MATHS

BOOKS - MODERN PUBLICATION MATHS (KANNADA ENGLISH)

THREE DIMENSIONAL GEOMETRY

Level I Mcqs

1. P is a point on the line segment joining the points (3, 2, – 1) and (6, 2, - 2). If x co-ordinate

of P is 5, then its y co-ordinate is :

A. 2

B. 1

C. -1

D. -2

Answer: A

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2. A line makes equal angles with coordinate axes. Direction cosines of this line are :

A. $\pm < 1, 1, 1 >$

B. $\pm < \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}} >$

C. $\pm < \frac{1}{3}, \frac{1}{3}, \frac{1}{3}, >$

D. $\pm < \frac{1}{\sqrt{3}}, -\frac{1}{\sqrt{3}}, \frac{-1}{\sqrt{3}} >$

Answer: B

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3. The sine of the angle between the straight line $\frac{x-2}{3} = \frac{3-y}{-4} = \frac{z-4}{5}$ and the plane $2x - 2y + z = 5$ is

A. $\frac{10}{6\sqrt{5}}$

B. $\frac{4}{5\sqrt{2}}$

C. $\frac{2\sqrt{3}}{5}$

D. $\frac{\sqrt{2}}{10}$

Answer: D

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4. Reflection of the point (α, β, γ) in XY plane is

A. $(\alpha, \beta, 0)$

B. $(0, 0, \gamma)$

C. $(-\alpha, -\beta, \gamma)$

D. $(\alpha, \beta, -\gamma)$

Answer: D

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5. The area of the quadrilateral ABCD, where A (0, 4, 1), B (2, 3, - 1), C(4, 5, 6) and D (2, 6, 2) is equal to :

A. 9 sq. units

B. 18 sq. units

C. 27 sq. units

D. 81 sq. units

Answer: A

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6. The ratio in which the plane $\vec{r}.(i-2j+3k)=17$ divides the line joining the points -2i+4j+7k and 3i-5j+8k is

A. $1:5$

B. $1:10$

C. $3:5$

D. $3:10$

Answer: D

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7. The length of the projection of the segment joining (x_1, y_1, z_1) and (x_2, y_2, z_2) on the line :

$$\frac{x-\alpha}{l} = \frac{\gamma-\beta}{m} = \frac{z-y}{n}$$ is :

A.

$$|l(x_2 - x_1) + m(y_2 - y_1) + n(z_2 - z_1)|$$

B.

$$|\alpha(x_2 - x_1) + \beta(y_2 - y_1) + \gamma(z_2 - z_1)|$$

C. $$\left|\frac{x_2 - x_1}{l} + \frac{y_2 - y_1}{m} + \frac{z_2 - z_1}{n}\right|$$

D. None of these

Answer: A

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

A. perpendicular

B. intersecting

C. skew

D. parallel

Answer: B

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9. The points (5,-4,2),(4,-3,1),(7,-6,4),(8,-7,5) are vertices of a:

A. Rhombus

B. Square

C. Parallelogram

D. Rectangle

Answer: C

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10. Algebraic sum of the intercepts made by the plane x+3y-4z + 6 = 0 on the axes is:

A. $-\frac{13}{2}$

B. $\frac{19}{2}$

C. $-\frac{22}{3}$

D. $\frac{26}{2}$

Answer: A

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11. The lines whose vector equations are:

$\vec{r} = \vec{a} + t\vec{b}, \vec{r} = \vec{c} + t'\vec{d}$ are coplanar

if :

A. $\left(\vec{a} - \vec{b}\right).\left(\vec{c} \times \vec{d}\right) = 0$

B. $\left(\vec{a} - \vec{c}\right).\left(\vec{b} \times \vec{d}\right) = 0$

C. $\left(\vec{b} - \vec{c}\right).\left(\vec{a} \times \vec{d}\right) = 0$

D. $\left(\vec{b} - \vec{d}\right).\left(\vec{a} \times \vec{d}\right) = 0$

Answer: B

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12. The point, which divides the line joining the points (2, 4, 5) and (3, 5, -4) in the ratio - 2:3, lies on:

