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**SAINTGITS COLLEGE OF APPLIED SCIENCES**

**SECOND INTERNAL ASSESSMENT EXAMINATION, MARCH 2019**

**Department of BCA, Semester 4**

**Operational Research**

Total : **80 marks** Time:**3Hours**

**Section A**

*Answer any 10 questions. Each question carries 2 marks.*

1.What is balanced transportation problem?

 2.What is an optimal solution of a L.P.P?

3.What is meant by feasible solution of a L.P.P?

4.Write the general form of the function to be minimized in a transportation problem.

5.With reference to a transportation problem, define degenerate basic feasible solution?

6.Define saddle point?

 7. For the pay off matrix $\left[\begin{matrix}1&4\\3&2\end{matrix}\right]$ , find the maxmin element?

 8. What is a zero sum game?

9.Define surplus variable

10.What is an assignment problem?

 11.What are unbalanced assignment problems? How are they solved?

12.What is the difference between a basic variable and a non-basic variable in L.P.P?

 (10x2=20 )

**Section B**

Answer any six of the following. Each question carries 5 marks.

 13. Using dominance property, obtain the optimum strategies for both the players and determine the value of the game

player B

 2 4 3 4

 Player A 5 6 3 8

 6 7 9 7

 4 2 8 3

14. Solve graphically Min z=3x+5y

Subject to -3x+4y≥12 , 2x-y≥-2, 2x+3y≥12, x≤4, y≥2

15. Find the initial basic feasible solution to the transportation problem using North West corner rule

 I II III IV

 A 2 3 11 7 **6**

 B 1 0 6 1 **1**

C 5 8 15 9 **10**

 **7 5 3 2**

16. Explain the difference between transportation problem and assignment problems.

17. Use simplex method to solve Max z=6x+4y subject to -2x+y≤2, x-y≤2, 3x+2y≤9, x, y$\geq 0$

18. What are the characteristics of a competitive game?

19. Explain MODI method for solving a transportation problem

20.Explain the theory of dominance in the solution of rectangular game.

21. Find the initial basic feasible solution to the transportation problem using column minima method

 I II III

 A 2 7 4 **5**

 B 3 3 1 **8**

C 5 4 7 **7**

D1 6 2 **14**

 **7 9 18**

 (6x5=30)

**Section C.**

Answer any two of the following.

Each question carries 15 marks

22. A batch of four jobs can be assigned to five different machines. The set up time for each job on each machine is given below. Find an optimal assignment of jobs to machines which will minimize the the total set up time.

Machines

 18 24 28 32

 8 13 17 19

 Jobs 10 15 19 22

23. Solve using Big M method Min Z=3x+8y

 Subject to x +y=200, x≤80, y$\geq 60$ x,y≥0

24. (a) Distinguish between a zero sum game and non-zero sum game.

 (b) Solve the following game

 Player B

|  |  |
| --- | --- |
|  | 1 II III IV |
| 1234 | 3 2 4 03 4 2 44 2 4 0 0 4 0 8 |

25**.** Solve the transportation problem

 A B C

1 3 5 7 150

II 6 4 10 200

III 8 10 3 100

100 300 50

(2x15=30)

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