Name **26P272**

Reg. No .....

M. COM DEGREE END SEMESTER EXAMINATION - APRIL 2026

SEMESTER 2 : COMMERCE

COURSE : **24P2COMT10 : OPERATIONS MANAGEMENT TECHNIQUES**

(For Regular 2025 Admission and Improvement/Supplementary 2024 Admission)

Time : Three Hours Max. Weights: 30

PART A

Answer any 8 questions **Weight: 1**

1. Mention any two practical purpose of LPP. (U)
2. What is Linear Programing Problem? (U)
3. What are travelling salesmen problems? (U)
4. Define Management Science. (R)
5. What are optimistic, pessimistic and normal time estimates in PERT calculations? (U)
6. When is the solution to a LPP infeasible? (A)
7. When can dual simplex table be applied? (A)
8. What is Probabilistic model? (R)
9. What is a mixed strategy? (U)
10. What is meant by pay off? (U)

(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11. Find the initial feasible solution to the transportation problem by lowest cost entry method. (A)

	W1	W2	W3	
F1	2	7	4	**5**
F2	3	3	1	**8**
F3	5	4	7	**7**
F4	1	6	2	**14**
	7	**9**	**18**	

12. What are the limitations of graphical method of solving a LPP? (A)
13. Given the pay off matrix for player A, obtain the optimum strategies for both the players and determine the value of the game. (A)

	Player B		
Player A	6	-3	7
	-3	0	4

14. Explain the use of O.R. in management? (U)

15. The activities involved in the computer installation process are detailed below. You are required to draw the network.

Activity	Predecessor activities
A (Physical preparation)	none
B (Organisational planning)	none
C (Personnel selection)	B
D (Equioment installation)	A
E (Personnel training)	C
F (Detailed system design)	C
G (File conversion)	F
H (Establishing standards and controls)	F
I (Programme preparation)	H
J (Parallel testing)	I
K (Parallel operations)	D,E,G,J
L (Finalise system)	I
M (Follow up)	K,L

(A)

16. A company produces two types of cow boy hats. Each hat of the first type requires twice as much labour time as the second type. If all hats are of the second type only, the company can produce a total of 500 hats a day. The market limits daily sales of the first and second types to 150 and 250 hats. Assuming that the profit per hat are Rs. 8 for type I and Rs 5 for type 2, formulate the problem as a linear programming model in order to determine the number of hats to be produced of each type so as to maximize the profit. (A)

17. What are the unbalanced assignment problems? How are they solved? (A)

18. A chemical company produces two compounds A and B. The following table gives the units of ingredients C and D per kg of compounds A & B as well as minimum requirements of C&D and cost per kg of A&B. Using the simplex method find the quantities of A&B which would give a supply of C&D at minimum cost.

		Compound		Minimum Requirement
		A	B	
Ingredient	C	1	2	80
	D	3	1	75
Cost per Kg		4	6	

(A)

(2 x 6 = 12)

PART C

Answer any 2 questions **Weights: 5**

19. For a small project consisting of eight activities estimates are given below. (A)

Activity	Estimated duration (weeks)		
	Pessimistic	Most likely	Optimistic
1 to 2	21	7.5	3
1 to 3	27	8	3
2 to 4	8	8	8
2 to 5	3.5	2	0.5
3 to 5	10	10	10
4 to 5	1.7	1	0.3
4 to 6	9	7.5	3
5 to 6	5	3	1

a) Draw the project network and identify all paths through it.
b) What is the expected project completion time.
c) Find the approximate probability of completing the project no more than 4 weeks later than expected.
d) Find the due date if there is 90% chance to meet this date.

20. A firm is planning to develop and market a new drug. The cost of extensive research to develop the drug has been estimated at Rs. 100000. The manager of the research programme has found that there is a 60% chance that the drug will be developed successfully. The market potential has been assessed as follows:

Market condition	Prob.	Present value of profit (Rs)
Large Market potential	0.1	50,000
Moderate Market potential	0.6	25,000
Low Market potential	0.3	10,000

(A)

The present value figures do not include the cost of research. While the firm is considering this proposal, a second proposal almost similar comes up for consideration. The second one also requires an investment of Rs 1,00,000 but the present value of all profits is Rs 12,000. The return on investment in the second proposal is certain.

(i) Draw a decision tree indicating all events and choices of the firm.
(ii) What decision should the firm take regarding the investment of Rs 1,00,000?

21. A company manufactures two products P_1 and P_2. The company has two types of machines A and B. Product P_1 takes 2 hours on machine A and 4 hours on machine B, whereas product P_2 takes 5 hours on machine A and 2 hours on machine B. The profit realized on the sale of one unit of product P_1 is ₹. 3 and that of Product P_2 is ₹. 4. If machine A and B can operate 24 hours and 16 hours per day respectively, determine the weekly output for each product in order to maximize the profit. (Assume 5 day week). Solve using simplex method. (A)

22. In the modification of a plant layout of a factory four new machines 1, 2, 3and 4 are to be installed in a machine shop. There are five vacant places A,B,C,D and E available. Because of limited space machine 2 cannot be placed at C and 3 cannot be placed at A. The cost of locating places to machines is given below. Find the optimal assignment schedule which space remain vacant after assignment.

	Vaccancies				
Machines	A	B	C	D	E
1	9	11	15	10	11
2	12	9	-	10	9
3	-	11	14	11	7
4	14	8	12	7	8

(An)

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;