A. XOY plane

B. YOZ plane

C. ZOX plane

D. None of these

Answer: B

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13. The ratio in which the line joining points (2, 4, 5), (3,5,- 4) is divided by yz-plane is :

A. $4:3$

B. $-2:3$

C. $3:2$

D. $2:3$

Answer: B

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14. Volume of a tetrahedron is k area of one face) (length of perpendicular from the opposite vertex upon it). where k is :

A. $\frac{1}{4}$

B. $\frac{1}{3}$

C. $\frac{1}{6}$

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

Answer: B

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15. The angle between pair of lines whose direction-ratios are < 1, 1, 2 > and < 3-1,-$\sqrt{3}$-1,4 > is:

A. 30°

B. 45°

C. 60°

D. 90°

Answer: C

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16. If a line makes angle α, β, γ with the axes respectively, then $\cos 2\alpha + \cos 2\beta + \cos 2\gamma$ =

A. -2

B. -1

C. 1

D. 2

Answer: B

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17. The direction-cosines of the normal to the plane :

x+2y - 3z + 4 = 0 are :

A. $< \frac{1}{\sqrt{14}}, \frac{-2}{\sqrt{14}}, \frac{3}{\sqrt{14}} >$

B. $< \frac{1}{\sqrt{14}}, \frac{2}{\sqrt{14}}, \frac{3}{\sqrt{14}} >$

C. $< \frac{-1}{\sqrt{14}}, \frac{2}{\sqrt{14}}, \frac{3}{\sqrt{14}} >$

D. $< \frac{1}{\sqrt{14}}, \frac{2}{\sqrt{14}}, \frac{-3}{\sqrt{14}} >$

Answer: D

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18. What is the distance of the point (2,3,4) from the plane $3x - 6y + 2z + 11 = ?$

A. 9

B. 10

C. 2

D. 1

Answer: D

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19. The angle between the two planes 3x- 4y + 5z = 0 and 2x-y - 2z = 5 is :

A. $\pi/2$

B. $\pi/3$

C. $\pi/4$

D. 0

Answer: A

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20. The angle between the planes: 3x - 4y + 5z = 0 and 2x-y-2z = 5 is:

A. $\pi / 4$

B. $\pi / 2$

C. $\pi / 3$

D. None of these

Answer: B

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21. The plane passing through the point (a, b, c) and parallel to the plane $x + y + z = 0$ is:

A. $ax + by + cz = 0$

B. $x+y+z+a+b+c=0$

C. $x + y+z = a + b + c$

D. None of these

Answer: C

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22. A plane meets the coordinate axes at A, B, C such that the centroid of the triangle is (3, 3, 3). The equation of the plane is :

A. $9x+9y+9z=1$

B. $x+y+z=3$

C. $3x+3y+3z=1$

D. $x+y+z=9$

Answer: D

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23. The plane x- 2y +z-6 = 0 and the line $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ are related as:

A. lies in the plane

B. at right, angles to plane

C. parallel to plane

D. meets the plane obliquely,

Answer: C

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24. The line $\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-4}{5}$ is parallel to the plane

A. 2x+y-2z=0

B. x+y+z=0

C. 3x+4y+5z=7

D. 2x+3y+4z=0

Answer: A

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25. A plane meets the coordinate axes in A, B, C and (α, β, γ) is the centroid of the triangle ABC. then the equation of the plane is :

A. $\alpha x + \beta y + \gamma z = 1$

B. $\frac{x}{\alpha} + \frac{y}{\beta} + \frac{z}{\gamma} = 1$

C. $\frac{x}{\alpha} + \frac{y}{\beta} + \frac{z}{\gamma} = 3$

D. $\frac{3x}{\alpha} + \frac{3y}{\beta} + \frac{3z}{\gamma} = 1$

Answer: C

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26. The distance between the parallel planes:

ax + by + cz + d = 0 and ax + by+ cz + d' =0 is :

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

B. $\frac{|d+d'|}{\sqrt{a^2+b^2+c^2}}$

C. $\frac{|d-d'|}{\sqrt{a^2+b^2+c^2}}$

D. None of these

Answer: C

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27. In three dimensional space, the equation 3y + 4z = 0 represents :

