Reg.No. | | | | | | | | | | | |

D.K.M.COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1

SEMESTER EXAMINATIONS

APRIL – 2017 15CCA4A

RESOURCE MANAGEMENT TECHNIQUES

Time : 3 Hrs **Max. Marks : 75**

SECTION-A (10 x 2 = 20)

Answer ALL questions.

1. *Define Operations Research.*
2. *Define Modeling.*
3. *Define Slack Variable.*
4. *Define Surplus Variable.*
5. *What is Assignment Problem?*
6. *What is Duality?*
7. *Write the mathematical formulation of transportation problem.*
8. *Explain Transportation Problem.*
9. *What is Saddle Point?*
10. *What is two person zero sum game?*

SECTION-B (5 x 5 = 25)

Answer any FIVE of the following questions.

11. *Write the characteristics of operation research.*

12. *Solve graphically*

Maximize $Z = 4x_1 + 3x_2.$

Subject to constraints

$$2x_1 + x_2 \leq 100,$$
$$x_1 + x_2 \leq 800,$$
$$0 \leq x_1 \leq 400,$$
$$0 \leq x_2 \leq 700.$$

13. *Construct the dual of the problem,*

Maximize $Z = 3x_1 + 17x_2 + 19x_3.$

Subject to constraints

$$x_1 - x_2 + x_3 \geq 3,$$
$$-3x_1 + 2x_3 \leq 1,$$
$$2x_1 + x_2 - 5x_3 \leq 1,$$

where $x_1, x_2, x_3 \geq 0.$

14. *Solve by using simplex method,*

Maximize $Z = 5x_1 + 3x_2.$

Subject to constraints

$$x_1 + x_2 \leq 2,$$
$$5x_1 + 2x_2 \leq 10,$$
$$3x_1 + 8x_2 \leq 12,$$

where $x_1, x_2 \geq 0.$

15. *Find the minimum value of the following assignment problem.*

	I	***II***	***III***	***IV***	***V***
I	*11*	*17*	*8*	*16*	*20*
II	*9*	*7*	*12*	*6*	*15*
III	*13*	*16*	*15*	*12*	*16*
IV	*21*	*24*	*17*	*28*	*26*
V	*14*	*10*	*12*	*11*	*15*

16. Solve by using dominance property.

		B		
A	8	10	9	14
	10	11	8	12
	13	12	14	13

17. Solve by using north west corner method.

	1	2	3	4	Supply
6	2	3	11	7	6
1	1	0	6	1	1
10	5	8	15	9	10
Demand	7	5	3	2	

18. Find the optimal assignment schedule.

		Jobs				
		A	B	C	D	E
Machines	M1	4	6	10	5	6
	M2	7	4	-	5	4
	M3	-	6	9	6	2
	M4	9	3	7	2	3

SECTION-C (3 x 10 = 30)

Answer ALL questions.

19. (a) Solve by using big – M method.

Max $Z = 3x_1 - x_2.$

Subject to $2x_1 + x_2 \leq 2,$

$x_1 + 3x_2 \geq 3,$

$x_2 \leq 4.$

(Or)

(b) Write the scope of operations research.

20. (a) Solve the following problem by using

(i) Least cost method,

(ii) Vogels approximation method.

		Destination					
		D1	D2	D3	D4	D5	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

(Or)

(b) Solve the following game using graphical method,

	B1	B2
A1	-6	7
A2	4	-5
A3	-1	-2
A4	-2	5
A5	7	-6

21. (a) Solve the following game $\begin{bmatrix} 3 & -2 \\ -2 & 5 \end{bmatrix}$.

(Or)

(b) Solve the L.P.P by using simplex method

Max $Z = 3x_1 + 4x_2.$

Subject to $x_1 + x_2 \leq 450,$

$2x_1 + x_2 \leq 600,$

Where $x_1, x_2 \geq 0.$

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