LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.B.A. DEGREE EXAMINATION – **BUSINESS ADMINISTRATION**

FOURTH SEMESTER – **APRIL 2022**

UBU 4501 – OPERATIONS RESEARCH

Date: 16-06-2022 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART - A

Answer All the Questions: **(10*2=20 Marks)**

1. What is Operation Research ?
2. What are the limitations of an O.R. Model?
3. Define LPP.
4. What are the applications of LPP?
5. Define Transportation Problem.
6. What is the purpose of MODI method?
7. Define an Assignement Problem.
8. What is a Network ?
9. State the rule of Dominance.
10. Define two person Zero sum Game.

PART – B

Answer any FOUR Questions: **(4*10=40 Marks)**

11. What are the Applications of Operation Research?
12. Solve the following LPP Graphically.

    Maximize $Z = 100x_1 + 40x_2$

    Subject to $5x_1 + 2x_2 \leq 1000$

    $3x_1 + 2x_2 \leq 900$

    $X1 + 2x_2 \leq 500$

    and $x_1, x_2 \geq 0$
13. Explain an algorithm for solving a transportation Problem.
14. Determine basic feasible solution to the following transportation problem using North West Corner Rule :

Orign	Sink						Supply
		A	B	C	D	E	
	P	2	11	10	3	7	4
	Q	1	4	7	2	1	8
	R	3	9	4	8	12	9
Demand		3	3	4	5	6	

15. Explain the Importance of PERT and CPM.

16. Solve the game whose pay of matrix is given below

-2	0	0	5	3
3	2	1	2	2
-4	-3	0	-2	6
5	3	-4	2	-6

17. Explain the terms :

    (a) Pay off matrix

    (b) Pure and mixed strategies

    (c) Dominance property

PART – C

Answer any TWO Questions: **(2*20=40 Marks)**

18. A firm manufactures two types of products A and B and sells them at a profit of Rs.2 on type A and Rs. 3 on type B. Each product is processed on two machines M_1 and M_2. Type A requires 1 minute of processing time on M_1 and 2 minutes on M_2. Type B requires 1 minute on M_1 and 1 minute on M_2. Machine M_1 is available for not more than 6 hours 40 minutes while machine M_2 is available for 10 hours during any working day. Formulate the problem as a LPP so as Maximize the profit.

19. Use simplex method to solve the LPP

    Maximize = $4x_1 + 10x_2$

    Subject to $2x_1 + x_2 \leq 50$

    $2x_1 + 5x_2 \leq 100$

    $2x_1 + 3x_2 \leq 90$

    and $x_1, x_2 \geq 0$

20. The Consider the following assigning five jobs to five persons. The assignment cost are given as follows :

		Jobs				
		J1	**J2**	**J3**	**J4**	**J5**
Person	**A**	8	4	2	6	1
	B	0	9	5	5	4
	C	3	8	9	2	6
	D	4	3	1	0	3
	E	9	5	8	9	5

21. Solve the following Game theory using Dominance property:

		Player B			
		B1	**B2**	**B3**	**B4**
Player A	**A1**	5	-10	9	0
	A2	6	7	8	1
	A3	8	7	15	1
	A4	3	4	-1	4

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