SAMPLE MCQ

**SEMESTER VI (GENERAL)**

 **DSE1B3(LINEAR PROGRAMMING))**

1. For the LPP Max Z= 2x-3y

 Subject to x+y $\leq 2$ ,2x+2y$\geq $8 ,x,y$\geq $0

(a) has a feasible region which is unbounded and no finite optimal solution

(b)feasible region is bounded and unique optimum solution

(c) feasible region is bounded and number of solution is infinite.

(d)none of the above

2.For the LPP Min Z= 5x-2y

 Subject to 2x+3y$\geq 1$ ,x,y$ \geq $ 0

Solution is

1. x=25/4 , y=0, Min Z=25/2
2. x=0,y=1/3,Min Z=-2/3
3. x=1/3,y=0, Min Z =2/3
4. x=-1/3,y=-1, Min Z =1/3

3.For the system of equations

x+2y+z=4 , 2x+y+5z=5

x=5,y=0,z=-1 is

(a)a basic solution,(b)a basic feasible solution,(c)a degenerate basic solution,(d)none of these.

4. The possible no of basic solution of a system of m equation with n unknowns (n> m) and rank of the coefficient matrix is m is

(a)n (b) $\left(\genfrac{}{}{0pt}{}{n}{m}\right) $ (c)$ \left(\genfrac{}{}{0pt}{}{n+1}{k}\right)$ (d)$ \left(\genfrac{}{}{0pt}{}{n}{m+1}\right)$

5. for the system x+y+2z= 9, 3x+2y+5z=22 , x,y,z$\geq $ 0

(2,3,2) is

1. a non-basic feasible solution
2. basic feasible solution
3. Degenerate basic solution
4. Degenarate basic feasible solution

6.The maximum number of basic solution of the system

2x+3y-z+4w=8 , x-2y+6z-7w=-3 is

(a)2 (b) 4 (c) 6 (d) 5

7. For the LPP Max Z=2x-y

Subject to x-y≤1 , x≤3 , x,y ≥0

Has a feasible region which is

(a)Unbounded and no finite optimal solution (b) unbounded and has a finite optimal solution (c) bounded and unique optimal solution (d) bounded and number of solution is infinite.

8. For the LPP

 Max Z =2x+5y

Subject to 0≤ x≤4 , 0≤y≤3 , x+y ≤6 has

(a)Unique solution x=3,y=3,z=21 (b) unique solution x=7,y=-1,z=9, (c) no solution (d) infinite number of solution.

9. The set S={(x,y): $x^{2}$+$y^{2}$ =16 } is

(a) a convex set (b) a convex hull (c) a convex polyhedron (d)none

10.For the set

S={(x,y) : IxI≤1,IyI≤1} . Extreme points are

(a)(1,1) , (1,0), (1,-1) (b)(1,1) ,(0,-1),(-1,-1) (c)(1,1),(-1,1),(-1,-1),(1,-1), (d)(1,1),(1,0),(0,1),(-1,-1)(11.For the system x+2y+z=4 ,2x+y+5z=5,

(0,5/3,2/3) is

(a) a basic solution, (b) a degenerate basic solution, (c) a non-basic feasible solution, (d) a basic feasible solution

12.If the primal problem has an unbounded objective function then the dual has

(a) unbounded solution (b) no feasible solution (c) finite optimal solution (d) infinite number of solution.

13.If any of the constraints in the primal problem be a perfect equality then the corresponding dual variable is

(a) restricted in sign (b)unrestricted in sign (c) zero (d) none of these

14.The extreme points of the set A={(x,y): $x^{2}$+$y^{2}\leq 5$} lies on

(a) a chord (b) on a diameter (c) on the circumference of the circle (d)at the centre of the circle

15.The convex hull of the set A={ (x,y): $ x^{2}$+$y^{2}=$5 } is

(a) the set itself (b) no convex hull (c) open ball $x^{2}$+$y^{2}<$ 5 (d) closed ball $x^{2}$+$y^{2}\leq $ 5

16. The number of extreme points of the set A={(x,y): $x^{2}$+$y^{2}\leq $ 1} is

(a) 1 (b) 2 (c) infinite (d) no extreme points.