A. a plane containing z-axis

B. a plane containing x-axis

C. a plane containing y-axis

D. a line with direction numbers lt 0,3,4 gt

Answer: B

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28. The projection of segment [PQ] on the co-ordinate planes are-9, 12, -8 respectively. The direction-cosines of PQ are :

A. $< \frac{-9}{17}, \frac{12}{17}, \frac{-8}{17} >$

B. $< \frac{-9}{289}, \frac{12}{289}, \frac{-8}{289} >$

C. $< \frac{-9}{\sqrt{17}}, \frac{12}{\sqrt{17}}, \frac{-8}{\sqrt{17}} >$

D. $< -9, 12, -8 >$

Answer: A

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29. If the planes x + 2y + kz = 0 and 2x+y - 2z = 0 are at rt. angles, then the value of k is:

A. $-1/2$

B. $1/2$

C. -2

D. 2

Answer: D

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30. The angle between two 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

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31. The equations of the line through the point (1, 2, 3) and parallel to the line $\frac{x-4}{2}=\frac{y+1}{-3}=\frac{z+10}{6}$ are :

A. $\frac{x-4}{1}=\frac{y+1}{2}=\frac{z+10}{3}$

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

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

D. None of these

Answer: B

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32. The equation of the line joining the and (-2,4,2) and (7,-2,5) are :

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

B. $\frac{x}{7} = \frac{y}{-2} = \frac{z}{5}$

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

D. None of these

Answer: A

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33. The lines $\frac{x-1}{1}=\frac{y-2}{2}=\frac{z-3}{3}$ and $\frac{x}{2}=\frac{y+2}{2}=\frac{z-3}{-2}$ are :

A. at. rt. angles

B. skew

C. parallel

D. intersecting

Answer: A

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34. Lines $\vec{r} = \vec{a}_1 + t\vec{b}_1$ and $\vec{r} = \vec{a}_2 + s\vec{b}_2$ are parallel iff:

A. $\vec{b}_1 = \lambda\vec{b}_2$ for some real λ

B. $\vec{b}_2$ is parallel to $\vec{a}_2 - \vec{a}_1$

C. $\vec{b}_1$ is parallel to $\vec{a}_2 - \vec{a}_1$

D. None of these

Answer: A

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35. Skew lines are :

A. non-coplanar lines

B. coplanar lines

C. perpendicular lines

D. parallel lines.

Answer: A

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36. The projections of a line segment on x,y,z axes are 12, 4, 3. The length and the direction-cosines of the line segment are :

A. $11, < \frac{12}{11}, \frac{14}{11}, \frac{3}{11} >$

B. $19, < \frac{12}{19}, \frac{4}{19}, \frac{3}{19} >$

C. $13, < \frac{12}{13}, \frac{4}{13}, \frac{3}{13} >$

D. None of these

Answer: C

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37. Given the line $L = \frac{x-1}{3} = \frac{y+1}{2} = \frac{z-3}{-1}$ and the plane $\pi : x - 2y - z = 0$, of the following assertions, the only one that is always true is:

A. L is parallel to π

B. L is perpendicular to π

C. L lies in π

D. None of these.

Answer: C

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38. Equation of the line passing through (1, 1,1) and perpendicular to 2x + 3y + z = 5 is:

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

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

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

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

Answer: D

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39. Three lines drawn from origin with direction cosines $l_1, m_1, n_1, l_2, m_2, n_2, l_3, m_3, n_3$ are coplanar iff : $\begin{vmatrix} l_1 & m_1 & n_1 \\ l_2 & m_2 & n_2 \\ l_3 & m_3 & n_3 \end{vmatrix}$ =0 since :

A. intersecting lines are coplanar

B. it is possible to find a line perpendicular to all these lines

C. all lines pass through origin

D. None of these.

Answer: A

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40. The plane $ax + by + cz = 1$ meets the coordinate axes in A, B, C. The centroid of the triangle is :

