MATHS

BOOKS - NIKITA MATHS (HINGLISH)

LINE

MULTIPLE CHOICE QUESTIONS

1. Lines $\vec{r} = \vec{a}_1 + \lambda \vec{b}_1$ and $\vec{r} = \vec{a}_2 + s\vec{b}_2$ will lie in a Plane if

A. $\left| \frac{\left(\vec{b}_1 \times \vec{b}_2\right) \times \left(\vec{a}_2 - \vec{a}_1\right)}{\vec{b}_1 \times \vec{b}_2} \right|$

B. $\left| \frac{\left(\vec{a}_2 \times \vec{a}_1\right) \times \left(\vec{b}_2 - \vec{b}_1\right)}{\vec{b}_1 \times \vec{b}_2} \right|$

C. $\left| \frac{\left(\vec{a}_2 \times \vec{a}_1\right) . \left(\vec{b}_2 - \vec{b}_1\right)}{\vec{b}_1 \times \vec{b}_2} \right|$

D. $\left|\frac{\left(\vec{a}_2 \times \vec{a}_1\right).\left(\vec{b}_2 - \vec{b}_1\right)}{\vec{b}_1 \times \vec{b}_2}\right|$

Answer: C

Watch Video Solution

2. The equation of X-axis is of the form

A. $\frac{x}{1} = \frac{y}{0} = \frac{z}{0}$

B. $\frac{x}{0} = \frac{y}{1} = \frac{z}{1}$

C. $\frac{x}{1} = \frac{y}{1} = \frac{z}{1}$

D. $\frac{x}{0} = \frac{y}{0} = \frac{z}{1}$

Answer: A

Watch Video Solution

3. The equation of a line passing through (a, b, c)

and parallel tp z-axis is

A. $\frac{x-a}{1}=\frac{y-b}{1}=\frac{z-c}{0}$

B. $\frac{x-a}{0}=\frac{y-b}{0}=\frac{z-c}{1}$

C. $\frac{x-a}{0}=\frac{y-b}{1}=\frac{z-c}{0}$

D. $\frac{x-a}{1}=\frac{y-b}{0}=\frac{z-c}{1}$

Answer: B

Watch Video Solution

4. A symmetrical form of the line of intersection of the planes $x=ay+b$

and $z=cy+d$ is

A. $\frac{x-b}{a}=\frac{y}{1}=\frac{z-d}{c}$

B. $\frac{x-b}{a}=\frac{y}{b}=\frac{z-d}{c}$

C. $\frac{x-a}{b}=\frac{y}{1}=\frac{z-c}{d}$

D. $\frac{x+a}{b} = \frac{y}{1} = \frac{z+c}{d}$

Answer: A

Watch Video Solution

5. The equation of a line passing through the point (4,-2,5) and parallel to the vector $3\hat{i} - \hat{j} + 2\hat{k}$ is

A. $\left(4\hat{i} - 2\hat{j} + 5\hat{k}\right) + \lambda\left(2\hat{i} - \hat{j} + 3\hat{k}\right)$

B. $\left(4\hat{i} - 2\hat{j} + 5\hat{k}\right) + \lambda\left(\hat{i} - 2\hat{j} + 3\hat{k}\right)$

C. $\left(4\hat{i} - 2\hat{j} - 5\hat{k}\right) + \lambda\left(3\hat{i} - \hat{j} - 2\hat{k}\right)$

D. $\left(4\hat{i} - 2\hat{j} + 5\hat{k}\right) + \lambda\left(3\hat{i} - \hat{j} + 2\hat{k}\right)$

Answer: D

Watch Video Solution

6. The cartesian equation of a line passing through the point (3,2,1) and is parallel to the vector $2\hat{i}+2\hat{j}-3\hat{k}$ is

A. $\left(2\hat{i}+2\hat{j}-3\hat{k}\right)+\lambda\left(3\hat{i}+2\hat{j}+\hat{k}\right)$

B. $\left(3\hat{i}+2\hat{j}+\hat{k}\right)+\lambda\left(2\hat{i}+2\hat{j}-3\hat{k}\right)$

C. $\left(2\hat{i}+2\hat{j}-3\hat{k}\right)+\lambda\left(-\hat{i}-4\hat{k}\right)$

D. $\left(3\hat{i}+2\hat{j}+\hat{k}\right)+\lambda\left(-\hat{i}-4\hat{k}\right)$

Answer: B

Watch Video Solution

7. Find the vector equation of a line parallel to the vector $2\hat{i}-\hat{j}+2\hat{k}$ and passing through a point A with position vector $3\hat{i}+\hat{j}-\hat{k}$.

A. $\left(3\hat{i}+\hat{j}-\hat{k}\right)+\lambda\left(2\hat{i}-\hat{i}+2\hat{k}\right)$

B. $\left(2\hat{i}-\hat{j}+2\hat{k}\right)+\lambda\left(3\hat{i}+\hat{j}-\hat{k}\right)$

C. $\left(\hat{i}+2\hat{j}-3\hat{k}\right)+\lambda\left(2\hat{i}-\hat{j}+2\hat{k}\right)$

D. $\left(2\hat{i}-\hat{j}+2\hat{k}\right)+\lambda\left(\hat{i}+2\hat{j}-3\hat{k}\right)$

Answer: A

Watch Video Solution

8. The cartesian form of equation of a line passing through the point with position vector $4\hat{i}-\hat{j}+2\hat{k}$ and is in the direction of $-2\hat{i}+\hat{j}+\hat{k}$,is

A. $\left(4\hat{i}-\hat{j}-2\hat{k}\right)+\lambda\left(-2\hat{i}+\hat{j}+\hat{k}\right)$

B. $\left(-2\hat{i}+\hat{j}+\hat{k}\right)+\lambda\left(4\hat{i}+\hat{j}-2\hat{k}\right)$

C. $\left(4\hat{i}-\hat{j}+2\hat{k}\right)+\lambda\left(-2\hat{i}+\hat{j}+\hat{k}\right)$

D. $\left(-2\hat{i}+\hat{j}+\hat{k}\right)+\lambda\left(4\hat{i}+\hat{j}+2\hat{k}\right)$

Answer: C

Watch Video Solution

9. The vector equation of a line passing through the point with position vector $2\hat{i} - \hat{j} - 4\hat{k}$ and is in the direction of $\hat{i} - 2\hat{j} + \hat{k}$ is

A. $\left(2\hat{i} - \hat{j} - 4\hat{k}\right) + \lambda\left(\hat{i} - 2\hat{j} + \hat{k}\right)$

B. $\left(\hat{i} + \hat{j} - 5\hat{k}\right) + \lambda\left(\hat{i} - 2\hat{j} + \hat{k}\right)$

C. $\left(-\hat{i} - \hat{j} + 5\hat{k}\right) + \lambda\left(\hat{i} - 2\hat{j} + \hat{k}\right)$

D. $\left(-2\hat{i} + \hat{j} + \hat{k}\right) + \lambda\left(4\hat{i} + \hat{j} + 2\hat{k}\right)$

Answer: A

Watch Video Solution

10. The cartesian equation of a line passing through the point having position vector $2\hat{i} + \hat{j} - \hat{k}$ and parallel to the line passing joining the points $-\hat{i} + \hat{j} + 4\hat{k}$ and $\hat{i} + 2\hat{j} + 2\hat{k}$, is

A. $\left(2\hat{i} + \hat{j} - 2\hat{k}\right) + \lambda\left(2\hat{i} + \hat{j} - \hat{k}\right)$

B. $\left(2\hat{i} + \hat{j} - 2\hat{k}\right) + \lambda\left(-2\hat{i} + \hat{j} + \hat{k}\right)$

C. $\left(2\hat{i}+\hat{j}-\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}-2\hat{k}\right)$

D. $\left(2\hat{i}+\hat{j}-\hat{k}\right)+\lambda\left(-2\hat{i}+\hat{j}+2\hat{k}\right)$

Answer: C

Watch Video Solution

11. The vector equation of the line passing through a point with position vector $2\hat{i}-\hat{j}+\hat{k}$ and parallel to the line joining the points with position vectors $-\hat{i}+4\hat{j}+\hat{k}$ and $\hat{i}+2\hat{j}+2\hat{k}$ is $r=\left(2\hat{i}-\hat{j}+\hat{k}\right)+\lambda\left(x\hat{i}-2\hat{j}+\hat{k}\right)$ where x is equal to

A. $\left(2\hat{i}+2\hat{j}-\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}+\hat{k}\right)$

B. $\left(2\hat{i}+\hat{j}-\hat{k}\right)+\lambda\left(2\hat{i}+2\hat{j}-2\hat{k}\right)$

C. $\left(2\hat{i}-2\hat{j}+\hat{k}\right)+\lambda\left(2\hat{i}-\hat{j}+\hat{k}\right)$

D. $\left(2\hat{i}-\hat{j}+\hat{k}\right)+\lambda\left(2\hat{i}-2\hat{j}+\hat{k}\right)$

Answer: D

Watch Video Solution

12. The vector equation of a line passing through the point (5,4,3) and having directions ratios $-3, 4, 2$ is

A. $-\left(5\hat{i}-4\hat{j}-3\hat{k}\right)+\lambda\left(-3\hat{i}+4\hat{j}+2\hat{k}\right)$

B. $\left(5\hat{i}+4\hat{j}+3\hat{k}\right)+\lambda\left(-3\hat{i}+4\hat{j}+2\hat{k}\right)$

C. $\left(-3\hat{i}+4\hat{j}+2\hat{k}\right)+\lambda\left(-5\hat{i}-4\hat{j}-3\hat{k}\right)$

D. $\left(-3\hat{i}+4\hat{j}+2\hat{k}\right)+\lambda\left(-5\hat{i}-4\hat{j}-3\hat{k}\right)$

Answer: B

Watch Video Solution

13. The equation of a line passing through the point (4,-2,5) and parallel to the vector $3\hat{i}-\hat{j}+2\hat{k}$ is

A. $\frac{x-4}{3}=\frac{y+2}{-1}=\frac{z-5}{2}$

B. $\frac{x+4}{3} = \frac{y-2}{-1} = \frac{z+5}{2}$

C. $\frac{x-3}{4} = \frac{y+1}{-2} = \frac{z-2}{5}$

D. $\frac{x+3}{4} = \frac{y-1}{-2} = \frac{z+2}{5}$

Answer: A

Watch Video Solution

14. The cartesian equation of a line passing through the point (3,2,1) and is parallel to the vector $2\hat{i} + 2\hat{j} - 3\hat{k}$ is

A. $\frac{x+3}{2} = \frac{y+2}{2} = \frac{z+1}{-3}$

B. $\frac{x-3}{2} = \frac{y-2}{2} = \frac{z-1}{-3}$

C. $\frac{x+2}{-3} = \frac{y+2}{2} = \frac{z-3}{1}$

D. $\frac{x-2}{3} = \frac{y-2}{2} = \frac{z+3}{1}$

Answer: B

Watch Video Solution

15. The cartesian form of equation of a line passing through the point with position vector $4\hat{i} - \hat{j} + 2\hat{k}$ and is in the direction of $-2\hat{i} + \hat{j} + \hat{k}$,is

A. $\frac{x-4}{-2} = \frac{y+1}{1} = \frac{z-2}{1}$

B. $\frac{x+4}{-2} = \frac{y-1}{1} = \frac{z+2}{1}$

C. $\frac{x+2}{4} = \frac{y-1}{-1} = \frac{z-1}{2}$

D. $\frac{x-2}{-4} = \frac{y+1}{1} = \frac{z+1}{-2}$

Answer: A

Watch Video Solution

16. Find the equation of the line in Cartesiasn form that passes through the point with positoin vector $2\hat{i} - \hat{j} + 4\hat{k}$ and is in the direction $\hat{i} + 2\hat{j} - \hat{k}$.

A. $\frac{x-2}{-1}=\frac{y+1}{2}=\frac{z+4}{1}$

B. $\frac{x-2}{1}=\frac{y+1}{2}=\frac{z+4}{-1}$

C. $\frac{x-2}{1}=\frac{y+1}{-2}=\frac{z+4}{1}$

D. $\frac{x+2}{1}=\frac{y-1}{-2}=\frac{z-4}{1}$

Answer: C

Watch Video Solution

17. The cartesian equation of a line passing through the point having position vector $2\hat{i}+\hat{j}-\hat{k}$ and parallel to the line passing joining the points $-\hat{i}+\hat{j}+4\hat{k}$ and $\hat{i}+2\hat{j}+2\hat{k}$, is

A. $\frac{x-2}{2}=\frac{y-1}{1}=\frac{z+1}{-2}$

B. $\frac{x+2}{2}=\frac{y+1}{1}=\frac{z-1}{-2}$

C. $\frac{x-2}{-2}=\frac{y-1}{1}=\frac{z+1}{2}$

D. $\frac{x+2}{-2}=\frac{y+1}{1}=\frac{z-2}{2}$

Answer: A

Watch Video Solution

18. The symmetric form of the line given by

$\vec{r} = \left(2\hat{i} - \hat{j} + 3\hat{k}\right) + \lambda\left(3\hat{i} - 4\hat{j} + 5\hat{k}\right)$ is

