**SAINTGITS COLLEGE OF APPLIED SCIENCES**

 **PATHAMUTTOM, KOTTAYAM**

**SECOND INTERNAL EXAMINATION, MARCH2020**

**Department of BCA, Semester IV**

**OPERATIONS RESEARCH**

Total : 80 **marks** Time: **3 hours**

**Section A**

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

1. Describe Hungarian method for solving an assignment problem.

2. What are the limitations of graphical method for solving a linear programming problem?

3. Explain assignment problems.

4. Explain briefly the term artificial variables.

5. Solve the game with the pay off matrix $\left[\begin{matrix}\begin{matrix}15&2&3\\6&5&7\\-7&4&0\end{matrix}& \\ & \end{matrix}\right]$

6. What are the assumptions made in the theory of games?

7. What are different phases of O.R?

8. Define the terms slack and surplus variables in a L.P.P

9. Distinguish between static and dynamic models.

10. Explain the advantages of a model.

11. State whether the following game matrix has a saddle point.$\left[\begin{matrix}1&0\\-4&3\end{matrix}\right]$

12. What is the role of loops in transportation problems?

 (10 x 2 = 20 Marks)

**Section B**

*Answer any 6 questions. Each question carries 5 marks.*

13. Explain the difference between transportation and assignment problems.

14.Solve the following problem graphically Min Z=3x+5y, subject to -3x+4y≥12, 2x-y≥-2, 2x+3y≥12, x$\leq 4$, y≥2, x,y≥0

15. Find the initial feasible solution to the following transportation problem by 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. 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

17. Solve the following minimal assignment problem

 2 3 4 5

 4 5 6 7

 7 8 9 8

 3 5 8 4

18. Explain Vogel’s method for solving transportation problems.

19. Explain the application of O.R

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

21. What are the characteristics of a competitive game?

(6 x 5 = 30 Marks)

**Section C**

*Answer any 2 questions. It carries 15 marks.*

22. Solve using big M method Min Z= 9x+10y, subject to x+2y≥25, 4x+3y≥24, 3x+2y≥60, x,y≥0

23. Solve the transportation problem

 4 6 8 13 ***50***

 13 11 10 8 ***70***

 14 4 10 13 ***30***

 9 11 13 8 ***50***

 ***25 35 105 20***

24. Solve the assignment problem

 **I II III IV V**

**A** 1 3 2 3 6

**B** 2 4 3 1 5

**C** 5 6 3 4 6

**D** 3 1 4 2 2

**E** 1 5 6 5 4

25. 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 |
|  |  |

Player A

(2 x 15 = 30 Marks)

*[Scan QR code for Answer Key]*