17. For a LPP and its dual which one of the following is not correct

(a) the dual of the dual is primal

(b) If the primal has an unbounded objective function then the dual is infeasible

(c) If the primal is infeasible then dual has unbounded objective function

(d) If the primal has a finite optimal solution then the dual also has a finite optimal solution

18.In solving the LPP Max Z = 2x+3y+z subject to -3x+2y+3z =8, -3x +4y +2z =7,x,y,z$\geq $ 0 the standard form of objective function after introducing required variables is

(a) Max Z = 2x+3y+z+u+v,u,v slack variables

(b) Min Z = 2x+3y+z+u+v , u,v slack variables

(c) Max Z = 2x+3y+z-u-Mv , u surplus and v artificial variables

(d) Max Z = 2x+3y+z-Mu-Mv ,u and v are artificial variables

19.The set of all convex combination of 8 vertices in a cube is a

(a) convex hull but not convex polyhedron (b) convex polyhedron but not convex hull (c) hyperplane (d) convex polyhedron as well as convex hull.

20. If the optimality criterion be satisfied at any iteration and if the basis contains one or more artificial variables with positive value then the original problem has

(a) no feasible solution (b)unbounded solution (c) optimal basic feasible solution (d) alternative optima

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 **SEC 42 (Transportation and Game Theor**

1.The number of basic variables in a transportation problemwith m origins and n destinations is

(a) m+n+1 (b) m+n (c) m+n-1 (d) m

2. in a transportation problem which one is not true

(a) transportation problem is always balanced

(b) the transportation problem always has a feasible solution

(c) solution of a transportation problem can never be unbounded

(d) degeneracy can also happen in a transportation problem

3.A non-degenerate basic feasible solution to a transportation problem with m origins and n destinations will consist

(a)at least ( m+n) positive variables (b) at most (m+n) positive variables (c) at most (m+n-1) positive variables (d) at least (m+n-1) positive variables.

4. The solution of a transportation problem can never be

(a) bounded (b) unbounded (c) degenerate (d) unique

5. If in a transportation problem $\sum\_{}^{}a\_{i}<$ $\sum\_{}^{}b\_{j}$ then to solve the problem we habve to introduce

(a) a dummy row (b) a fictitious column (c) a row as well as a column (d) nothing.

6. To resolve degeneracy of a transportation problem we allocate a small quantity to

(a) one cell (b) one or more allocated cell (c) as many cells that is required to have (m+n-1) independent set of allocation (d) as many cells that is required to have (m+n-1) dependent set of allocation

7. In the North-West corner method of the transportation problem

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | $$D\_{1}$$ | $$D\_{2}$$ | $$D\_{3}$$ | $$D\_{4}$$ | $$a\_{i}$$ |
| $$O\_{1}$$ | 2 | 1 | 3 | 4 | 30 |
| $$O\_{2}$$ | 3 | 2 | 1 | 4 | 50 |
| $$O\_{3}$$ | 5 | 2 | 3 | 8 | 20 |
| $$b\_{j}$$ | 20 | 40 | 30 | 10 |  |

 The solution $x\_{11}$=20, $x\_{12}=10,$ $x\_{22}$=30,$x\_{23}$= 20, $x\_{33}$=10,$x\_{34}$=10 is

1. basic non-feasible solution (b) basic feasible solution (c) degenerate basic solution (d) degenerate basic feasible solution

8.In an assignment problem if a constant be added to any row/column of the cost matrix then the resulting assignment problem

(a) optimal solution increases by the added amount (b) optimal solution decreased by that amount (c) optimal solution remains the same and the value of the objective function unchanged (d) optimal solution remains the same and the value of the objective function changed.