A. $\frac{x-2}{3} = \frac{y+1}{-4} = \frac{z-3}{5}$

B. $\frac{x+2}{3} = \frac{y-1}{-4} = \frac{z-1}{-2}$

C. $\frac{x-2}{-2} = \frac{y-1}{1} = \frac{z+1}{2}$

D. $\frac{x+2}{-2} = \frac{y+1}{1} = \frac{z-2}{2}$

Answer: A

Watch Video Solution

19. The cartesian equation of line passing through the points (5,4,3) and having direction ratios $-3, 4, 2$ is

A. $\frac{x+5}{-3} = \frac{y+4}{-4} = \frac{z+3}{2}$

B. $\frac{x+5}{-3} = \frac{y+4}{4} = \frac{z+3}{2}$

C. $\frac{x-5}{-3} = \frac{y-4}{-4} = \frac{z-3}{2}$

D. $\frac{x-5}{-3} = \frac{y-4}{4} = \frac{z-3}{2}$

Answer: D

Watch Video Solution

20. Find the equation of line equally inclined to co-ordinate axes and passes through (-5, 1.-2).

A. $x-5 = y+1 = z-2$

B. $\sqrt{3}(x+5) = y-1 = \sqrt{3}(z+2)$

C. $x+5 = 1-y = z+2$

D. $x+5 = y-1 = z+2$

Answer: D

Watch Video Solution

21. The vector equations of a line passing through the origin and the point (5,-2,3) is

A. $\lambda\left(-5\hat{i}+2\hat{j}-3\hat{k}\right)$

B. $\lambda\left(5\hat{i}-2\hat{j}+3\hat{k}\right)$

C. $-5\hat{i}+2\hat{j}-3\hat{k}$

D. $5\hat{i}-2\hat{j}+3\hat{k}$

Answer: B

Watch Video Solution

22. Find the vector wuation of the line passing through the points A(3,4, -7) and B (6,-1, 1)

A. $\left(6\hat{i}-\hat{j}+\hat{k}\right)+\lambda\left(3\hat{i}-5\hat{j}+8\hat{k}\right)$

B. $\left(3\hat{i}+4\hat{j}-7\hat{k}\right)+\lambda\left(3\hat{i}-5\hat{j}+8\hat{k}\right)$

C. $\left(6\hat{i}-\hat{j}+\hat{k}\right)+\lambda\left(-3\hat{i}+5\hat{j}-8\hat{k}\right)$

D. $\left(3\hat{i}+4\hat{j}-7\hat{k}\right)+\lambda\left(-3\hat{i}+5\hat{j}-8\hat{k}\right)$

Answer: B

Watch Video Solution

23. the line passing through the points $(3, -2-, -5)$, and $(3, -2, 6)$

A. $\left(3\hat{i}-2\hat{j}-5\hat{k}\right)+\lambda\left(-11\hat{k}\right)$

B. $\left(3\hat{i}-2\hat{j}-5\hat{k}\right)+\lambda\left(11\hat{k}\right)$

C. $\left(3\hat{i}-2\hat{j}-5\hat{k}\right)+\lambda\left(-4\hat{j}\right)$

D. $\left(3\hat{i}-2\hat{j}-5\hat{k}\right)+\lambda\left(6\hat{i}\right)$

Answer: B

Watch Video Solution

24. The vector equation of a line passing through the points $(-2, 3, 4)$ and (1,1,2) is

A. $\left(-2\hat{i}+3\hat{j}+4\hat{k}\right)+\lambda\left(3\hat{i}-2\hat{j}-2\hat{k}\right)$

B. $-\left(2\hat{i}+3\hat{j}+4\hat{k}\right)+\lambda\left(3\hat{i}-2\hat{j}+2\hat{k}\right)$

C. $\left(-2\hat{i}+3\hat{j}+4\hat{k}\right)+\lambda\left(3\hat{i}-2\hat{j}+2\hat{k}\right)$

D. $\left(-2\hat{i}+3\hat{j}+4\hat{k}\right)+\lambda\left(3\hat{i}+2\hat{j}+2\hat{k}\right)$

Answer: A

Watch Video Solution

25. The vector equation of a line passing through the points A(4,2,1) and B(2,-1,3) is

A. $\left(-4\hat{i}-2\hat{j}-\hat{k}\right)+\lambda\left(2\hat{i}+3\hat{j}-2\hat{k}\right)$

B. $\left(4\hat{i}+2\hat{j}+\hat{k}\right)+\lambda\left(-2\hat{i}-3\hat{j}+2\hat{k}\right)$

C. $\left(-4\hat{i}-2\hat{j}-\hat{k}\right)+\lambda\left(2\hat{i}+3\hat{j}-4\hat{k}\right)$

D. $\left(4\hat{i}+2\hat{j}+\hat{k}\right)+\lambda\left(-2\hat{i}-3\hat{j}+4\hat{k}\right)$

Answer: B

Watch Video Solution

26. A line passing through the points A (-2 , -1 , 5) and B (1, 3 , -1) ,find the equation of the line in parametric form. Also, write the equation in non - parametric form.

A. $\vec{r}\times\left(3\hat{i}+4\hat{j}-6\hat{k}\right)=14\hat{i}+3\hat{j}+5\hat{k}$

B. $\vec{r}\times\left(3\hat{i}+4\hat{j}-6\hat{k}\right)=14\hat{i}-3\hat{j}-5\hat{k}$

C. $\vec{r}\times\left(3\hat{i}+4\hat{j}-6\hat{k}\right)=14\hat{i}-3\hat{j}+5\hat{k}$

D. $\vec{r}\times\left(3\hat{i}+4\hat{j}-6\hat{k}\right)=-14\hat{i}+3\hat{j}-5\hat{k}$

Answer: D

Watch Video Solution

27. The cartesian equation of a line passing through the origin and point (5,-2,3) is

A. $\frac{x-5}{5}=\frac{y+2}{-2}=\frac{z-3}{3}$

B. $\frac{x-5}{-5}=\frac{y-2}{-2}=\frac{z-3}{3}$

C. $\frac{x}{5}=\frac{y}{-2}=\frac{z}{3}$

D. $\frac{x}{-5}=\frac{y}{2}=\frac{z}{3}$

Answer: C

Watch Video Solution

28. Find the vector wuation of the line passing through the points A(3,4, -7) and B (6,-1, 1)

A. $\frac{x+3}{-3}=\frac{y+4}{5}=\frac{z-7}{8}$

B. $\frac{x-3}{-3}=\frac{y-4}{5}=\frac{z+7}{8}$

C. $\frac{x+3}{3}=\frac{y+4}{-5}=\frac{z-7}{8}$

D. $\frac{x-3}{3}=\frac{y-4}{-5}=\frac{z+7}{8}$

Answer: D

Watch Video Solution

29. the line passing through the points $(3, -2- -5)$, and $(3, -2, 6)$

A. $\frac{x+3}{0}=\frac{y-2}{0}=\frac{z-15}{-11}$

B. $\frac{x+3}{0}=\frac{y-2}{0}=\frac{z-5}{11}$

C. $\frac{x-3}{0}=\frac{y+2}{0}=\frac{z+5}{-11}$

D. $\frac{x-3}{0}=\frac{y+2}{0}=\frac{z+5}{11}$

Answer: D

Watch Video Solution

30. The equation of a line passing through the points $A(4, 2, 1)$ and B(2,-1,3) is

A. $\frac{x-4}{-2} = \frac{y-2}{3} = \frac{z-1}{2}$

B. $\frac{x+4}{-2} = \frac{y-2}{0} = \frac{z-5}{11}$

C. $\frac{x-4}{2} = \frac{y-2}{3} = \frac{z-1}{-2}$

D. $\frac{x+4}{2} = \frac{y+2}{3} = \frac{z+1}{-2}$

Answer: C

Watch Video Solution

31. The equation of a line passing through the points $A(2, -1, 1)$ and $B(3, 1, 1)$ is

A. $\frac{x-2}{1} = \frac{y+1}{2}, z = 1$

B. $\frac{x-2}{1} = \frac{y-1}{2}, z = 1$

C. $\frac{x-2}{1} = \frac{y+1}{2}, z = -1$

D. $\frac{x+4}{2} = \frac{y+2}{3} = \frac{z+1}{-2}$

Answer: A

Watch Video Solution

32. If the line passing through the points (5,1,p) and (3,q,1) crosses the YZ plane at the point $\left(0, \frac{17}{2}, -\frac{13}{2}\right)$, then

A. p=6, q=4

B. $p = -6, q = 4$

C. $p = 6, q = -4$

D. $p = -6, q = -4$

Answer: A

Watch Video Solution

33. If x co-ordinate of a point on the line passing through the points (2,2,1) and (5,1,-2) is 2, then the y co-ordinate of the point is

A. -3

B. 3

C. 2

D. -2

Answer: C

Watch Video Solution

34. The equation of a line passing through the points (a,b,c) and(a-b,b-c, c-a) is

A. $\frac{x-a}{a}=\frac{y-b}{b}=\frac{z-c}{c}$

B. $\frac{x-a}{b}=\frac{y-b}{c}=\frac{z-c}{a}$

C. $\frac{x-a}{a-b}=\frac{y-b}{b-c}=\frac{z-c}{c-a}$

D. $\frac{x-a}{2a-b}=\frac{y-b}{2b-c}=\frac{z-c}{2c-a}$

Answer: B

Watch Video Solution

35. Find the cartesian equation of the line which passes through the point $(-2, 4, -5)$ and parallel and line are $(3, 5, 6)$. So, the equation of line is,

$$\frac{x-(-2)}{3}=\frac{y-4}{5}=\frac{z-(-5)}{6}.$$

A. $\frac{x-2}{3}=(y+4)=\frac{z-5}{6}$

B. $\frac{x+2}{3}=\frac{y-4}{5}=\frac{z+5}{6}$

C. $\frac{x-2}{3}=\frac{y+3}{5}=\frac{z+5}{6}$

D. $\frac{x+2}{3}=\frac{y+4}{5}=\frac{z+5}{6}$

Answer: B

Watch Video Solution

36. The equation of a line passing through the point $(3, -2, 1)$ with the direction angle is $135^\circ, 60^\circ, 120^\circ$ is

A. $\frac{x-3}{\sqrt{2}} = \frac{y+2}{-1} = \frac{z-1}{1}$

B. $\frac{x-3}{-1} = \frac{y+2}{\sqrt{2}} = \frac{z-1}{\sqrt{2}}$

C. $\frac{x+3}{-\sqrt{2}} = \frac{y+2}{1} = \frac{z-1}{1}$

D. $\frac{x+3}{1} = \frac{y+2}{1} = \frac{z-1}{\sqrt{2}}$

Answer: A

Watch Video Solution

37. The vector equation of a line passing through the point $\hat{i} + 2\hat{j} + 3\hat{k}$ and perpendicular to the vectors $\hat{i} + \hat{j} + \hat{k}$ and $2\hat{i} - \hat{j} + \hat{k}$ is

A. $\left(\hat{i} + 2\hat{j} + 3\hat{k}\right) + \lambda\left(-2\hat{i} - \hat{j} + 3\hat{k}\right)$

B. $\left(\hat{i} + 2\hat{j} + 3\hat{k}\right) + \lambda\left(2\hat{i} + \hat{j} - \hat{k}\right)$

C. $\left(\hat{i} + 2\hat{j} + 3\hat{k}\right) + \lambda\left(2\hat{i} + \hat{j} - \hat{k}\right)$

D. $\left(\hat{i}+2\hat{j}+3\hat{k}\right)+\lambda\left(2\hat{i}-\hat{j}-2\hat{k}\right)$

Answer: B

Watch Video Solution

38. Find the vector equation of the line passing through the point $2\hat{i}+\hat{j}-3\hat{k}$ and perpendicular to the vectors $\hat{i}+\hat{j}+\hat{k}$ and $\hat{i}+2\hat{j}-\hat{k}$

.

A. $\left(2\hat{i}+\hat{j}-3\hat{k}\right)+\lambda\left(-3\hat{i}+2\hat{j}-\hat{k}\right)$

B. $\left(2\hat{i}+\hat{j}-3\hat{k}\right)+\lambda\left(3\hat{i}+2\hat{j}-\hat{k}\right)$

C. $\left(2\hat{i}+\hat{j}-3\hat{k}\right)+\lambda\left(-3\hat{i}-2\hat{j}+\hat{k}\right)$

D. $\left(2\hat{i}+\hat{j}-3\hat{k}\right)+\lambda\left(-3\hat{i}+2\hat{j}+\hat{k}\right)$

Answer: D

Watch Video Solution

39. Equation of the line passing through the point (2,3, -4) and perpendicular to XZ-plane is

A. $\frac{x-2}{0}=\frac{y-3}{1}=\frac{z+1}{0}$

B. $\frac{x-2}{1}=\frac{y-3}{0}=\frac{z+1}{0}$

C. $\frac{x-2}{0}=\frac{y-3}{0}=\frac{z+1}{1}$

D. $\frac{x-2}{1}=\frac{y-3}{1}=\frac{z+1}{1}$

Answer: B

Watch Video Solution

40. The equation of a line passing through point $(2, 3, -1)$ and perpendicular to ZX plane is

A. $\frac{x-2}{0}=\frac{y-3}{1}=\frac{z+1}{0}$

B. $\frac{x-2}{1}=\frac{y-3}{0}=\frac{z+1}{0}$

C. $\frac{x-2}{0}=\frac{y-3}{0}=\frac{z+1}{1}$

D. $\frac{x-2}{1}=\frac{y-3}{1}=\frac{z+1}{1}$

Answer: A

Watch Video Solution

41. The equation of a line passing through point (2,3,-1) and perpendicular to XY plane is

A. $\frac{x-2}{0}=\frac{y-3}{1}=\frac{z+1}{0}$

B. $\frac{x-2}{1}=\frac{y-3}{0}=\frac{z+1}{0}$

C. $\frac{x-2}{0}=\frac{y-3}{0}=\frac{z+1}{1}$

D. $\frac{x-2}{1}=\frac{y-3}{1}=\frac{z+1}{1}$

Answer: C

Watch Video Solution

42. The equation of a line passing through (a, b, c)

and parallel tp z-axis is

A. $\frac{x-a}{l}-\frac{y-b}{m}=\frac{z-c}{0}$

B. $\frac{x-a}{0}=\frac{y-b}{0}=\frac{z-c}{n}$

C. $\frac{x-a}{l}=\frac{y-b}{m}=\frac{z-c}{1}$

D. $\frac{x-a}{0}=\frac{y-b}{m}=\frac{z-c}{0}$

Answer: A

Watch Video Solution

43. The equation of a line passing through the point (-1,4,6) and perpendicular to the lines with direction ratios $2, -6, -3$ and 4,3,-1 is

A. $\frac{x+1}{3}=\frac{y-4}{-2}=\frac{z-6}{6}$

B. $\frac{x+1}{3}=\frac{y-4}{2}=\frac{z-6}{6}$

C. $\frac{x-1}{3}=\frac{y+4}{-2}=\frac{z+6}{6}$

D. $\frac{x-1}{3}=\frac{y+4}{2}=\frac{z+6}{6}$

Answer: A

Watch Video Solution

44. The equation of a line passing through the point (3,-1,4) and perpendicular to the lines with direction ratios 3,2,-4 and 2,-3,2 is

A. $\frac{x+3}{8}=\frac{y-1}{-14}=\frac{z+4}{13}$

B. $\frac{x-3}{8}=\frac{y+1}{-14}=\frac{z-4}{13}$

C. $\frac{x+3}{8}=\frac{y-1}{14}=\frac{z+4}{13}$

D. $\frac{x-3}{8}=\frac{y+1}{14}=\frac{z-4}{13}$

Answer: D

Watch Video Solution

45. Find the equation of the line passing through the point (3,1,2) and perpendicular to the lines $\frac{x-1}{1}=\frac{y-2}{2}=\frac{z-3}{3}$ and $\frac{x}{-3}=\frac{y}{2}=\frac{z}{5}$

A. $\frac{x-2}{2}=\frac{y-1}{-7}=\frac{z-3}{4}$

B. $\frac{x+2}{2}=\frac{y+1}{-7}=\frac{z+3}{4}$

C. $\frac{x-2}{2}=\frac{y-1}{-7}=\frac{z-3}{2}$

D. $\frac{x+2}{2}=\frac{y+1}{-7}=\frac{z+3}{2}$

Answer: A

Watch Video Solution

46. Find the equation of the line passing through the point (3,1,2) and perpendicular to the lines $\frac{x-1}{1}=\frac{y-2}{2}=\frac{z-3}{3}$ and $\frac{x}{-3}=\frac{y}{2}=\frac{z}{5}$

A. $\frac{x-3}{2}=\frac{y-1}{-7}=\frac{z-2}{2}$

B. $\frac{x+3}{2} = \frac{y+1}{7} = \frac{z-2}{2}$

C. $\frac{x-3}{2} = \frac{y-1}{-7} = \frac{z-2}{4}$

D. $\frac{x+3}{2} = \frac{y+1}{-7} = \frac{z+2}{4}$

Answer: C

Watch Video Solution

47. Find the equation of the perpendicular from point $(3, -1, 11)$ to line $\frac{x}{2} = \frac{y-2}{3} = \frac{z-3}{4}$. Also, find the coordinates of foot of perpendicular and the length of perpendicular.

