



Reg. No. :

Name :

**Third Semester B.B.A. LL.B. (Five Year Integrated) Degree
Examination, May 2017
Paper – III : OPERATIONS RESEARCH**

Time : 3 Hours

Max. Marks : 80

I. Answer **any five** of the following. **Each** carries **2** marks.

- 1) What do you mean by feasible solution ?
- 2) What is symmetric matrix ?
- 3) Explain the meaning of critical path.
- 4) What is optimal solution in transportation problem ?
- 5) What is pay off matrix ?
- 6) Define sequencing problem.
- 7) What is dominance ?
- 8) What is key element ?

(5×2=10 Marks)II. Answer **any four** of the following. **Each** carries **4** marks.

- 1) Explain the different time estimate in PERT.
- 2) State the assumptions for a competitive game.
- 3) Draw the network for the project whose activities and their predecessors are given below :

Activity	A	B	C	D	E	F	G
Predecessors	None	A	A	B, C	C	D	E, F

- 4) What are the applications of Linear Programming ?
- 5) Explain the applications of OR in Accounting field.
- 6) Distinguish between balanced and unbalanced transportation problem.

(4×4=16 Marks)

P.T.O.



III. Answer **any four** of the following. **Each** carries **6** marks.

- 1) Explain the main phases of Operations Research.
- 2) Explain the procedure of determining critical path.
- 3) A milk plant is considering replacement of a machine whose cost price is Rs. 12,200 and the scrap value Rs. 200. The running (maintenance and operating) costs in Rs. are found from experience to be as follows :

Year	:	1	2	3	4	5	6	7	8
Running Cost :		200	500	800	1,200	1,800	2,500	3,200	4,000

When should the machine be replaced ?

- 4) A firm makes two products – tables and chairs, which must be processed through assembly and finishing departments. Assembly and finishing departments are having 60 hours and 48 hours respectively. Assembly department have to engage 4 hours/table and 2 hours/chairs and finishing department have to engage 2 hours/table and 4 hours/chairs. If profit is Rs. 8 per table and Rs. 6 per chair, determine the best possible combination of tables and chairs to produce and sell in order to realize the maximum profit.
- 5) Solve the following game

Player B Strategies

		I	II	III	IV
Player A Strategies	1	1	-6	8	4
	2	3	-7	2	-8
	3	5	-5	-1	0
	4	3	-4	5	7

- 6) Explain VAM in connection with transportation problem. **(4×6=24 Marks)**



IV. Answer any three of the following. Each carries 10 marks.

- 1) There are five jobs (namely 1, 2, 3, 4 and 5), each of which must go through machines A, B and C in the order ABC. Processing Time (in hours) are given below :

Jobs	1	2	3	4	5
Machine A	5	7	6	9	5
Machine B	2	1	4	5	3
Machine C	3	7	5	6	7

Find the sequence that minimum the total elapsed time required to complete the jobs.

- 2) Six salesmen are to be allocated to six sales regions so that the cost of allocation of the job will be minimum. Each salesmen in capable of doing the job at different cost in each region. The cost matrix is given below :

Region	Salesmen					
	I	II	III	IV	V	VI
A	15	35	0	25	10	45
B	40	5	45	20	15	20
C	25	60	10	65	25	10
D	25	20	35	10	25	60
E	30	70	40	5	40	50
F	10	25	30	40	50	15

Find the allocation to give minimum cost. What is this cost ?



- 3) The products of two plants A and B are to be transported to 3 warehouses W1, W2 and W3. The cost of transportation of each unit from plant to the warehouses indicated below :

Plants	Warehouses			Capacities
	W1	W2	W3	
A	25	17	25	300
B	15	10	18	500
Demand	300	300	500	800/1100

Solve the transportation problem.

- 4) Solve the following equation by using matrix

$$5x - 6y + 4z = 15$$

$$7x + 4y - 3z = 19$$

$$2x + y + 6z = 46$$

- 5) What is a float ? What are the different types of floats ? Explain. (3×10=30 Marks)

	I	II	III	IV	V	VI
A	15	35	0	25	10	45
B	40	5	45	20	15	20
C	25	60	10	65	25	10
D	25	20	35	10	25	60
E	30	70	40	5	40	60
F	10	25	30	40	50	15