of a given LPP	2	3	1	2
12.	If a given primal problem yields unbounded solution, What shall be the dual?	2	3	2	2
	$Part-B (3 \times 14 = 42 Marks)$	=nn			
13.	Solve the following LPP by simplex method	14	2	. 1	2
	Maximize $Z=5X_1+8X_2$, subject to the constraints:				
	$3X_1+2X_2 \ge 3$,				
	$X_1+4X_2\geq 4,$				
	$X_1+X_2 \le 5$				
	and $X_1, X_2, \geq 0$				

		Write the dual of the following problem and then solve it by dual simplex method								14	4	2	2	_			
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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)	65
2	Knowledge on application and analysis (Level-3 & 4)	35
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	-