A. $\frac{x+1}{1} = \frac{y-3}{-6} = \frac{z+11}{3}$

B. $\frac{x-3}{2} = \frac{y-1}{-6} = \frac{z+11}{3}$

C. $\frac{x-3}{1} = \frac{y+1}{-6} = \frac{z-11}{4}$

D. $\frac{x-3}{2} = \frac{y+1}{6} = \frac{z-11}{7}$

Answer: C

Watch Video Solution

48. The equation of line passing through (3,-1,2) and perpendicular to the lines

$\vec{r} = \left(\hat{i} + \hat{j} - \hat{k}\right) + \lambda\left(2\hat{i} - 2\hat{j} + \hat{k}\right)$

and $\vec{r} = \left(2\hat{i} + \hat{j} - 3\hat{k}\right) + \mu\left(\hat{i} - 2\hat{j} + 2\hat{k}\right)$ is

A. $\left(3\hat{i} - \hat{j} + 2\hat{k}\right) + t\left(2\hat{i} + 3\hat{j} + 2\hat{k}\right)$

B. $\left(3\hat{i} - \hat{j} + 2\hat{k}\right) + t\left(2\hat{i} + 3\hat{j} - 2\hat{k}\right)$

C. $\left(3\hat{i} - \hat{j} + 2\hat{k}\right) + t\left(2\hat{i} - 3\hat{j} + 2\hat{k}\right)$

D. $\left(3\hat{i} - \hat{j} + 2\hat{k}\right) + t\left(-2\hat{i} + 3\hat{j} + 2\hat{k}\right)$

Answer: A

Watch Video Solution

49. The vector equation of the line passing through the point (-1, -1 ,2) and parallel to the line 2x - 2= 3y +1 = 6z -2 is

A. $\left(-\hat{i}-\hat{j}+2\hat{k}\right)+\lambda\left(3\hat{i}+2\hat{j}+\hat{k}\right)$

B. $\left(-\hat{i}-\hat{j}+2\hat{k}\right)+\lambda\left(\hat{i}+2\hat{j}+3\hat{k}\right)$

C. $\left(-\hat{i}-\hat{j}+2\hat{k}\right)+\lambda\left(\hat{i}+2\hat{j}+3\hat{k}\right)$

D. $\left(-\hat{i}-\hat{j}+2\hat{k}\right)+\lambda\left(\hat{i}+2\hat{j}+3\hat{k}\right)$

Answer: A

Watch Video Solution

50. The cartesian equation of a line is $\frac{x-6}{2}=\frac{y+4}{7}=\frac{z-5}{3}$, find its vector equation .

A. $\left(-6\hat{i}+4\hat{j}-5\hat{k}\right)+\lambda\left(2\hat{i}+7\hat{j}+3\hat{k}\right)$

B. $\left(6\hat{i}-4\hat{j}+5\hat{k}\right)+\lambda\left(2\hat{i}+7\hat{j}+3\hat{k}\right)$

C. $\left(2\hat{i}+7\hat{j}+3\hat{k}\right)+\lambda\left(-6\hat{i}+4\hat{j}-5\hat{k}\right)$

D. $\left(2\hat{i}+7\hat{j}+3\hat{k}\right)+\lambda\left(6\hat{i}-4\hat{j}+5\hat{k}\right)$

Answer: B

Watch Video Solution

51. The vector equation of a line $\frac{x+5}{3} = \frac{y+4}{5} = \frac{z+5}{6}$ is

A. $\left(3\hat{i} + 5\hat{j} + 6\hat{k}\right) + \lambda\left(5\hat{i} + 4\hat{j} + 5\hat{k}\right)$

B. $\left(5\hat{i} + 4\hat{j} + 5\hat{k}\right) + \lambda\left(3\hat{i} + 5\hat{j} + 6\hat{k}\right)$

C. $\left(-5\hat{i} - 4\hat{j} - 5\hat{k}\right) + \lambda\left(3\hat{i} + 5\hat{j} + 6\hat{k}\right)$

D. $\left(3\hat{i} + 5\hat{j} + 6\hat{k}\right) + \lambda\left(-5\hat{i} - 4\hat{j} - 5\hat{k}\right)$

Answer: C

Watch Video Solution

52. The cartesian equation of a line is $3x + 1 = 6y - 2 = 1 - z$.

Find the vector equation of the line.

A. $\left(\hat{i} + \hat{j} - \hat{k}\right) + \lambda\left(2\hat{i} + \hat{j} - \hat{k}\right)$

B. $\left(-\hat{i} + \hat{j} + \hat{k}\right) + \lambda\left(2\hat{i} + \hat{j} - \hat{k}\right)$

C. $\left(\frac{1}{3}\hat{i}+\frac{1}{6}\hat{j}-\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}-6\hat{k}\right)$

D. $\left(-\frac{1}{3}\hat{i}+\frac{1}{3}\hat{j}+\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}-6\hat{k}\right)$

Answer: D

Watch Video Solution

53. The cartesian equation of a line is 3x - 1 = 6y + 2 = 1 - z . Find the vector equation of the line .

A. $\left(-\frac{1}{3}\hat{i}+\frac{1}{3}\hat{i}+\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}-6\hat{k}\right)$

B. $\left(\frac{1}{3}\hat{i}-\frac{1}{3}\hat{j}+\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}-6\hat{k}\right)$

C. $\left(\hat{i}+2\hat{j}+\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}-6\hat{k}\right)$

D. $\left(\hat{i}-2\hat{j}-\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}-6\hat{k}\right)$

Answer: B

Watch Video Solution

54. The vector equation of the line passing through the point (-1, -1 ,2) and parallel to the line 2x - 2= 3y +1 = 6z -2 is

A. $\left(\hat{i}-\hat{j}+\hat{k}\right)+\lambda\left(3\hat{i}+2\hat{j}+\hat{k}\right)$

B. $\left(\hat{i}-\frac{1}{3}\hat{j}+\frac{1}{3}\hat{k}\right)+\lambda\left(3\hat{i}+2\hat{j}+\hat{k}\right)$

C. $\left(\hat{i}-\frac{1}{3}\hat{j}+\frac{1}{6}\hat{k}\right)+\lambda\left(3\hat{i}+2\hat{j}+\hat{k}\right)$

D. $\left(\hat{i}-2\hat{j}-\hat{k}\right)+\lambda\left(2\hat{i}+\hat{j}-6\hat{k}\right)$

Answer: C

Watch Video Solution

55. The vector form of the equation of the line 6x - 2 = 3y + 1 = 2z - 2 is

A. $\left(\frac{1}{3}\hat{i}+\frac{1}{3}\hat{j}-\hat{k}\right)+\lambda\left(\hat{i}+2\hat{j}+3\hat{k}\right)$

B. $\left(\frac{1}{3}\hat{i}-\frac{1}{3}\hat{j}+\hat{k}\right)+\lambda\left(\hat{i}+2\hat{j}+3\hat{k}\right)$

C. $\left(\hat{i}+\hat{j}-3\hat{k}\right)+\lambda\left(\hat{i}+2\hat{j}+3\hat{k}\right)$

D. $\left(\hat{i}-\hat{j}+3\hat{k}\right)+\lambda\left(\hat{i}+2\hat{j}+3\hat{k}\right)$

Answer: B

Watch Video Solution

56. The vector equation of the line $\frac{x+2}{3} = \frac{1-y}{-2} = \frac{z-5}{7}$ is

A. $\left(-2\hat{i} + \frac{5}{2}\hat{j} - \hat{k}\right) + \lambda\left(\frac{4}{5}\hat{i} + \frac{3}{5}\hat{j}\right)$

B. $\left(-2\hat{i} + \frac{5}{2}\hat{j} - \hat{k}\right) + \lambda\left(\frac{2}{5}\hat{i} + \frac{3}{5}\hat{j}\right)$

C. $\left(-2\hat{i} + \frac{5}{2}\hat{j} - \hat{k}\right) + \lambda\left(2\hat{i} - \frac{3}{5}\hat{j}\right)$

D. $\left(-2\hat{i} + \frac{5}{2}\hat{j} - \hat{k}\right) + \lambda\left(4\hat{i} - \frac{3}{5}\hat{j}\right)$

Answer: A

Watch Video Solution

57. The Cartesian equationof a line are $3x + 1 = 6y = 2 = 1 - z$. Find the direction ratios and write down its equation in vector form.

A. $-2, 1, -3$

B. $6, 2, -1$

C. $2, 1, -6$

D. $3, 6, -1$

Answer: C

Watch Video Solution

58. The Cartesian equationof a line are $3x + 1 = 6y = 2 = 1 - z$. Find the direction ratios and write down its equation in vector form.

A. 2,1,-6

B. $-2, 1, -3$

C. $6, 2, -1$

D. $3, 6, -1$

Answer: A

Watch Video Solution

59. The equation of line is $2x - 2 = 3y + 1 = 6z - 2$

find its direction ratios and also find the vector

equation of the line .

A. 1,2,3

B. 3,2,1

C. 6,3,2

D. 2,3,6

Answer: B

Watch Video Solution

60. Direction cosines of the line $\frac{x+2}{2} = \frac{2y-5}{3}, z = -1$ are

A. $\frac{4}{5}, \frac{3}{5}, 0$

B. $\frac{3}{5}, \frac{4}{5}, \frac{1}{5}$

C. $-\frac{3}{5}, \frac{4}{5}, 0$

D. $\frac{4}{5}, -\frac{2}{5}, \frac{1}{5}$

Answer: A

Watch Video Solution

61. If $\frac{x-1}{l} = \frac{y-2}{m} = \frac{z+1}{n}$ is the equation of the line through $(1, 2, -1)$ and $(-1, 0, 1)$, then (l, m, n)

A. (0,1,0)

B. (-1,0,1)

C. (1,1,-1)

D. (1,2,-1)

Answer: C

Watch Video Solution

62. The straight line $\frac{x-3}{3}=\frac{y-2}{1}=\frac{z-1}{0}$ is Parallel to x-axis Parallel to the y-axis Parallel to the z-axis Perpendicular to the z-axis

A. parallel to X-axis

B. parallel to Y-axis

C. parallel to Z-axis

D. perpendicular to Z-axis

Answer: D

Watch Video Solution

63. The points (-2,3,4), (1,1,2) and (4,-1,0) are

A. collinear

B. non-collinear

C. non-coplanar

D. non-collinear but coplanar

Answer: A

Watch Video Solution

64. The points with position vectors $5\hat{i}+5\hat{k}, -4\hat{i}+3\hat{j}-\hat{k}$ and $2\hat{i}+\hat{j}+3\hat{k}$

A. collinear

B. non-collinear

C. non-collinear and non planar

D. non-collinear but coplanar

Answer: A

Watch Video Solution

65. Find λ, if the points $(-1, 3, 2), (-4, 2, -2)$ and $(5, 5, \lambda)$ are collinear.

A. -6

B. 5

C. 6

D. 10

Answer: D

Watch Video Solution

66. If $l_1, m_1, n_1, l_2, m_2, n_2$ and l_3, m_3, n_3 are direction cosines of three mutuallyy perpendicular lines then, the value of $\begin{vmatrix} l_1 & m_1 & n_1 \\ l_2 & m_2 & n_2 \\ l_3 & m_3 & n_3 \end{vmatrix}$ is

A. $\begin{vmatrix} l_1 & m_2 & n_3 \\ l_2 & m_3 & n_1 \\ l_3 & m_1 & n_2 \end{vmatrix} = 0$

B. $\begin{vmatrix} l_1 & m_1 & n_1 \\ l_2 & m_2 & n_2 \\ l_3 & m_3 & n_3 \end{vmatrix} = 0$

C. $l_1 l_2 l_3 + m_1 m_2 m_3 + n_1 n_2 n_3 = 0$

D. $l_1 l_2 l_3 = m_1 m_2 m_3 = n_1 n_2 n_3$

Answer: B

Watch Video Solution

67. The line joining the points $6\vec{a} - 4\vec{b} + 4\vec{c}, -4\vec{c}$ and the line joining the points $-\vec{a} - 2\vec{b} - 3\vec{c}, \vec{a} + 2\vec{b} - 5\vec{c}$ intersect at

A. $-4\hat{a}$

B. $-4\hat{b}$

C. $-4\hat{c}$

D. $-4\hat{i} - 4\hat{b} - 4\hat{c}$

Answer: C

Watch Video Solution

68. The line joining the points $6\vec{a} - 4\vec{b} + 4\vec{c}, -4\vec{c}$ and the line joining the points $-\vec{a} - 2\vec{b} - 3\vec{c}, \vec{a} + 2\vec{b} - 5\vec{c}$ intersect at

A. B

B. C

C. D

D. A

Answer: A

Watch Video Solution

69. Let $\vec{a} = -\hat{i} - \hat{k}, \vec{b} = -\hat{i} + \hat{j}$ and $\vec{c} = i + 2\hat{j} + 3\hat{k}$ be three given vectors. If $\vec{r}$ is a vector such that $\vec{r} \times \vec{b} = \vec{c} \times \vec{b}$ and $\vec{r} . \vec{a} = 0$ then find the value of $\vec{r} . \vec{b}$.

