Q1. The programming problem

Max subject to the conditions

 is:

(a) not an LPP

(b) an LPP, WI un unbounded feasible region and no solution

(c) an LPP, and Max Z= 18,

(d) an LPP, and Max Z = 12, at

Q2. The region represented by the system of inequalities and is

(a) unbounded in first quadrant

(b) unbounded in first and second quadrant

(c) bounded in first quadrant

(d) not feasible

Q3. A linear programming problem is as follows:

Maximize/minimize objective function subject to constraints.

If the corner points of feasible region are A(0, 10) B(12, 6) C(20, 0), 0(0, 0), then which of following is true.

(a) Maximum value of z is 40

(b) Minimum value of z is -5

(c) Difference of maximum and minimum values of z is 35

(d) At two corner points value of z are equal.

Q4. The value of is

(a)

(b)

(c)

(d)

Q5. Match the following column

|  |  |
| --- | --- |
| Column I | Column II |
| 1. If A be any given square matrix of order n, then
 | 1. ,
 |
| 1. A square matrix A is said to be singular
 | 1.
 |
| 1. A square matrix A is said to be non-singular
 | 1. A is non - singular matrix
 |
| 1. A square matrix A is invertible if and only if A
 | 1.
 |

(a) A→I, B→III, C→IV, D→II

(b) A→IV, B→III, C→I, D→II

(c) A→IV, B→II, C→I, D→III

(d) A→I, B→II, C→IV, D→III

Q6. If two vectors are and , then the value of is

(a)

(b)

(c)

(d)

Q7. The value of integral is

(a)

(b)

(c)

(d)

Q8. Let be a square matrix of order 4 with . If . Then, find the value of
(a) 30
(b) 63
(c) 95
(d) 150

Q9. If and are two vectors such that , what is the angle between and ?
(a) 0
(b)
(c)
(d)

Q10. Consider the differential equation:

Which of the following statements are true regarding the given differential equation?

(A) The differential equation is linear.

(B) The integrating factor of the differential equation is .

(C) The order of the differential equation is 2.

(D) The general solution can be expressed as .

Options:
(a) A and B only
(b) A, B, and D only
(c) A and D only
(d) B, C, and D only

Solutions:

S1. Ans. (c)

Sol. Given L.P.P.

 Given constraints form a rectangle.

 Corner points are

 Maximum value of

 Maximum value of z at (3, 4).

S2. Ans. (a)

Sol. Given inequalities are

 and

We have

 ………… (i)

 ………….. (ii)

 ………….. (iii)

From eq. (i) we get

From eq. (ii), we get

From eq. (iii), we get

The common region is unbounded in first quadrant.

S3. Ans. (b)

Sol. Given

 Corner points of feasible region are (0, 10), (12, 6), (20, 0) & (0, 0).

 At (0, 10) we have (Minimum)

 At (12, 6) we have

 At (20, 0) we have (Maximum)

 At (0, 0) we have

S4. Ans. (d)

Sol. We have

S5. Ans. (d)

Sol. If A be any given square matrix of order n, then

 A square matrix A is said to be singular

 A square matrix A is said to be non-singular

 A square matrix A is invertible if and only if A is non- singular matrix.

S6. Ans. (a)

Sol. We have

S7. Ans. (b)

Sol. We have

S8. Ans. (b)

Sol. Since,

On comparing

Now,

S9. Ans. (b)

Sol. We have

Squaring both sides:

Since , and neither vector is null, we get

S10. Ans. (a)

Sol. (A) The given equation can be rewritten in the standard linear form:

So, the equation is first-order linear.

(B) The integrating factor (IF) is:

Hence, .

(C) The highest derivative present is dy/dx, so the order is 1, not 2.

(D) Given differential equation can be written as

Solution is

Option (D) is not correct.