K25U 0978

Reg. No. : .....

Name : .....

IV Semester B.Sc. Degree (C.B.C.S.S. – O.B.E. – Regular) Examination, April 2025
(2023 Admissions)
COMPLEMENTARY ELECTIVE COURSE IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
4C04 MAT-AIML : Linear Programming and Game Theory

Time : 3 Hours Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions. **Each** question carries 1 mark.

1. What is Linear Programming ?
2. Define a basic feasible solution in the context of the transportation problem.
3. What is meant by a two-person zero-sum game ?
4. Define sequencing in Operations Research.
5. What is the difference between a pure strategy and a mixed strategy in Game Theory ?
6. What does the term "loops" refer to in a transportation problem ? (6×1=6)

PART – B
(Short Essay)

Answer **any six** questions. **Each** question carries **2** marks.

7. Explain the concept of standard and canonical forms in Linear Programming.
8. Describe the role of the transportation algorithm in solving transportation problems.
9. How is a saddle point identified in Game Theory ?
10. Explain the importance of the sequencing problem in industrial applications.

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11. What are the advantages of using the graphical method in solving Linear Programming problems ?

12. Describe the Modified Dominance Property in Game Theory.

13. How does the Maximin strategy work in decision-making ?

14. What are the basic differences between a 2×2 and an n×n game ? (6×2=12)

## PART – C
## (Essay)

Answer **any four** questions. **Each** question carries 3 marks.

15. Describe the Simplex Method and its applications.

16. Explain how to determine an initial basic feasible solution using the North-West Corner method.

17. Discuss the difference between processing 'n' jobs through '2' machines and processing 'n' jobs through 'k' machines.

18. Explain the concept of graphic solutions for 2×n and m×2 games.

19. What are the main assumptions made in the transportation model ?

20. Explain the significance of Maintenance Crew Scheduling in sequencing problems. (4×3=12)

## PART – D
## (Long Essay)

Answer **any two** questions. **Each** question carries **5** marks.

21. Discuss in detail the various methods to obtain an optimal solution in transportation problems.

22. Explain the concept of the Maximin-Minimax Principle and illustrate it with an example.

23. Discuss the importance of Game Theory in real-world applications and explain its role in decision-making.

24. Compare and contrast the different methods used to solve Linear Programming problems, including graphical and algebraic methods. (2×5=10)