A. $3\hat{i} - \hat{j} - \hat{k}$

B. $3\hat{i}+\hat{j}-\hat{k}$

C. $3\hat{i}-\hat{j}+\hat{k}$

D. $3\hat{i}+\hat{j}+\hat{k}$

Answer: B

Watch Video Solution

70. Find the shortest distance between the lines

$$\vec{r}=\hat{i}+\hat{j}+\hat{k}+\lambda\left(3\hat{i}-\hat{j}\right) \text{ and } \vec{r}=4\hat{i}-\hat{k}+\mu\left(2\hat{i}+3\hat{k}\right)$$

A. (4,0,1)

B. (4,0,-1)

C. (-4,0,1)

D. (-4,0,-1)

Answer: B

Watch Video Solution

71. Show that the lines $\frac{x+1}{-10}=\frac{y+3}{-1}=\frac{z-4}{1}$ and $\frac{x+10}{-1}=\frac{y+1}{-3}=\frac{z-1}{4}$ intersect each other and find the coordinates of the points of intersection .

A. (11,4,5)

B. (-11,-4,-5)

C. (11,-4,5)

D. (-11,-4,5)

Answer: D

Watch Video Solution

72. The point of intersection of the lines $\frac{x-5}{3}=\frac{y-7}{-1}=\frac{z+2}{1}$ and $=\frac{x+3}{-36}=\frac{y-3}{2}=\frac{z-6}{4}$ is a. $\left(21,\frac{5}{3},\frac{10}{3}\right)$ b. $(2,10,4)$ c. $(-3,3,6)$ d. $(5,7,-2)$

A. (2,10,4)

B. (-3,3,6)

C. $(5, 7, -2)$

D. $\left(21, \frac{5}{3}, \frac{10}{3}\right)$

Answer: D

Watch Video Solution

73. If the lines $\frac{x-4}{15} = \frac{y-17}{9} = \frac{z-11}{8}$ and $\frac{x-15}{4} = \frac{y-9}{17} = \frac{z-8}{11}$ are intersecting at point A, then $OA^2 =$

A. $\sqrt{1398}$

B. $\sqrt{1390}$

C. 1398

D. 1390

Answer: C

Watch Video Solution

74. If the lines $\frac{x-1}{2}=\frac{y+1}{3}=\frac{z-1}{4} and \frac{x-3}{1}=\frac{y-k}{2}=\frac{z}{1}$ intersect, then find the value of k.

A. $-\frac{7}{2}$

B. $\frac{7}{2}$

C. $-\frac{9}{2}$

D. $\frac{9}{2}$

Answer: D

Watch Video Solution

75. If the straight lines $\frac{x-1}{k}=\frac{y-2}{2}=\frac{z-3}{3}$ and $\frac{x-2}{3}=\frac{y-3}{k}=\frac{z-1}{2}$ intersect at a point, then the integer k is equal to (1) -5 (2) 5 (3) 2 (4) -2

A. 2

B. -2

C. 5

D. -5

Answer: D

Watch Video Solution

76. Find the vector equation of a line parallel to the vector $2\hat{i} - \hat{j} + 2\hat{k}$ and passing through a point A with position vector $3\hat{i} + \hat{j} - \hat{k}$.

A. $13\hat{i} - 4\hat{j} - 9\hat{k}, 7\hat{i} - 6\hat{j} - 11\hat{k}$

B. $13\hat{i} + 4\hat{j} - 9\hat{k}, 7\hat{i} - 6\hat{j} + 11\hat{k}$

C. $13\hat{i} - 4\hat{j} + 9\hat{k}, \ -7\hat{i} + 6\hat{j} - 11\hat{k}$

D. $13\hat{i} + 4\hat{j} + 9\hat{k}, 7\hat{i} + 6\hat{j} - 11\hat{k}$

Answer: C

Watch Video Solution

77. Find the coordinates of the points on the line $\frac{x+1}{2} = \frac{y-2}{3} = \frac{z+3}{6}$, which are at a distance of 3 units from the point (-1 , 2 , -3).

A. $\left(\frac{1}{7}, -\frac{23}{7}, \frac{3}{7}\right), \left(\frac{13}{7}, -\frac{5}{7}, \frac{39}{7}\right)$

B. $\left(-\frac{1}{7}, \frac{23}{7}, -\frac{3}{7}\right), \left(\frac{13}{7}, -\frac{5}{7}, \frac{39}{7}\right)$

C. $\left(-\frac{1}{7}, \frac{23}{7}, -\frac{3}{7}\right), \left(-\frac{13}{7}, \frac{5}{7}, -\frac{39}{7}\right)$

D. $\left(\frac{1}{7}, -\frac{23}{7}, \frac{3}{7}\right), \left(-\frac{13}{7}, \frac{5}{7}, -\frac{39}{7}\right)$

Answer: C

Watch Video Solution

78. Find the two points on the line $\frac{x-2}{1} = \frac{y+3}{-2} = \frac{z+5}{2}$ on either side of $(2, -3, -5)$ which are at a distance of 3 units from it.

A. $(-3, -5, 3$ and $(1, -1, -7)$

B. $(3, -5, -3)$ and $(1, -1, -7)$

C. $(3, -5, -3)$ and $(-1, 1, -7)$

D. $(-3, -5, 3)$ and $(-1, 1, -7)$

Answer: B

Watch Video Solution

79. If AB=21, B $\equiv (-2, 1, -8)$ and the direction cosines of AB are $\frac{6}{7}, \frac{2}{7}, \frac{3}{7}$, then the co-ordinates of points in line PQ nearer to the origin at a distance of 14 units from A are

A. $(-16, -7, -1)$

B. $(-20, -5, 17)$

C. $(16, 7, 1)$

D. $(20, 5, 17)$

Answer: C

View Text Solution

80. A line passes through two points $A(2, -3, -1)$ and $B(8, -1, 2)$. The coordinates of a point on this lie at distance of 14 units from a are

A. (14,1,5), (-10,7,-7)

B. (14,1,5), (10,-7,-7)

C. (14,1,5), (-10,-7,7)

D. (14,1,5), (-10, -7,7)

Answer: D

Watch Video Solution

81. If the lines $x = a_1y + b_1, z = c_1y + d_1$ and $x = a_2y + b_2, z = c_2y + d_2$ are perpendicular, then

A. $a_1a_2 + b_1b_2 + 1 = 0$

B. $a_1a_2 + c_2c_2 + 1 = 0$

C. $a_1a_2 + b_1b_2 = 0$

D. $a_1c_2 + b_1c_1 = 0$

Answer: B

Watch Video Solution

82. If the lines $\frac{1-x}{3} = \frac{7y-14}{2\lambda} = \frac{z-3}{2}$ and $\frac{7-7x}{3\lambda} = \frac{y-5}{1} = \frac{6-z}{5}$ are at right angle, then the value of λ is

A. $\frac{70}{11}$

B. $\frac{10}{11}$

C. $-\frac{70}{11}$

D. $-\frac{10}{11}$

Answer: A

Watch Video Solution

83. If the lines $\frac{x-1}{-3}=\frac{y-2}{2k}=\frac{z-3}{-2}and\frac{x-1}{3k}=\frac{y-5}{1}=\frac{z-6}{-5}$ are at right angel, then find the value of k.

A. -10

B. $-\frac{7}{10}$

C. $-\frac{10}{7}$

D. $\frac{10}{7}$

Answer: C

Watch Video Solution

84. If the lines $x-2=ay-3=\frac{2-z}{3}$ and $bx+1=y+4=z$ are perpendicular to each other, then $\frac{1}{a}+\frac{1}{b}=$

A. 1

B. 0

C. 5

D. 3

Answer: D

Watch Video Solution

85. The lines $\frac{x-2}{1}=\frac{y-3}{1}=\frac{z-4}{-k}$ and $\frac{x-1}{k}=\frac{y-4}{2}=\frac{z-5}{1}$ are coplanar, if

A. $k=\pm 3$

B. $k=\pm 1$

C. $k=0,-1$

D. $k=0,-3$

Answer: D

Watch Video Solution

86. Find the angle between the pair of line: vecr=3hati+2hatu-4hatk+lamds(hati+2hatj+2hatk), vecr=5hati-2hatk+mu(3hati+2hatj+6hatk)`

A. $\cos^{-1}\left(\frac{21}{16}\right)$

B. $\cos^{-1}\left(\frac{19}{21}\right)$

C. $\cos^{-1}\left(\frac{21}{15}\right)$

D. $\cos^{-1}\left(\frac{15}{21}\right)$

Answer: B

Watch Video Solution

87. Find the angle between the following pair of line: $r = 2\hat{i} \equiv 5\hat{j} + \hat{k} + \lambda\left(3\hat{i} + 2\hat{j} + 6\hat{k}\right)$ and $\overrightarrow{r} = 7\hat{i} - 6\hat{k} + \mu\left(\hat{i} + 2\hat{j} + 2\hat{k}\right)$

A. $\cos^{-1}\left(\frac{19}{21}\right)$

B. $\cos^1\left(\frac{21}{19}\right)$

C. $\cos^{-1}\left(\frac{15}{21}\right)$

D. $\cos^{-1}\left(\frac{21}{15}\right)$

Answer: A

Watch Video Solution

88. Find the angle between the pair of lines

$\frac{x-1}{4}=\frac{y-3}{1}=\frac{z}{8}$ and $\frac{x-2}{2}=\frac{y+1}{2}=\frac{z-4}{1}$.

A. $\cos^{-1}\left(\frac{14}{27}\right)$

B. $\cos^{-1}\left(-\frac{14}{27}\right)$

C. $\cos^{-1}\left(\frac{2}{3}\right)$

D. $\cos^{-1}\left(-\frac{2}{3}\right)$

Answer: C

Watch Video Solution

89. The acute angle between the lines $\frac{x+4}{-1} = \frac{y-2}{2} = \frac{z-3}{2}$ and $\frac{x}{2} = \frac{y-1}{-2} = \frac{z+1}{1}$ is

A. $\cos^{-1}\left(\frac{4}{9}\right)$

B. $\cos^{-1}\left(-\frac{4}{9}\right)$

C. $\cos^{-1}\left(\frac{2}{9}\right)$

D. $\cos^{-1}\left(\frac{8}{9}\right)$

Answer: A

Watch Video Solution

90. The angle between the lines $\frac{x+1}{2} = \frac{y+3}{2} = \frac{z-4}{-1}$ and $\frac{x-4}{1} = \frac{y+4}{2} = \frac{z+1}{2}$ is

A. $\cos^{-1}\left(\frac{1}{9}\right)$

B. $\cos^{-1}\left(\frac{2}{9}\right)$

C. $\cos^{-1}\left(\frac{3}{9}\right)$

D. $\cos^{-1}\left(\frac{4}{9}\right)$

Answer: D

Watch Video Solution

91. The angle between the lines $\frac{x-1}{1}=\frac{y-1}{1}=\frac{z-1}{2}$ and $\frac{x-1}{-\sqrt{3}-1}=\frac{y-1}{\sqrt{3}-1}=\frac{z-1}{4}$ is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{4}$

D. $\frac{\pi}{2}$

Answer: B

Watch Video Solution

92. The angle between the lines $2x = 3y = -z$ and $6x = -y = -4z$ is

A. 0°

B. 30°

C. 45°

D. 90°

Answer: D

Watch Video Solution

93. Find the angle between the following pair of lines: A lines with direction ratios 2,2,1 A line joning (3,1,4)to (7,2,12)

A. $\cos^{-1}\left(\frac{1}{3}\right)$

B. $\cos^{-1}\left(\frac{2}{3}\right)$

C. $\cos^{-1}\left(\frac{3}{3}\right)$

D. $\cos^{-1}\left(\frac{4}{3}\right)$

Answer: B

Watch Video Solution

94. The acute angle between the line joining the points A(2,1,-3), B(1,-1,2) and the line $\vec{r} = \left(2\hat{i} - \hat{k}\right) + \lambda\left(3\hat{i} + \hat{j}\right)$ is

A. $\cos^{-1}\left(\frac{1}{2\sqrt{3}}\right)$

B. $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$

C. $\cos^{-1}\left(\frac{1}{5\sqrt{10}}\right)$

D. $\cos^{-1}\left(\frac{3}{5\sqrt{10}}\right)$

Answer: A

Watch Video Solution

95. The angle between the lines $r = \left(2\hat{i} + \hat{j} - 3\hat{k}\right) + \lambda\left(\hat{i} - \hat{j} + \hat{k}\right), \frac{x-1}{1} = \frac{y+2}{3} = \frac{z+3}{2}$ is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{2}$

Answer: D

Watch Video Solution

96. The angle between the lines whose direction cosines are proportional to (1,2,1) and (2,-3,6) is

A. $\cos^{-1}\left(\frac{1}{7\sqrt{6}}\right)$

B. $\cos^{-1}\left(\frac{2}{7\sqrt{6}}\right)$

C. $\cos^{-1}\left(\frac{3}{7\sqrt{6}}\right)$

D. $\cos^{-1}\left(\frac{4}{7\sqrt{6}}\right)$

Answer: B

Watch Video Solution

97. The angle made by line AB with perpendicular of co-ordinates axes if $A \equiv \left(0, \sqrt{3}, 0\right)$ and $B \equiv (0, 0, -1)$ are

A. $\frac{\pi}{3}, \frac{\pi}{4}, \frac{\pi}{2}$

B. $\frac{3\pi}{4}, \frac{\pi}{2}, \frac{\pi}{3}$

C. $\frac{\pi}{2}, \frac{5\pi}{6}, \frac{2\pi}{3}$

D. $\frac{\pi}{2}, \frac{2\pi}{3}, \frac{5\pi}{6}$

Answer: C

Watch Video Solution

98. $A91, 0, 4), B(0, -11, 3), C(2, -3, 1)$ are three points and D is the foot of perpendicular from A to BC. Find the coordinates of D.

A. $\left(\frac{99}{53}, \frac{187}{53}, \frac{95}{53}\right)$

B. $\left(\frac{95}{53}, \frac{187}{53}, \frac{99}{53}\right)$

C. $\left(\frac{99}{53}, -\frac{187}{53}, \frac{95}{53}\right)$

D. $\left(\frac{95}{53}, -\frac{187}{53}, \frac{99}{53}\right)$

Answer: C

Watch Video Solution

99. Find the length of the perpendicular from (3,2,1) to the line $\frac{x-7}{-2} = \frac{y-7}{2} = \frac{z-6}{3}$.

A. (9,5,)

B. (9,-5,3)

C. (9,5,-3)

D. (-9,5,3)

Answer: A

Watch Video Solution

100. Find the length of the perpendicular from (3,2,1) to the line $\frac{x-7}{-2}=\frac{y-7}{2}=\frac{z-6}{3}$.

A. 3

B. 2

C. 7

D. 6

Answer: C

Watch Video Solution

101. The foot of the perpendicular drawn from point (2,-3,1) to the line $\frac{x+1}{2} = \frac{y-3}{3} = \frac{z+2}{-1}$ is

A. $\left(-\frac{22}{14}, -\frac{3}{14}, -\frac{13}{14}\right)$

B. $\left(-\frac{22}{7}, -\frac{3}{14}, -\frac{13}{4}\right)$

C. $\left(\frac{22}{14}, \frac{3}{14}, \frac{13}{14}\right)$

D. $\left(\frac{22}{7}, \frac{3}{14}, \frac{13}{14}\right)$

Answer: B

Watch Video Solution

102. Find the length of the perpendicular from (3,2,1) to the line $\frac{x-7}{-2} = \frac{y-7}{2} = \frac{z-6}{3}$.

A. $\sqrt{\frac{531}{14}}$

B. $\sqrt{\frac{531}{98}}$

C. $\sqrt{\frac{1779}{98}}$

D. $\sqrt{\frac{1779}{49}}$

Answer: A

Watch Video Solution

103. 2/ Find the perpendicular distance of the point (1, 0, 0) from the line $\frac{x-1}{2}=\frac{y+1}{-3}=\frac{z+10}{8}$Also, and the coordinates of the foot of the perpendicular and the equation of the perpendicular.

