TM251748H

Reg. No :31/10/25

Name :.....

MASTER'S DEGREE (C.S.S) EXAMINATION, OCTOBER 2025

2025 ADMISSIONS REGULAR

SEMESTER I - CORE COURSE (COMMERCE)

CM1C04TM25 - Management Optimisation Techniques

Time : 3 Hours **Maximum Weight : 30**

Part A

Answer any 1 question from the bunch of CO1. Each question carries 1 Weight. **(1x1=1)**

1. **Discuss the limitations of Operations Research.** [CO1,Understand]
2. **Discuss the application of operations research in transportation.** [CO1,Understand]

Part A

Answer any 1 question from the bunch of CO2. Each question carries 1 weight. **(1x1=1)**

3. **Describe Big M Method in LPP.** [CO2,Understand]
4. **Describe Basic Variables and Slack Variables.** [CO2,Understand]

Part A

Answer any 2 questions from the bunch of CO3. Each question carries 1 weight. **(1x2=2)**

5. **List down the basic assumptions in transportation problem.** [CO3,Understand]
6. **Cite any two areas where assignment technique is applied.** [CO3,Understand]
7. **Explain non-degenerate basic feasible solution.** [CO3,Understand]

Part A

Answer any 2 questions from the bunch of CO4. Each question carries 1 weight. **(1x2=2)**

8. **Explain fair game.** [CO4,Understand]
9. **Explain decision theory.** [CO4,Understand]
10. **Explain the terms Pay Off Matrix and Saddle point of Game theory.** [CO4,Understand]

Part A

Answer any 2 questions from the bunch of CO5. Each question carries 1 weight. **(1x2=2)**

11. **Describe CPM.** [CO5,Understand]
12. **Define an 'Event' and 'Activity' in network diagram.** [CO5,Understand]
13. **Enumerate the objectives of network analysis.** [CO5,Understand]

Part B

Answer any 2 questions from the bunch of CO3. Each question carries 2 weight. **(2x2=4)**

14. **Explain the Hungarian method for solving an Assignment problem.** [CO3,Evaluate]
15. **Find the initial feasible solution to the following transportation problem by lowest cost entry method.**

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

[CO3,Evaluate]

16. **Solve the following minimal assignment problem. How are the assignments made and find the total cost?**

		Man			
		1	2	3	4
	I	12	30	21	15
Job	II	18	33	9	31
	III	44	25	21	21
	IV	14	30	28	14

[CO3,Apply]

Part B

Answer any 2 questions from the bunch of CO4. Each question carries 2 weight. (2x2=4)

17. **Write a note on Decision Tree Analysis. Explain how it is drawn and how such analysis is useful in decision making.** [CO4,Understand]

18. **A truck owner finds from his past records that the maintenance costs per year of a truck whose purchase price is Rs 8,000 are as follows:**

Year	1	2	3	4	5	6	7	8
Maintenance cost	1000	1300	1700	2200	2900	3800	4800	6000
Resale price	4000	2000	1200	600	500	400	400	400

Determine at which time it is profitable to replace the truck. [CO4,Evaluate]

19. **A firm is considering replacement of a machine where cost price is Rs 12,200 and the scrap value is only Rs 200. The maintenance cost are found as follows:**

Year	1	2	3	4	5	6	7	8
Maintenance cost	200	500	800	1200	1800	2500	3200	4000

When should the machine be replaced? [CO4,Evaluate]

Part B

Answer any 2 questions from the bunch of CO5. Each question carries 2 weight. (2x2=4)

20. Discuss about Network Analysis. [CO5,Understand]

21. Summarize the terms Tail Event, Head Event, successor Events and Predecessor Events with an example. [CO5,Understand]

22. **Distinguish between PERT and CPM.** [CO5,Understand]

Part C

Answer any 1 question from the bunch of CO1. Each question carries 5 weight. (5x1=5)

23. **O.R renders valuable service in the field of business management. Comment.** [CO1,Understand]

24. **Outline the various characteristics of Operations Research.** [CO1,Understand]

Part C

Answer any 1 question from the bunch of CO2. Each question carries 5 weight. (5x1=5)

25. (a) Solve the LPP using simplex method:

Max $Z = 5x_1 + 3x_2$

Subject to, $x_1 + x_2 \leq 2$

$5x_1 + 2x_2 \leq 10$

$3x_1 + 8x_2 \leq 12$

$x_1, x_2 \geq 0$

[CO2,Apply]

26. Solve the following problem graphically.

Maximise $Z = 3x_1 + 4x_2$

Subject to $x1 + x_2 \leq 450$

$2x_1 + x_2 \leq 600$

$x_1, x_2 \geq 0$

[CO2,Apply]