3/36

2103N1680

Candidate's Seat No : _____

Integ. LLB Semester-3 Examination

IL BBA-202

Operational Research & QT

March-2024

Time : 2-30 Hours] **[Max. Marks : 70**

S. NO | QUESTIONS | MARKS

Q.1 Naznin is the senior Manager in one of the dance institute. She has to plan to transport all necessary inventory which will be used in the show at different places. The following schedule of unit transportation cost for transporting inventory from four dance centers D_1, D_2, D_3 and D_4 to Three auditoriums A_1,A_2, and A_3 is given below. Find an initial feasible solution by Using VAM Method and find Optimum solution also. 18

	D_1	D_2	D_3	D_4	Capacity(tons)
A_1	7	12	7	9	120
A_2	10	9	3	5	100
A_3	5	4	11	7	110
Requirements(tons)	90	50	80	60	330 / 280

OR

Q.1 A What is O.R.? Discuss techniques and tools in O.R. 10

Q.1 B Solve the following Game using dominance property 08

	PLAYER 2				
PLAYER 1	**13**	**15**	**14**	**19**	**16**
	15	**16**	**13**	**17**	**18**
	18	**17**	**19**	**18**	**17**
	14	**14**	**18**	**15**	**13**

Q.2 A project has the following time schedule. Draw PERT Diagram and decide CPM and find total project duration. Determine total, free and independent float. 18

Activity	Duration
1-2	4
2-3	6
2-4	10
3-5	8
3-6	2
4-6	12

P.T.O

4-7	4
5-8	16
6-8	14
7-8	8
8-9	6

OR

Q.2 A What are assignment problems?. Explain briefly its assumptions. 8

Q.2 B Following is the profit matrix for a small machine shop. Solve the given problem by using assignment method to maximize the profit. 10

Mechanic	Job				
	A	B	C	D	E
1	12	18	20	8	20
2	20	4	8	1	16
3	21	7	13	10	17
4	2	18	21	16	16
5	9	13	20	15	19

Q.3 United fabricators makes two types of automobiles parts say 'A' and 'B'. it buys casting that are to be machined, bored and polished. The capacity of machining is 25 per hour for 'A' and 40 per hour for 'B', capacity of boring is 28 per hour 'A' and 35 per hour for 'B' and the capacity for polishing in 35 per hour for 'A' and 25 per hour for 'B'. Casting for part 'A' costs₹ 2 each and for 'B' the cost is ₹ 3 each. They sell for ₹ 5 and ₹6 respectively. The three machines have running costs of ₹20, ₹14 and ₹ 17.5 per hour. Assuming that any combination of parts 'A' and 'B' can be sold, that production mix maximizes the profit? 18

Formulate it is a linear programming problem and solve it graphically.

OR

Q.3 A For the following data find EST, EFT, LFT and LST for the activity schedule given below. Also find critical path and project duration. Verify critical path with the help of total float. 10

Activity	1-2	2-3	2-4	3-5	3-6	4-7	4-8	5-10	6-11	7-9	8-9	9-11	10-11
Duration (Months:	10	9	7	6	1	6	8	4	5	8	1	11	7

Q.3 B Solve the following transportation problem using Least Cost Method. 08

		Market			
		X	Y	Z	Supply
Plants	A	5	2	8	150
	B	4	3	5	150
Demand	C	2	4	-	200
	D	6	3	4	250
		250	200	175	

Q.4 A Short Notes (Any Two) 10

1) Application of O R in various fields.
2) Limitations of O R..
3) Degeneracy in Transportation Problem.
4) Saddle point in Game Theory

Q.4 B Answer the following 06

1. All dummy rows and columns in the assignment problem is assumed to be zero.. (True/False)
2. Linear Programming was introduced for ____ in the year _____.
3. Any two uses of Linear programming problem.
4. PERT was developed by _____ while CPM was developed by _____.
5. In PERT completion activity is called node. (True/False)
6. If all the elements of a particular row are _____ the corresponding elements of any other row, then that row is dominated by other row.