A. $(-3, -4, -2)$

B. $(3, -4, -2)$

C. $(3, 4, -2)$

D. $(3, 4, 2)$

Answer: B

Watch Video Solution

104. Find the perpendicular distasnce of the point (1,0,0) from the lines (x-1)/2=(y+1)/(-3)=(z+10)/8`

A. $4\sqrt{3}$

B. $3\sqrt{6}$

C. $6\sqrt{2}$

D. $2\sqrt{6}$

Answer: D

Watch Video Solution

105. Find the foot of the perpendicular from the point $(0, 2, 3)$ on the line $\frac{x+3}{5} = \frac{y-1}{2} = \frac{z+4}{3}$. Also, find the length of the perpendicular.

A. (2,3,-1)

B. (2,-3,1)

C. (-2,3,1)

D. (2,3,1)

Answer: A

Watch Video Solution

106. Find the image of the point $(0, 2, 3)$ in the line $\frac{x+3}{5} = \frac{y-1}{2} = \frac{z+4}{3}$.

A. 21

B. 42

C. $\sqrt{21}$

D. $\sqrt{42}$

Answer: C

Watch Video Solution

107. The position vector of the foot of the perpendicular draw from the point $2\hat{i} - \hat{j} + 5\hat{k}$ to the line $\vec{r} = \left(11\hat{i} - 2\hat{j} - 8\hat{k}\right) + \lambda\left(10\hat{i} - 4\hat{j} - 11\hat{k}\right)$ is

A. (3,2,1)

B. (1,2,3)

C. (2,1,3)

D. (1,3,2)

Answer: B

Watch Video Solution

108. The position vector of the foot of the perpendicular draw from the point $2\hat{i} - \hat{j} + 5\hat{k}$ to the line $\vec{r} = \left(11\hat{i} - 2\hat{j} - 8\hat{k}\right) + \lambda\left(10\hat{i} - 4\hat{j} - 11\hat{k}\right)$ is

A. 1

B. 2

C. 3

D. $\sqrt{14}$

Answer: D

Watch Video Solution

109. Find the length of the perpendicular drawn from the point (5, 4, -1) to the line $\vec{r} = \hat{i} + \lambda\left(2\hat{i} + 9\hat{j} + 5\hat{k}\right)$, where λ is a parameter.

A. $\frac{\sqrt{231900}}{110}$

B. $\frac{\sqrt{23199}}{110}$

C. $\frac{\sqrt{231990}}{11}$

D. $\frac{\sqrt{23199}}{11}$

Answer: A

Watch Video Solution

110. Find the shortest distance between the following lines :

(i) $\vec{r} = 4\hat{i} - \hat{j} + \lambda\left(\hat{i} + 2\hat{j} - 3\hat{k}\right)$ and

$\vec{r} = \hat{i} - \hat{j} + 2\hat{k} + \mu\left(2\hat{i} + 4\hat{j} - 5\hat{k}\right)$

(ii) $\vec{r} = -\hat{i} + \hat{j} - \hat{k} + \lambda\left(\hat{i} + \hat{j} - \hat{k}\right)$ and

$\vec{r} = \hat{i} - \hat{j} + 2\hat{k} + \mu\left(-\hat{i} + 2\hat{j} + \hat{k}\right)$

(iii) $\frac{x-1}{-1} = \frac{y+2}{1} = \frac{z-3}{-2}$ and

$\frac{x-1}{1} = \frac{y+1}{2} = \frac{z+1}{-2}$

(iv) $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-5}{5}$

(v) $\vec{r} = \vec{i} + 2\hat{j} + 3\hat{k} + \lambda\left(\hat{i} - \hat{j} + \hat{k}\right)$ and

$\vec{r} = 2\hat{i} - \hat{j} - \hat{k} + \mu\left(-\hat{i} + \hat{j} - \hat{k}\right)$

A. $\frac{2}{\sqrt{3}}$

B. $\frac{\sqrt{3}}{2}$

C. $\frac{1}{2\sqrt{3}}$

D. $\frac{1}{\sqrt{3}}$

Answer: D

Watch Video Solution

111. Find the shortest distance between the lines $\vec{r} = \left(\hat{i}i + 2\hat{j} + \hat{k}\right) + \lambda\left(2\hat{i} + \hat{j} = 2\hat{k}\right)$ and $\vec{r} = 2\hat{i} - \hat{j} - \hat{k} + \mu\left(2\hat{i} + \hat{j}\right.$

.

A. $\frac{3}{\sqrt{2}}$

B. $\frac{2}{\sqrt{3}}$

C. $\frac{1}{3\sqrt{2}}$

D. $\frac{1}{2\sqrt{3}}$

Answer: A

Watch Video Solution

112. The shortest distance between the lines

$\vec{r} = \left(2\hat{i} - \hat{j}\right) + \lambda\left(2\hat{i} + \hat{j} - 3\hat{k}\right)$

$\vec{r} = \left(\hat{i} - \hat{j} + 2\hat{k}\right) + \lambda\left(2\hat{i} + \hat{j} - 5\hat{k}\right)$

A. $\frac{1}{2\sqrt{5}}$

B. $\frac{1}{4\sqrt{5}}$

C. $\frac{1}{\sqrt{5}}$

D. $\frac{2}{\sqrt{5}}$

Answer: C

Watch Video Solution

113. The shortest distance between the lines $\vec{r} = \left(-\hat{i} - \hat{j}\right) + \lambda\left(2\hat{i} - \hat{k}\right)$ and $\vec{r} = \left(2\hat{i} - \hat{j}\right) + \mu\left(\hat{i} + \hat{j} - \hat{k}\right)$ is

A. $\frac{1}{\sqrt{7}}$

B. $\frac{1}{\sqrt{14}}$

C. $\frac{1}{2\sqrt{7}}$

D. $\frac{1}{7\sqrt{2}}$

Answer: B

Watch Video Solution

114. Find the shortest distance between the lines $\frac{x+1}{7} = \frac{y+1}{-6}$ and $\frac{x-3}{1} = \frac{y-5}{-2} = \frac{z-7}{1}$.

A. $2\sqrt{29}$

B. $\sqrt{29}$

C. $3\sqrt{29}$

D. $4\sqrt{29}$

Answer: A

Watch Video Solution

115. Find the shortest distance between the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4} and \frac{x-2}{3} = \frac{y-4}{4} = \frac{z-5}{5}$.

A. $\frac{2}{\sqrt{6}}$

B. $\frac{1}{\sqrt{6}}$

C. $2\sqrt{6}$

D. $\sqrt{6}$

Answer: B

Watch Video Solution

116. The shortest distance between the lines $\frac{x-5}{4} = \frac{y-7}{-5} = \frac{z+3}{-5}$ and $\frac{x-8}{7} = \frac{y-7}{1} = \frac{z-5}{3}$ is

A. $\frac{342}{\sqrt{3830}}$

B. $\frac{171}{\sqrt{3830}}$

C. $\frac{282}{\sqrt{3830}}$

D. $\frac{141}{\sqrt{3830}}$

Answer: C

Watch Video Solution

117. If OA=a, OB=b, OC=c are the co-terminus edges of regular parallelopiped, then the shortest distance between the diagonal and the side OA not meeting the diagonal is

A. $\frac{bc}{\sqrt{b^2+c^2}}$

B. $\frac{ca}{\sqrt{c^2+a^2}}$

C. $\frac{ab}{\sqrt{a^2+b^2}}$

D. $\frac{abc}{\sqrt{a^2+b^2+c^2}}$

Answer: A

View Text Solution

118. If OA=a, OB=b, OC=c are the co-terminus edges of regular parallelopiped, then the shortest distance between the diagonal and the side OB not meeting the diagonal is

A. $\frac{bc}{\sqrt{b^2+c^2}}$

B. $\frac{ca}{\sqrt{c^2+a^2}}$

C. $\frac{ab}{\sqrt{a^2+b^2}}$

D. $\frac{abc}{\sqrt{a^2+b^2+c^2}}$

Answer: B

View Text Solution

119. Prove that the shortest distance between the diagonals of a rectangular parallelopiped whose coterminous sides are a, b, c and the edges not meeting it are

A. $\frac{bc}{\sqrt{b^2+c^2}}$

B. $\frac{ca}{\sqrt{c^2+a^2}}$

C. $\frac{ab}{\sqrt{a^2+b^2}}$

D. $\frac{abc}{\sqrt{a^2+b^2+c^2}}$

Answer: C

Watch Video Solution

120. The line $\vec{r} = \left(8\vec{-}9\vec{b} + 10\vec{c}\right) + \lambda\left(3\vec{a} - 16\vec{b} + 7\vec{c}\right)$ and $\vec{r} = \left(15\vec{a} + 29\vec{b} + 5\vec{c}\right) + \mu\left(3\vec{a} + 8\vec{b} - 5\vec{c}\right)$ are

A. coplanar

B. non-collinear

C. parallel

D. perpendicular

Answer: B

Watch Video Solution

121. The lines given by $\vec{r} = \left(\hat{i} - \hat{j}\right) + \lambda\left(2\hat{i} + \hat{k}\right)$ and $\vec{r} = \left(2\hat{i} - \hat{j}\right) + \mu\left(\hat{i} + \hat{j} - \hat{k}\right)$ are

A. parallel

B. perpendicular

C. skew

D. intersecting

Answer: C

View Text Solution

122. The lines $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ and $\frac{x-1}{-2} = \frac{y-2}{-4} = \frac{z-3}{-6}$ are

A. perpendicular

B. coincident

C. intersecting

D. skew

Answer: B

Watch Video Solution

123. If a,b,c and $\frac{1}{bc}, \frac{1}{ca}, \frac{1}{ab}$ are the direction ratio of two lines, then the lines are

A. mutually perpendicular

B. skew

C. coincident

D. intersecting

Answer: C

Watch Video Solution

124. The lines $\frac{x-1}{2} = \frac{y-2}{4} = \frac{z-3}{6}$ and $\frac{x-1}{4} = \frac{y-2}{5} = \frac{z-3}{7}$ are

A. perpendicular

B. parallel

C. intersecting

D. skew

Answer: C

View Text Solution

125. Distance of the point $P(x_2, y_2, z_2)$ from the line $\frac{x - x_1}{l} = \frac{y - y_1}{m} = \frac{z - z_1}{n}$, where l, m, n are the direction cosines of the line, is

A. $\sqrt{(x_2 - x_1)l + (y_2 - y_1)m + (z_2 - z_1)n}$

B. $\sqrt{(x_2 - x_1)^2 l + (y_2 - y_1)^2 m + (z_2 - z_1)^2 n}$

C. $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$

D. $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2 - l(x_1 - x_2) + m(y_1 - y_2) +$

Answer: D

Watch Video Solution

126. The equation of line equally inclined to coordinate axes and passing through (-3,2,-5) is

A. $\frac{x+3}{1}=\frac{y-2}{1}=\frac{z+5}{1}$

B. $\frac{x+3}{-1}=\frac{y-2}{1}=\frac{5+z}{-1}$

C. $\frac{x+3}{-1}=\frac{y-2}{1}=\frac{z+5}{1}$

D. $\frac{x+3}{-1}=\frac{2-y}{1}=\frac{z+5}{-1}$

Answer: B

Watch Video Solution

127. The lines $\frac{x-1}{2}=\frac{y+1}{2}=\frac{z-1}{4}$ and $\frac{x-3}{1}=\frac{y-k}{2}=\frac{z}{1}$ intersect each other at point

A. $(-2,\ -4, 5)$

B. $(-2, -4, -5)$

C. $(2, 4, -5)$

D. $(2, -4, -5)$

Answer: B

Watch Video Solution

MCQs

1. L.P.P. is a process of finding

A. maximum value of objective function

B. minimum value of objective function

C. optimal value of objective function

D. only maximum value of objective function

Answer: C

View Text Solution

2. Optimization of the objective function is a process of

A. maximizing the objective function

B. maximizing or minimizing the objective function

C. minimizing the objective function

D. only minimizing the objective function

Answer: B

View Text Solution

3. Objective function of an LPP is

A. a constraint

B. a function to be optimised

C. a relation between the variable

D. feasible region

Answer: B

Watch Video Solution

4. The function to be optimized is called

A. an objective function

B. the constraint

C. the non-negative constraint

D. an inequality

Answer: A

View Text Solution

5. Which of the following statement is correct ?

A. A L.P.P admits a unique solution

B. Every L.P.P. does not admits an optimal solution

C. If a L.P.P. admits two optimal solution, then it has infinite number of optimal solution

D. A L.P.P. admits two optimal solution.

Answer: C

Watch Video Solution

6. The optimal value of the objective function is attained at the points

A. given by intersection of inequations with axes only

B. given by by intersection of inequations with X-axis only

C. given by corner points of the feasible region

D. given by corner points

Answer: C

Watch Video Solution

7. The maximum or minimum of the objective funtion occurs only at the corner points of the feasible region. This theorem is known as fundamental theorem of

A. Algebra

B. Arithmetic

C. Calculus

D. Extreme point

Answer: D

View Text Solution

8. Corner points of fealible region of inequalities gives

A. an optiomal solution of L.P.P.

B. an objective function

C. the constraints.

D. the linear assumption.

Answer: A

View Text Solution

9. The feasible solution of a LPP belongs to

A. first and second

B. first and third

C. only second

D. only first

Answer: D

Watch Video Solution

10. L.P.P. has constraints of

A. one variables

B. two variables

C. one or two variables

D. two or more variables

Answer: D

View Text Solution

11. If the constraints in a linear programming problem are changed

A. the problem is to be re-evaluated

B. solution is not defined

C. the objective function has to be modify

D. the changes in constraints ignored

Answer: A

Watch Video Solution

12. Which of the following statement is incorrect

A. Maximize the objective function when more than one optimal solution is obtained

B. Maximize the objective function when the feasible region is unbounded

C. Maximize the objective function when the feasible region is bounded

D. If a L.P.P. admits two optimal solution, then it has infinite number of optimal solution

Answer: B

Watch Video Solution

13. Minimize $z = \sum_{j=1}^{n} \sum_{i=1}^{m} c_{ij} x_{ij}$, subject to

$\sum + (i = 1)^n x_{ij} = a_i, i = 1, 2, \ldots m$ and

$\sum_{i=1}^{m} x_{ij} = a_i, i = 1, 2, \ldots n$ js a L.P.P. with number of constraints