9. In an assignment problem with m jobs and m facilities , number of basic variables that a basic feasible solution contains is

(a)2m-1 (b) 2m (c)m-1 (d) m+1

10.In an assignment problem which of one of the following is not true

(a) the least possible number of horizontal and vertical lines drawn to cover all the zeroes may be equal to the order of the cost matrix

(b) the least possible number of horizontal and vertical lines drawn to cover all the zeroes may be less than the order of the matrix.

(c) the least possible number of horizontal and vertical lines drawn to cover all the zeroes may be greater than the order of the matrix.

(d) the cost matrix is always a square matrix.

11. A game is said strictly determinable if

(a) maximin for maximizing player $\leq minimax $ for the minimizing player

(b) maximin for maximizing player $\geq minimax $ for the minimizing player

(c)$ minimax $ for the minimizing player = maximin for maximizing player

(d) maximin for maximizing player = 0=$ minimax $ for the minimizing player

12.For the payoff matrix

|  |  |  |  |
| --- | --- | --- | --- |
| A/B | $$B\_{1}$$ | $$B\_{2}$$ | $$B\_{3}$$ |
| $$A\_{1}$$ | -1 | -2 | 8 |
| $$A\_{2}$$ | 7 | 5 | -1 |
| $$A\_{3}$$ | 6 | 0 | 12 |

The value of the game is

1. 0 (b) -1 (c) 5 (d) -2

13. For what value of a the game with payoff matrix

|  |  |  |
| --- | --- | --- |
| A/B | I | II |
| I | 3 | 7 |
| II | -3 | a |

Is strictly determinable?

1. 0 (b) any negative integer (c) any positive integer (d) does not depend upon the value of a.

14. The value of a for which the following game

|  |  |  |  |
| --- | --- | --- | --- |
| A/B | I | II | III |
| I | a | 5 | 2 |
| II | -1 | a | -8 |
| II | -2 | 3 | a |

Is strictly determinable is

1. -1$\leq $a$\leq $ 2 (b) -1$\leq $a$\leq $ 1 (c) 1$\leq $a$\leq $ 2 (d) -2$\leq $a$\leq $ 2

15. The number of saddle point in the game

|  |  |  |  |
| --- | --- | --- | --- |
| A/B | I | II | III |
| I | 1 | 2 | 1 |
| II | 0 | -4 | -1 |
| III | 1 | 3 | -2 |

Is

(a) 1 (b)2 (c) no saddle point (d) 3

16.Which is not true in a game

(a) if mixed strategies be allowed then there always exist a value of the game

(b) in a strictly determinable game maximin for maximizing player = minimax for minimizing player

(c) for a fair game maximin for maximizing player =0= minimax for minimizing player

(d) maximin for the maximizing player = minimax for the minimizing player is a necessary condition that a game to have saddle point.

17.Optimal solution of the game

|  |  |  |
| --- | --- | --- |
| A/B | I | II |
| I | -2 | 6 |
| II | 5 | 1 |

Is

(a) A(1,0) B(0,1) (b) A(1/2,1/2)B(1/3,4/3) (c) A(1/3,2/3) B(5/12,7/12) (d) A(1/3,5/30) B(1/5,4/5)

18. The best strategy for A,the maximizing player for the following game

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A/B | $$B\_{1}$$ | $$B\_{2}$$ | $$B\_{3}$$ | $$B\_{3}$$ |
| $$A\_{1}$$ | 1 | 3 | 0 | 2 |
| $$A\_{2}$$ | 3 | 0 | 1 | -1 |

Is

1. (1/2,1/2) (b) (-1/2,-1/2) (c) (-1/2,0) (d) (3/2,1)

19.If we add a fixed number P to each element of the payoff matrix then

(a) the value of the game remains unchanged

(b) the value of the game remains unchanged and optimal strategies changed

(c) the value of the game increase by P with the optimal strategies changed

(d) the value of the game increase by P and optimal strategies remains unchanged.

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