

M. COM DEGREE END SEMESTER EXAMINATION : MARCH 2023**SEMESTER 2 : COMMERCE****COURSE : 21P2COMT10 : OPERATIONS MANAGEMENT TECHNIQUES***(For Regular - 2022 Admission and Supplementary - 2021 Admission)*

Duration : Three Hours

Max. Weights: 30

PART A**Answer any 8 questions****Weight: 1**

1. What is Expected Monetary Value (EMV)? (U, CO 4)
 2. What are optimistic, pessimistic and normal time estimates in PERT calculations? (U, CO 5)
 3. What is Probabilistic model? (R, CO 1)
 4. What is float? (R, CO 5)
 5. How degeneration occurs in transportation problem? (R)
 6. State whether the following game matrix has a saddle point

1	0
-4	3

 (An, CO 4)
 7. What is forward pass in CPM? (U, CO 5)
 8. Mention any two practical purpose of LPP (U)
 9. What is queuing theory? (U, CO 4)
 10. When is the solution to a LPP infeasible? (A, CO 2)
- (1 x 8 = 8)**

PART B**Answer any 6 questions****Weights: 2**

11. Outline the phases of a Systematic O.R (An, CO 1)
12. Draw network diagram $A < C, D$; $B < C, D$; $C < E$; $D, E < F$ (An, CO 5)
13. Explain how dual is formed for a given primal. (U, CO 2)
14. What are unbalanced transportation problems? How are they solved? (A, CO 3)
15. A and B play a game as follows.
The simultaneously and independently, write one of the three numbers 1,2,3. If the sum of the numbers written is even, B pays to A this sum in rupees. If it is odd, A pays the sum to B in rupees. Form the matrix of the game for A and solve it. (A, CO 4)
16. A home resourceful decorator manufactures two types of Lamps say A and B. Both lamps go through two manufactures first a cutter and second a finisher. Lamp A requires 2 hours of the cutter's and 2 hours of finisher's time. The cutter has 104 hours and finisher has 76 hours of available time each month. Profit on the Lamp A is Rs. 6 and on one B Lamp is Rs. 11. Formulate a mathematical model. (A, CO 2)
17. Hindustan construction company needs 3,3,4 and 5 million cubic feet of fill at four earthen dam sites in Punjab. It can transfer the fill from three mounds A,B and C where 2,6 and 7 million cubic feet of fill is available respectively. Costs of transporting one million cubic feet of fill from mound (An, CO 3)

to the four sites in lakhs are:

	1	2	3	4
A	15	10	17	18
B	16	13	12	13
C	12	17	20	11

Formulate the problem as LLP.

18. Find which Act is optimal A or B

A		B	
Pay off	Probability	Pay off	Probability
12	0.5	10	0.4
15	0.2	20	0.3
20	0.3	20	0.3

(A, CO 4)

(2 x 6 = 12)

PART C

Answer any 2 questions

Weights: 5

19. Solve the following Linear Programming Problems by Simplex Method.

Max. $Z = 25X_1 + 20X_2$

S.t. $16X_1 + 12X_2 \leq 100$

$8X_1 + 16X_2 \leq 80$

$X_1, X_2, \geq 0$

(A, CO 2)

20. A grocery store with a bakery department is faced with the problem of how many cakes to buy in order to meet the day's demand. The grocer prefers not to sell day-old goods in competition with fresh products. Leftover cakes are, therefore, a complete loss. On the other hand, if a customer desires a cake and all of them have been sold, the disappointed customer will buy elsewhere and the sales will be lost. The grocer has, therefore collected information on the past sales in a selected 100-day period as shown in the following table:

Sales per day	No. of days	Probability
25	10	0.1
26	30	0.3
27	50	0.5
28	10	0.1
	100	1

(A, CO 4)

Construct the pay-off table and the opportunity loss table. What is the optimal number of cakes that should be bought each day? Apply both EMV and EOL criteria. Also find (and interpret) EVPI (Expected Value of Perfect Information). A cake costs Rs 0.80 and sells for Re 1.

21. The following is the unit cost matrix of a transportation problem. Use Modi method to obtain the optimum basic feasible solution.

	1	2	3	available
A	50	30	220	1
B	90	45	170	3
C	250	200	50	4
required	4	2	2	

(A, CO 3)

(U, CO 5)

22. What are the main steps in the application of network techniques?

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	To understand the meaning and evolution of Operations Management Techniques	U	3, 11	3
CO 2	To understand the concept of Linear Programming and its application for business solution.	A	10, 13, 16, 19	10
CO 3	To learn the transportation and assignment techniques for business application	A	14, 17, 21	9
CO 4	To understand the decision theory and quantitative approach to managerial decision making.	An	1, 6, 9, 15, 18, 20	12
CO 5	To learn the techniques of Networking and different types of Networking.	A	2, 4, 7, 12, 22	10

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