A. $m + n$

B. $m - n$

C. mn

D. $\frac{m}{n}$

Answer: A

Watch Video Solution

14. Region represented by the inequalities $x \geq 0, y \geq 0$ is

A. first quadrant

B. second quadrant

C. third quadrant

D. fourth quadrant

Answer: A

Watch Video Solution

15. Solution set of the inequality $x \geq 0$ is

A. half plane on the left of Y-axis

B. half plane on the right of Y-axis excluding Y-axis

C. half plane on the right of Y-axis including the points on Y-axis

D. half plane on the left of Y-axis including the points on Y-axis

Answer: C

Watch Video Solution

16. Solution set of the inequality $y \leq 0$ is

A. half plane below X-axis excluding the points on X-axis

B. half plane below X-axis including the points on X-axis

C. half plane above X-axis

D. half plane above X-axis including the points on X-axis

Answer: B

Watch Video Solution

17. Which of the term is not used in a linear programming problem ?

A. Slack variable

B. Objective funciton

C. Concave region

D. Feasible region

Answer: C

Watch Video Solution

18. A set is said to be convex if

A. all points except the end points of the segment inside the set lie inside the set

B. it is concave

C. all points on segment in the set lie inside the set

D. all points on segment in the set lie outside the set

Answer: C

Watch Video Solution

19. Which of the following set is convex?

A. $\{(x, y) : x^2 + y^2 \geq 1\}$

B. $\{(x, y) : y^2 \geq x\}$

C. $\{(x, y) : 3x^2 + 4y^2 \geq 5\}$

D. $\{(x, y) : y \geq 2, y \leq 4\}$

Answer: D

Watch Video Solution

20. Which of the following set is not a convex set?

A. $\{(x, y) : 1 \leq x^2 + y^2 \leq 3\}$

B. $\{(x, y) : x^2 + y^2 \leq 2\}$

C. $\{(x, y) : x + y \leq 1\}$

D. $\{(x, y) : 2x^2 + 3y^2 \leq 6\}$

Answer: A

Watch Video Solution

21. which of the following is not a convex set?

A. $\{(x, y) : 2x + 2y \leq 7\}$

B. $\{(x, y) : x^2 + y^2 \leq 4\}$

C. $\{x : |x| = 5\}$

D. $\{(x, y) : 2x^2 + 3y^2 \leq 6\}$

Answer: C

View Text Solution

22. The maximum value of $z = 11x + 8y$ subject to $x \leq 4, x + y \leq 6, x \geq 0, y \geq 0$ is

A. 0

B. 48

C. 60

D. 44

Answer: C

Watch Video Solution

23. Maximize :

$z = 3x + 5y$

Subject to : $x + 4y \leq 24$

$3x + y \leq 21$

$x + y \leq 9$

$x \geq 0, y \geq 0$

A. 21

B. 37

C. 33

D. 30

Answer: B

Watch Video Solution

24. The maximum value of $z = 4x + 6y$ subject to $3x + 2y \leq 12, x + y \geq 4, x \geq 0, y \geq 0$ is

A. 36

B. 16

C. 24

D. 38

Answer: A

Watch Video Solution

25. The maximum value of $z = 7x + 11y$ subject to $3x + 5y \leq 26, 5x + 3y \leq 30, x \geq 0, y \geq 0,$ is

A. 42

B. 57.2

C. 61.6

D. 59

Answer: D

Watch Video Solution

26. The maximum value of $z = 6x + 4y$ subject to $x \leq 2, x + y \leq 3, -2x + y \leq 1, x \geq 0, y \geq 0,$ is

A. 13

B. 16

C. 13.33

D. 16.33

Answer: B

Watch Video Solution

27. The minimum value of z = 10x + 25y subject to $0 \leq x \leq 3, 0 \leq y \leq 3, x + y \leq 5$ is .....

A. 75

B. 80

C. 95

D. 105

Answer: C

Watch Video Solution

28. The maximum value of $z = 75x + 50y$ subject to $8x + 5y \leq 60, 4x + 5y \leq 40, x \geq 0, y \geq 0$ is

A. 400

B. 562.5

C. 575.5

D. 575

Answer: D

Watch Video Solution

29. Maximise $Z = 5x + 3y$

Subject to $3x + 5y \leq 15, 5x + 2y \leq 10, x \geq 0, y \geq 0.$

A. 10

B. 0

C. 6

D. 12

Answer: A

Watch Video Solution

30. Maximise $Z = 5x + 3y$

Subject to $3x + 5y \leq 15, 5x + 2y \leq 10, x \geq 0, y \geq 0.$

A. at one point only

B. at two points only

C. at infinite number of points

D. at three points only

Answer: C

Watch Video Solution

31. The maximum value of $z = 15x + 30y$ subject to $3x + y \leq 12, x + 2y \leq 10, x \geq 0, y \geq 0$ is

A. 60

B. 150

C. 160

D. 100

Answer: B

Watch Video Solution

32. The objective function $z = 15x + 30y$ subject to $3x + y \leq 12, x + 2y \leq 10, x \geq 0, y \geq 0,$ can be maximized

A. at infinite number of points

B. at two points only

C. at one points only

D. at three points only

Answer: A

Watch Video Solution

33. The maximum value of $z = x + y$ subject to $x + y \leq 10, 3x - 2y \leq 15, x \leq 6, x \geq 0, y \geq 0$ is

A. 5

B. 7.5

C. 12

D. 10

Answer: D

Watch Video Solution

34. The objective function $z = x + y$ subject to $x + y \leq 10, 3x - 2y \leq 15, x \leq 6, x \geq 0, y \geq 0$ can be maximized

A. at one point only

B. at two points only

C. at infinite number of points

D. at three points only

Answer: C

Watch Video Solution

35. The objective function $z = x_1 + x_2$, subject to $x_1 + x_2 \leq 10, -2x_1 + 3x_2 \leq 15, x_1 \leq 6, x_1, x_2 \leq 0$ has maximum value of the feasible region.

A. 5

B. 7.5

C. 12

D. 10

Answer: D

Watch Video Solution

36. The objective function $z = x_1 + x_2$, subject to $x_1 + x_2 \leq 10, -2x_1 + 3x_2 \leq 15, x_1 \leq 6, x_1, x_2 \leq 0$ has maximum value of the feasible region.

A. at one point only

B. at two points only

C. at every point of the segment joining two points

D. at every point of the line joining two points

Answer: C

Watch Video Solution

37. The objective function $z = 4x + 3y$ subject to $3x + 4y \leq 24, 8x + 6y \leq 48, x \leq 5, y \leq 6, x \geq 0, y \geq 0$ can be maximized

A. at only one point

B. at two points only

C. at infinite number of points

D. at three points only

Answer: C

Watch Video Solution

38. The maximum value of Z is where, Z=4x+2 subject to constraints 4x+2y $\geq$ 46, x+3y ≤ 24 and $x, y \geq 0$, is

A. exactly one point

B. two point

C. three point

D. infinite number of points

Answer: D

Watch Video Solution

39. By graphical method, the solutions of linear programming problem maximise $Z = 3x_1 + 5x_2$ subject to constraints $3x_1 + 2x_2 \leq 18, x_1 \leq 4, x_2 \leq 6 x_1 \geq 0, x_2 \geq 0$ are

A. $x_1 = 2, x_2 = 0, z = 6$

B. $x_1 = 2, x_2 = 6, z = 36$

C. $x_1 = 4, x_2 = 3, z = 27$

D. $x_1 = 4, x_2 = 6, z = 42$

Answer: B

Watch Video Solution

40. The point for which the maximum value of z=x+y subject to the constraints $2x + 5y \leq 100, \frac{x}{25} + \frac{y}{50} \leq 1, x \geq 0, y \geq 0$ is obtained at

A. (10,20)

B. (25,0)

C. (0,20)

D. $\left(\frac{75}{4}, \frac{25}{2}\right)$

Answer: D

Watch Video Solution

41. The minimum value of $z = 20x + 20y$ subject to $x + 2y \geq 8, 3x + 2y \geq 15, 5x + 2y \geq 20, x \geq 0, y \geq 0$ is

A. 115

B. 125

C. 105

D. 200

Answer: A

Watch Video Solution

42. The minimum value of $z = 6x + 21y$ subject to $x + 2y \geq 3, x + 4y \geq 4, 3x + y \geq 3, x \geq 0, y \geq 0$ is

A. 20.5

B. 28.8

C. 24

D. 22.5

Answer: D

Watch Video Solution

43. The minimum value of $z = 20x + 9y$ subject to $2x + y \geq 36, 6x + y \geq 60, x \geq 0, y \geq 0$ is

A. 330

B. 336

C. 360

D. 333

Answer: B

Watch Video Solution

44. The minimum value of $z = 7x + y$ subject to $5x + y \geq 5, x + y \geq 3, x \geq 0, y \geq 0$ is

A. 5

B. 2.5

C. 6

D. 3.5

Answer: A

Watch Video Solution

45. The minimum value of $z = 8x + 10y$ subject to $2x + y \geq 7, 2x + 3y \geq 15, y \geq 2, x \geq 0, y \geq 0$ is

A. 56

B. 52

C. 51

D. 48

Answer: B

Watch Video Solution

46. The minimum value of $z = 6x + 2y$ subject to $5x + 9y \leq 90, x + y \geq 4, y \leq 8, x \geq 0, y \geq 0$ is

A. 24

B. 6

C. 8

D. 16

Answer: C

Watch Video Solution

47. The objective function, $z = 4x_1 + 5x_2$, subject to $2x_1 + x_2 \geq 7, 2x_1 + 3x_2 \leq 15, x_2 \leq 3, x_1, x_2 \geq 0$ has minimum value at the point

A. on X-axis

B. on Y-axis

C. at the origin

D. on the line parallel to X-axis

Answer: A

Watch Video Solution

48. The minimum value of $z = 3x + 5y$ subject to $2x + 3y \geq 12, \ -x + y \leq 3, x \leq 4, y \geq 3$ is

A. 19.8

B. 19.5

C. 19.4

D. 19.6

Answer: A

Watch Video Solution

49. The minimum value of $z = 8x + 4y$ subject to $x + 2y \geq 2, 3x + y \geq 3, 4x + 3y \geq 6, x \geq 0, y \geq 0$ is

A. 9.8

B. 11.2

C. 9.6

D. 12

Answer: C

Watch Video Solution

50. The minimum value of $z = 2x + 4y$ subject to $x + 2y \geq 2, 3x + 2y \geq 6, x \geq 0, y \geq 0$ is

A. 4

B. 6

C. 3

D. 12

Answer: A

Watch Video Solution

51. The objective function $z = 2x + 4y$ subject to $2x + y \geq 3, x + 2y \geq 6, x \geq 0y \geq 0$ can be minimized

A. at infinite number of points

B. at two points only

C. at one points only

D. at three points only

Answer: A

Watch Video Solution

52. The minimum value of $z = x + 2y$ subject to $x + 2y \geq 50, 2x - y \leq 0, 2x + y \leq 100, x \geq 0, y \geq 0$ is

A. 10

B. 30

C. 40

D. 50

Answer: D

Watch Video Solution

53. The objective function $z = x + 2y$ subject to $x + 2y \geq 50, 2x - y \leq 0, 2x + y \leq 100, x, y \geq 0$ can be minimized

A. at infinite number of points

B. at two points only

C. at one points only

D. at three points only

Answer: A

Watch Video Solution

54. Minimize $z = 6x + 4y$, subject to

$3x + 2y \geq 12, x + y \geq 5, 0 \leq x \leq 4, 0 \leq y \leq 4.$

A. 22

B. 24

C. 40

D. 28

Answer: B

Watch Video Solution

55. The objective function $z = 6x + 4y$ subjective to $3x + 2y \geq 12, x + y \geq 5, 0 \leq x \leq 4, 0 \leq y \leq 4$ can be minimized

A. at one point only

B. at two points only

C. at infinite number of points

D. at three points only

Answer: C

Watch Video Solution

56. The co-ordinates of the point for minimum value z = 7x - 8y subject to the conditons $x + y - 20 \leq 0, y \geq 5, x \geq 0,$ is

A. (20,0)

B. (15,5)

C. (0,5)

D. (0,20)

Answer: D

Watch Video Solution

57. The constraints $x + y \geq 5, x + 2y \geq 6, x \geq 3, y \geq 0$ and the objective function $z = -x + 2y$ has

A. unbounded solution

B. concave solution

C. bounded solution

D. unique solution

Answer: A

Watch Video Solution

58. The constraints $x - y \leq 1, x - y \geq 0, x \geq 0, y \geq 0,$ and the objective function $z = x + y$ has

A. unbounded solution

B. concave solution

C. bounded solution

D. unique solution

Answer: A

Watch Video Solution

59. The constraints $3x + 2y \geq 9, x - y \leq 3, x \geq 0, y \geq 0$ and the objective function $z = 4x + 2y$ has

A. unbounded solution

B. concave solution

C. bounded solution

D. unique solution

Answer: A

Watch Video Solution

60. The constraints $x - y \geq 0, \ -x + 3y \leq 3, x \geq 0, y \geq 0$ and the objective function $z = 6x + 8y$ has

A. unbounded solution

B. concave solution

C. bounded solution

D. unique solution

Answer: A

Watch Video Solution

61. The constraints $-x + y \leq 1, \ -x + 3y \leq 9, x \geq 0, y \geq 0$ defines

A. bounded feasible region

B. unbounded feasible region

C. both bounded and unbounded region

D. unique solution

Answer: B

Watch Video Solution

62. The area of the feasible region for the following constraints $3y + x \geq 3, x \geq 0, y \geq 0$ will be

A. bounded

B. unbounded

C. convex

D. concave

Answer: B

Watch Video Solution

63. The constraints $x + y \geq 8, 3x + 5y \leq 15, x \geq 0, y \geq 0$ and the objective function $z = 1.5x + y$ has

A. concave solution

B. no unique solution

C. bounded solution

D. unique solution

Answer: B

Watch Video Solution

64. The constraints $x + y \leq 8, 2x + 3y \leq 12, x \geq 0, y \geq 0$ and the objective function $z = 4x + 6y$ has

A. concave solution

B. no unique solution

C. bounded solution

D. unique solution

Answer: B

Watch Video Solution

65. The constraints $x + 2y \leq 2, 2x + 4y \geq 8, x \geq 0, y \geq 0$ and the objective function $z = 7x - 3y$ has

A. concave solution

B. no unique solution

C. bounded solution

D. unique solution

Answer: B

Watch Video Solution

66. The constraints $x - y \geq 0, -2x + y \geq 2, x \geq 2, x \geq 0, y \geq 0$ and the objective function $z = 4x + 5y$ has

A. concave solution

B. no solution

C. bounded solution

D. unique solution

Answer: B

Watch Video Solution

67. Solution set of inequalities $x - 2y \geq 0, \ -2x - y + 2 \leq 0, x \geq 0, y \geq 0$

A. empty

B. closed half plane

C. infinite

D. first quadrant

Answer: C

Watch Video Solution

68. The region represented by the inequations $2x + 3y \leq 18, x + y \geq 10, x \geq 0, y \leq 0$ is

A. a polygon

B. unbounded

C. bonded

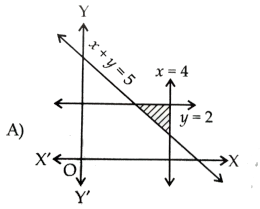
D. null region

Answer: B

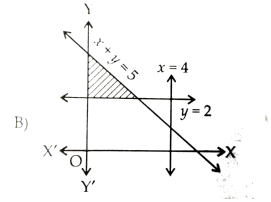
Watch Video Solution

69. Shaded region of the constraints $x + y \leq 5, 0 \leq x \leq 4, 0 \leq y \leq 2$ is

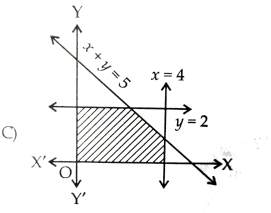
A.



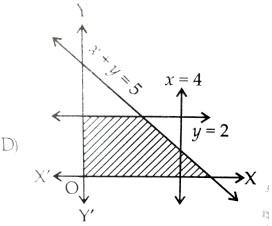
B.



C.



D.

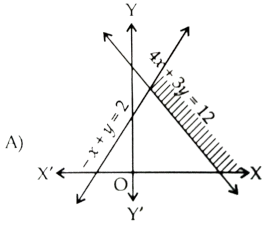


Answer: C

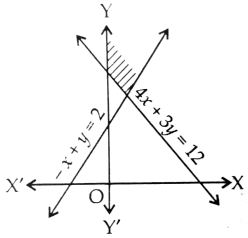
Watch Video Solution

70. Shaded, region of the constraints $4x + 3y \leq 12, \ -x + y \leq 2, x \geq 0, y \geq 0$ is

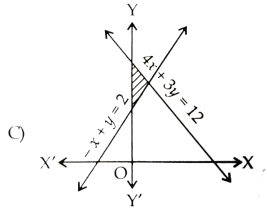
A.



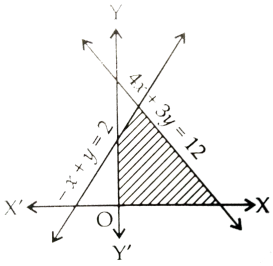
B.



C.



D.

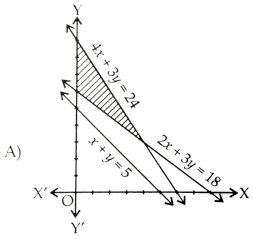


Answer: D

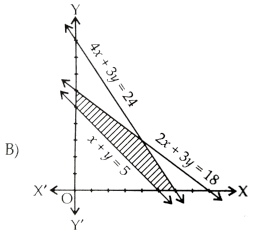
Watch Video Solution

71. Shaded, region of the constraints $x + y \geq 5, 2x + 3y \leq 18, 4x + 3y \leq 24, x \geq 0, y \geq 0$ is

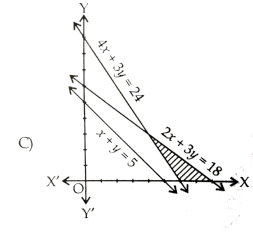
A.



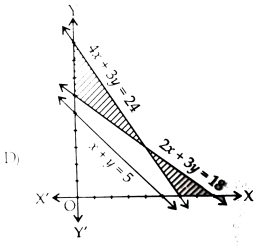
B.



C.



D.

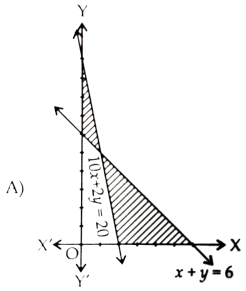


Answer: B

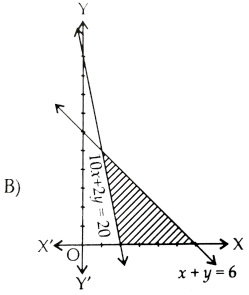
Watch Video Solution

72. Shaded, region of the constraints $10x + 2y \geq 20, x + y \geq 6$ is

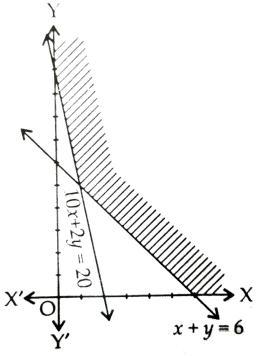
A.



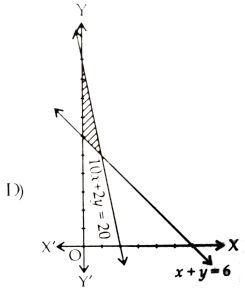
B.



C.



D.

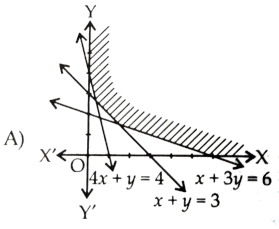


Answer: C

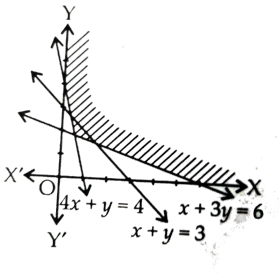
Watch Video Solution

73. Shaded,region of the constraints $4x + y \geq 4, x + 3y \geq 6, x + y \geq 3, x \geq 0, y \geq 0$ is

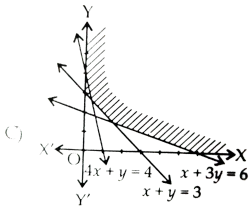
A.



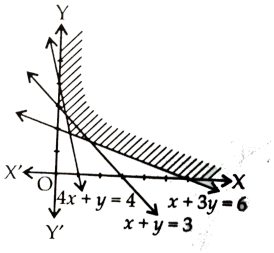
B.



C.



D.



Answer: A

Watch Video Solution

74. The solution set of the inequation $2x + y > 5$ is

A. half plane that contains the origin

B. open half plane not containing the origin

C. whole XY-plane except the points lying on line $2x + y = 5$

D. half plane not containing the origin

Answer: B

Watch Video Solution

75. The solution set of the inequation $x + 2y \geq 3$ is

A. half plane containing the origin

B. half plane not containing the origin

C. the whole XY-plane except point lying on line $x + 2y - 3 = 0$

D. open half plane not containing the origin

Answer: B

Watch Video Solution

76. The solution set of $3x + 2y \leq 6$ is

A. half plane not containing origin

B. half plane containing the points lying on line $3x + 2y = 6$ and origin

C. XY-plane except points on line $3x + 2y = 6$

D. half plane not containing the points lying on line $3x + 2y = 6$ and origin

Answer: B

Watch Video Solution

77. The solution set of the inequations $x \leq 4, x - y \geq 0, 3x + y \geq 0$

A. lies in first and second quadrants

B. lies in second and third quadrants

C. lies in third and fourth quadrants

D. lies in fourth and first quadrants

Answer: D

Watch Video Solution

78. The lines $5x + 4y \geq 20, x \leq 6, y \leq 4, x \geq 0, y \geq 0$ form

A. a square

B. a rhombus

C. a triangle

D. a quadrilateral

Answer: D

Watch Video Solution

79. The common region represented by inequalities $y \leq 2, x + y \leq 3, -2x + y \leq 1, x \geq 0, y \geq 0$ is

A. a triangle

B. a quadrilateral

C. a square

D. a pentagon

Answer: D

Watch Video Solution

80. The common region represented by inequalities $0 \leq x \leq 6, 0 \leq y \leq 4$ is

A. a triangle

B. a rectangle

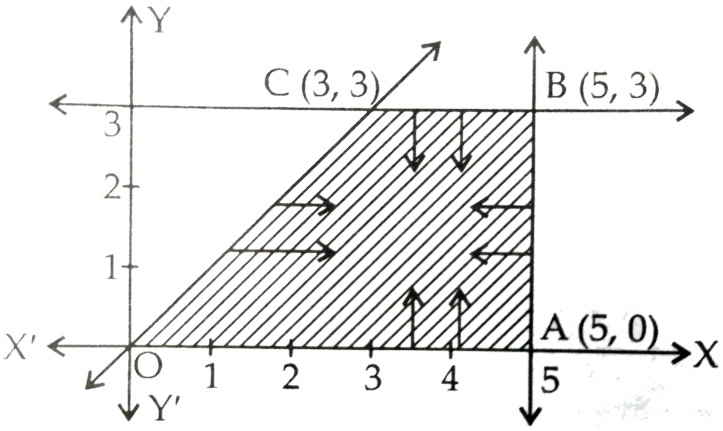
C. a square

D. a pentagon

Answer: B

Watch Video Solution

81. The shaded part of the given figure indicates the feasible region



Then the constraints are

A. $x, y \geq 0, x + y \geq 0, x \geq 5, y \leq 3$

B. $x, y \geq 0, x - y \geq 0, x \leq 5, y \leq 3$

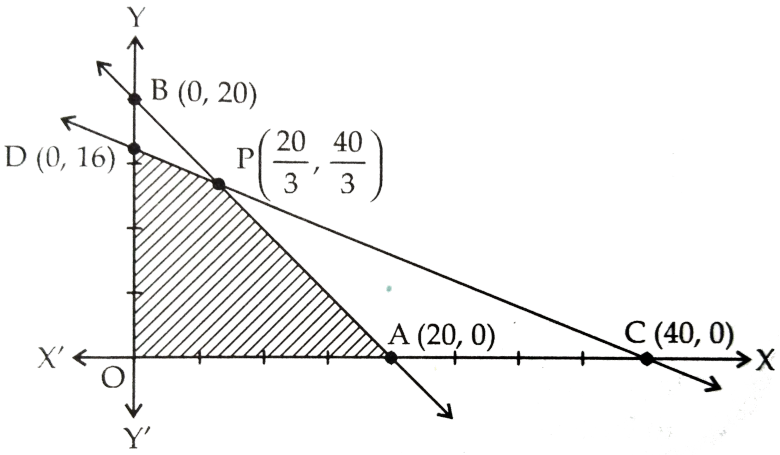
C. $x, y \geq 0, x - y \geq 0, x \leq 5, y \geq 3$

D. $x, y \geq 0, x - y \leq 0, x \leq 5, y \leq 3$

Answer: B

Watch Video Solution

82. Feasible region is represented by



A. $2x + 5y \geq 80, x + y \leq 20, x \geq 0, y \geq 0$

B. $2x + 5y \leq 80, x + y \geq 20, x \geq 0, y \geq 0$

C. $2x + 5y \geq 80, x + y \geq 20, x \geq 0, y \geq 0$

D. $2x + 5y \leq 80, x + y \leq 20, x \geq 0, y \geq 0$

Answer: D

Watch Video Solution

83. The vertex of the linear inequalities $2x + 3y \leq 6, x + 4y \leq 4, x \geq 0, y \geq 0$ is

A. (1,0)

B. (1,1)

C. $\frac{12}{5}, \frac{2}{5}$

D. $\frac{2}{5}, \frac{12}{5}$

Answer: C

Watch Video Solution

84. The solution set of the constraints $x + y \leq 11, 3x + 2y \geq 25, 2x + 5y \geq 20, x \geq 0, y \geq 0$ includes the point

A. (2,3,)

B. (3,2)

C. (3,8)

D. (4,3)

Answer: C

Watch Video Solution

85. The corner points of common region are, if $2x + y \geq 9, x + 2y \geq 9, x + y \geq 7$ and $x \geq 0, y \geq 0,$

A. (9,0),(2,5),(0,9)

B. (9,0),(2,5),(2,5)

C. (9,0),(2,5),(0,9)

D. (9,0),(5,2),(2,5),(0,9)

Answer: D

Watch Video Solution

86. A company manufactures two types of chemicals A and B. Each chemical requires the types of raw materials P and Q. The table below shows number of units of P and Q required to manufacture one unit of A and one unit of B and the total availability of P and Q.

Raw material ↓ \ Chemical →	A	B	Availability
P	3	2	120
Q	2	5	160

The company gets profit of Rs. 350 and RS.400 by selling one unit of A and one unit of B respectively. If the entire production of A and B is sold, then formulate the problem as LPP.

A. Maximize $z = 350x + 400y$ subject to

$3x + 2y \geq 120, 2x + 5y \leq 160, x \geq 0, y \geq 0$

B. Maximize $z = 350x + 400y$ subject to

$3x + 2y \leq 120, 2x + 5y \geq 160, x \geq 0, y \geq 0$

C. Maximize $z = 350x + 400y$ subject to

$3x + 2y \leq 120, 2x + 5y \leq 160, x \geq 0, y \geq 0$

D. Maximize $z = 350x + 400y$ subject to

$3x + 2y \geq 120, 2x + 5 \geq 160, x \geq 0, y \geq 0$

Answer: C

Watch Video Solution

87. A furniture manufacturer produces tables and bookshelves made up of wood and steel. The weekly reuqirement of wood and steel is given as below.

Material → / Product ↓	Wood	Steel
Table	8	2
Book shelf	11	3

The weekly availability of wood and steel is 450 and 100 units respectively. Profit on a table is Rs.1000 and that on a book shelf is Rs. 1200. To

determine the number of tables and book shelves to be produced every week in order to maximize the total profit, formulate the problem as L.P.P.

A. Maximize $z = 1000x + 1200y$ subject to

$8x + 11y \leq 450, 2x + 3y \leq 100, x \geq 0, y \geq 0$

B. Maximize $z = 1000x + 1200y$ subject to

$8x + 11y \geq 450, 2x + 3y \geq 100, x \geq 0, y \geq 0$

C. Maximize $z = 1000x + 1200y$ subject to

$8x + 11y \geq 450, 2x + 3y \leq 100, x \geq 0, y \geq 0$

D. Maximize $z = 1000x + 1200y$ subject to

$8x + 11y \leq 450, 2x + 3y \geq 100, x \geq 0, y \geq 0$

Answer: A

Watch Video Solution

88. Diet of a sick person must contains at least 4000 units of vitamins, 50 units of minerals and 2500 calories. Two foods F_1 and F_2 cost Rs. 50 and

Rs. 75 per unit respectively. Each unit of food F_1 contains 200 units of vitamins, 2 units of minerals and 40 calories, F_(2)` contains 100 units of vitamins, 3 units of minerals and 35 calories. Formulate the above problem as LPP to fulfil sick person's requirements at minimum cos.

A. Maximized $z = 50x = 75y$ subject to

$200x + 100y \geq 4000, 2x + 3y \geq 50, 40x + 35y \leq 2500, x \geq 0, y \geq 0$

B. Maximized $z = 50x = 75y$ subject to

$200x + 100y \leq 4000, 2x + 3y \geq 50, 40x + 35y \geq 2500, x \geq 0, y \geq 0$

C. Maximized $z = 50x = 75y$ subject to

$200x + 100y \geq 4000, 2x + 3y \leq 50, 40x + 35y \geq 2500, x \geq 0, y \geq 0$

D. Maximized $z = 50x = 75y$ subject to

$200x + 100y \geq 4000, 2x + 3y \geq 50, 40x + 35y \geq 2500, x \geq 0, y \geq 0$

Answer: D

Watch Video Solution

89. A printing company prints two types of magzines A and B. The company earns Rs. 20 and Rs. 30 on each copy of magazines A and B respectively. The magazine A requires 2 hours on machine I, 4 hours on Machine II and 2 hours machine III. Magazine B requires 3 hours on machine I, 5 hours on machine II and 3 hours on machine III. Machines I,II, III are available for 35, 50 and 70 hours per week respectively. Formulate the LPP to determine weekly production of magazines A and B, so that the total profit is maximum

A. Maximize $z = 20x + 3y$ subject to

$2x + 3y \leq 35, 4x + 5y \leq 50, 2x + 3y \geq 70, x \geq 0, y \geq 0$

B. Maximize $z = 20x + 3y$ subject to

$2x + 3y \leq 35, 4x + 5y \leq 50, 2x + 3y \leq 70, x \geq 0, y \geq 0$

C. Maximize $z = 20x + 3y$ subject to

$2x + 3y \leq 35, 4x + 5y \geq 50, 2x + 3y \leq 70, x \geq 0, y \geq 0$

D. Maximize $z = 20x + 3y$ subject to

$2x + 3y \geq 35, 4x + 5y \leq 50, 2x + 3y \leq 70, x \geq 0, y \geq 0$

Answer: B

Watch Video Solution

90. A dealer wishes to purchase table fans and ceiling fans. He has Rs. 57,600 to invest, and has space to store 40 items. A table fan costs Rs. 750 and ceiling fan costs Rs. 900. He can make profits of Rs. 70 and Rs. 90 by selling a table fan and a ceiling fan respectively. If dealer sell all the fans that he buy, the formulate this problem as LPP, to maximize the profit.

A. Maximize $z = 70x + 90y$ subject to

$750x + 900y \leq 57600, x + y \leq 40, x \geq 0, y \geq 0$

B. Maximize $z = 70x + 90y$ subject to

$750x + 900y \geq 57600, x + y \leq 40, x \geq 0, y \geq 0$

C. Maximize $z = 70x + 90y$ subject to

$750x + 900y \leq 57600, x + y \geq 40, x \geq 0, y \geq 0$

D. Maximize $z = 70x + 90y$ subject to

$$750x + 900y \geq 57600, x + y \geq 40, x \geq 0, y \geq 0$$

Answer: A

Watch Video Solution

91. Shalmali wanto to invest Rs. 50,000 in saving certificates and PPF. She went to invest at least Rs. 15,000 in saving certificates and at least Rs. 20,000 in PPF. The rate of interest on saving certificates is 8% p.a. and on PPF is 9% p.a. Formulate the LPP for maximun yearly income.

A. Maximize $z = 0.08x + 0.09y$ subject to

$$x + y \leq 50000, x \leq 15000, y \geq 20000, x \geq 0, y \geq 0$$

B. Maximize $z = 0.08x + 0.09y$ subject to

$$x + y \leq 50000, x \geq 15000, y \leq 20000, x \geq 0, y \geq 0$$

C. Maximize $z = 0.08x + 0.09y$ subject to

$$x + y \leq 50000, x \geq 15000, y \geq 20000, x \geq 0, y \geq 0$$

D. Maximize $z = 0.08x + 0.09y$ subject to

$$x + y \leq 50000, x \leq 15000, y \leq 20000, x \geq 0, y \geq 0$$

Answer: C

Watch Video Solution

92. If a motorcyclist rides at a speed of 50 km/hr, he has to spend Rs. 2 per km on petrol. If he rides at a faster speed of 70 km/hr, the petrol cost increases to Rs. 2.5 per km. He has Rs. 500 To spend on petrol and wishes to travel maximum distance within an hour. Formulate as LPP.

A. Maximize $z = x + y$ subject to

$$\frac{x}{50} + \frac{y}{70} \leq 1, 2x + 2.5y \geq 500, x \geq 0, y \geq 0$$

B. Maximize $z = x + y$ subject to

$$\frac{x}{50} + \frac{y}{70} \leq 1, 2x + 2.5y \leq 500, x \geq 0, y \geq 0$$

C. Maximize $z = x + y$ subject to

$$\frac{x}{50} + \frac{y}{70} \geq 1, 2x + 2.5y \leq 500, x \geq 0, y \geq 0$$

D. Maximize $z = x + y$ subject to

$$\frac{x}{50} + \frac{y}{70} \geq 1, 2x + 2.5y \geq 500, x \geq 0, y \geq 0$$

Answer: B

Watch Video Solution

93. Two different kinds of foods A and B are being considered to form a weekly diet. The minimum weekly requirment of fats, carbohydrates and proteins are 17,28 and 14 units respectively. One kg of food A has 5 units of fat, 12 units of carbohydrates and 7 units of protein. One kg of food B has 7 units of fat, 15 units of carbohydrates and 9 units of protein. The price of food A is Rs. 5 per kg. and that of food B is Rs. 7 per kg. Form the LPP to minimize the cost.

A. Minimize $z = 5x + 7y$ subject to

$$5x + 7y \leq 17, 12x + 15y \geq 28, 7x + 9y \geq 14, x \geq 0, y \geq 0$$

B. Minimize $z = 5x + 7y$ subject to

$$5x + 7y \geq 17, 12x + 15y \leq 28, 7x + 9y \geq 14, x \geq 0, y \geq 0$$

C. Minimize $z = 5x + 7y$ subject to

$$5x + 7y \geq 17, 12x + 15y \geq 28, 7x + 9y \leq 14, x \geq 0, y \geq 0$$

D. Minimize $z = 5x + 7y$ subject to

$$5x + 7y \geq 17, 12x + 15y \geq 28, 7x + 9y \geq 14, x \geq 0, y \geq 0$$

Answer: D

Watch Video Solution

94. A shop keeper sells to two items, colour T.V. sets and DVD players. He can invest Rs. 12,00,000 and can store only 750 items. The cost of color TV and DVD player is Rs. 6500 and Rs. 2800 respectively. He can sell these items at a price of Rs. 8600 and Rs. 3900 respectively. Form the LPP to maximize the profit.

A. Maximize $z = 2100x + 1100y$ subject to

$6500x + 2800y \leq 1200000, x + y \geq 750, x \geq 0, y \geq 0$

B. Maximize $z = 2100x + 1100y$ subject to

$6500x + 2800y \leq 1200000, x + y \leq 750, x \geq 0, y \geq 0$

C. Maximize $z = 2100x + 1100y$ subject to

$6500x + 2800y \geq 1200000, x + y \leq 750, x \geq 0, y \geq 0$

D. Maximize $z = 2100x + 1100y$ subject to

$6500x + 2800y \geq 1200000, x + y \geq 750, x \geq 0, y \geq 0$

Answer: B

Watch Video Solution

95. A factory makes two types of biscuit B_1 and B_2 that cost Rs. 145 and Rs. 160 per kg. respectively. The minimum quantities of flour, sugar and butter to be ordered for the for the factory are 600kg, 400 kg and 250 kg respectively to make the biscuits. Variety B_1 requires 700 gms of flour,

200 gms of sugar and 100 gms. of butter to prepare 1 kg of biscuits. The variety B_2 requires 600 gms of flour, 300 gms of sugar and 200 gms of butter to prepare 1 kg of biscuits. Formulate the above LPP to minimize the cost.

A. Minimize $z = 145x + 160y$ subject to

$0.7x + 0.6y \geq 600, 0.2x + 0.3y \geq 400, 0.1x + 0.2y \geq 250, x \geq 0, y \geq$

B. Minimize $z = 145x + 160y$ subject to

$0.7x + 0.6y \geq 600, 0.2x + 0.3y \geq 400, 0.1x + 0.2y \leq 250, x \geq 0, y \geq$

C. Minimize $z = 145x + 160y$ subject to

$0.7x + 0.6y \geq 600, 0.2x + 0.3y \leq 400, 0.1x + 0.2y \geq 250, x \geq 0, y \geq$

D. Minimize $z = 145x + 160y$ subject to

$0.7x + 0.6y \leq 600, 0.2x + 0.3y \geq 400, 0.1x + 0.2y \geq 250, x \geq 0, y \geq$

Answer: A

Watch Video Solution

96. An aeroplane can carry a maximum of 250 passengers. A profit of Rs. 1500 is made on each executive class ticket and a profit of Rs. 900 made on each economy class ticket. the airline reserves at least 30 seats ofr executive class. However at least 4 times as many passengers perfer to travel by economomy class than by excutive class. Formulate LPP in order to maximize the profit for the airline.

A. Minimize $z = 1500x + 900y$ subject to

$x + y \leq 250, x \leq 30, y \geq 4x, x \geq 0, y \geq 0$

B. Minimize $z = 1500x + 900y$ subject to

$x + y \leq 250, x \geq 30, y \geq 4x, x \geq 0, y \geq 0$

C. Minimize $z = 1500x + 900y$ subject to

$x + y \geq 250, x \geq 30, y \geq 4x, x \geq 0, y \geq 0$

D. Minimize $z = 1500x + 900y$ subject to

$x + y \geq 250, x \geq 30, y \geq 4x, x \geq 0, y \geq 0$

Answer: B

Watch Video Solution

97. Two tailors P and Q earn Rs. 350 and Rs. 450 per day respectively. Tailor P can stitch 6 shirts and 3 trousers while tailor Q can stitch 7 shirts and 3 trousers per day. Formulate the LPP, if it is desired to produce at least 51 shrits and 24 trousers at a minimum labour cost?

A. Minimize $z = 350x + 450y$ subject to

$6x + 7y \leq 51, 3x + 3y \geq 24, x \geq 0, y \geq 0$

B. Minimize $z = 350x + 450y$ subject to

$6x + 7y \geq 51, 3x + 3y \leq 24, x \geq 0, y \geq 0$

C. Minimize $z = 350x + 450y$ subject to

$6x + 7y \geq 51, 3x + 3y \geq 24, x \geq 0, y \geq 0$

D. Minimize $z = 350x + 450y$ subject to

$6x + 7y \leq 51, 3x + 3y \leq 24, x \geq 0, y \geq 0$

Answer: C

Watch Video Solution

Watch Video Solution

98. A diet of sick person contains at least 48 units of vitamin A and 64 uints of vitamin B. Two foods F_1 and F_2 are available . Food F_1 costs Rs. 6 per unit and food F_2 costs Rs. 10 per unit. One unit of food F_1 contains 6 units of vitamin A and 7 units of vitamin B. One unit of of food F_2 contain 8 units of vitamin A and 12 units of vitamin B. Formulate the LPP, for the minimum cost for the diet that consists of mixture of these two foods and also meeting the minimal nutrition requirements

A. Minimize $z = 6x + 10y$ subject to

$6x + 8y \leq 48, 7x + 12y \geq 64, x \geq 0, y \geq 0$

B. Minimize $z = 6x + 10y$ subject to

$6x + 8y \geq 48, 7x + 12y \leq 64, x \geq 0, y \geq 0$

C. Minimize $z = 6x + 10y$ subject to

$6x + 8y \geq 48, 7x + 12y \geq 64, x \geq 0, y \geq 0$

D. Minimize $z = 6x + 10y$ subject to

$6x + 8y \leq 48, 7x + 12y \leq 64, x \geq 0, y \geq 0$

Answer: C

Watch Video Solution

99. The construction company uses concrete blocks made up of cement and sand. The weight of a concrete block has to be at least 5kg. Cement costs Rs. 20 per kg. while sand costs Rs. 6 per kg. Strength consideration dictate that the concrete block should contain minimum 4 kg. of cement and not more than 2 kg. of sand. Form the LPP for the cost to be minimum.

A. Maximize $z = 20x + 6y$ subject to

$x + y \geq 5, x \leq 4, y \leq 2, x \geq 0, y \geq 0$

B. Maximize $z = 20x + 6y$ subject to

$x + y \geq 5, x \leq 4, y \geq 2, x \geq 0, y \geq 0$

C. Maximize $z = 20x + 6y$ subject to

$x + y \geq 5, x \geq 4, y \geq 2, x \geq 0, y \geq 0$

D. Maximize $z = 20x + 6y$ subject to

$x + y \geq 5, x \geq 4, y \leq 2, x \geq 0, y \geq 0$

Answer: D

Watch Video Solution

100. An owner of a lodge plans a extension which contains not more than 50 rooms. At least 5 must be executive single rooms. The number of executive double rooms should be at least 3 times the number of executive single rooms. He charges Rs. 1800 for executive single rooms per day and Rs.3000 for executive double room. Formulate the above problem as LPP to maximize the profit.

A. Maximize $z = 1800x + 3000y$ subject to

$x + y \leq 50, x \geq 5, y \leq 3x, x \geq 0, y \geq 0$

B. Maximize $z = 1800x + 3000y$ subject to

$x + y \leq 50, x \leq 5, y \geq 3x, x \geq 0, y \geq 0$

C. Maximize $z = 1800x + 3000y$ subject to

$x + y \leq 50, x \geq 5, y \geq 3x, x \geq 0, y \geq 0$

D. Maximize $z = 1800x + 3000y$ subject to

$x + y \leq 50, x \leq 5, y \leq 3x, x \geq 0, y \geq 0$

Answer: A

Watch Video Solution

101. The objective function off LPP defined over the convex set attains it optimum value at

A. at least two of the corner points

B. all the corner points

C. at least one of the corner points

D. none of the corner points

Answer: C

Watch Video Solution