A. (3a,3b,3c)

B. $\left(\frac{a}{3}, \frac{b}{3}, \frac{c}{3}\right)$

C. $\left(\frac{3}{a}, \frac{3}{b}, \frac{3}{c}\right)$

D. $\left(\frac{1}{3a}, \frac{1}{3b}, \frac{1}{3c}\right)$

Answer: D

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41. The equation of the plane containing the line $\frac{x - x_1}{l} = \frac{y - y_1}{m} = \frac{z - z_1}{n}$ is :

$a(x - x_1) + b(y - y_1) + c(z - z_1) = 0$,

where :

A. $ax_1 + by_1 + cz_1 = 0$

B. al+bm+cn=0

C. $\frac{a}{l} = \frac{b}{m} = \frac{c}{n}$

D. $lx_1 + my_1 + nz_1 = 0$

Answer: B

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42. The two lines : $x+ay+b, z=cy+d$, and $x=a'y+b'$, $z=c'y+d'$ will be perpendicular if and only if:

A. $aa'+bb'+cc'=0$

B. $(a+a')(b+b')+(c+c')=0$

C. $aa'+cc'+1=0$

D. $aa'+bb'+cc'+1=0$

Answer: C

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43. The line $\frac{x-4}{1}=\frac{y-2}{1}=\frac{z-k}{2}$ lies exactly on the plane 2x-4y+z=7 , then the value of k is :

A. 7

B. -7

C. 1

D. No real value

Answer: A

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44. A line makes some angle θ, with each of the x and z-axis. If the angle β, which it makes with y-axis, is such that $\sin^2\beta = 3\sin^2\theta, the \cos^2\theta$ equals:

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

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

C. $\frac{3}{5}$

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

Answer: D

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45. Distance between two parallel planes: $2x + y + 2z = 8$ and $4x + 2y + 4z + 5 = 0$ is:

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

B. $\frac{5}{2}$

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

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

Answer: C

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46. The angle between the lines $2x = 3y = -z$ and $6x = -y = 04z$ is

A. 90°

B. 0°

C. 30°

D. 45°

Answer: A

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47. The distance between the line : $\vec{r}. = 2\hat{i} - 2\hat{j} + 3\hat{k} + \lambda\left(\hat{i} - \hat{j} - 4\hat{k}\right)$ and the plane $\vec{r}.\left(\hat{i} + 5\hat{j} + \hat{k}\right) = 5$ is :

A. $\frac{10}{3\sqrt{3}}$

B. $\frac{10}{9}$

C. $\frac{10}{3}$

D. $\frac{3}{10}$

Answer: A

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48. The two lines x=ay+b, z=cy+d and x=a'y+b', z=c'y+d' are perpendicular to each other if :

A. aa'+cc'=-1

B. aa'+cc'=1

C. $\frac{a}{a'} + \frac{c}{c'} = -1$

D. $\frac{a}{a'} + \frac{c}{c'} = 1$

Answer: A

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49. A plane passes through (1, - 2, 1) and is perpendicular to the planes 2x - 2y +z = 0 and x-y + 2z = 4. The distance of the plane from the point (1, 2, 2) is:

A. 0

B. 1

C. $\sqrt{2}$

D. $2\sqrt{2}$

Answer: D

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50. Let L be the line of intersection of the planes:

$2x + 3y + z = 1$ and $x + 3y + 2z = 2$.

If L makes an angle α with the positive x-axis, then $\cos \alpha$ equals

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

B. 1

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

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

Answer: D

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51. The direction-ratios of the diagonal of a cube, which joins the origin to the opposite corner are (when the 3 concurrent edges of the cube are coordinate axes):

A. $< \frac{2}{\sqrt{3}}, \frac{2}{\sqrt{3}}, \frac{2}{\sqrt{3}} >$

B. $< 1, 1, 1 >$

C. $< 2, -2, 1 >$

D. $< 1, 2, 3 >$

Answer: B

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52. The angle between two diagonals of a cube is

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

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

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

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

Answer: B

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53. The point equidistant from (a, 0, 0), (0, a, 0), (0, 0, a) and (0, 0, 0) is:

A. $\left(\frac{a}{3}, \frac{a}{3}, \frac{a}{3}\right)$

B. $\left(\frac{a}{2}, \frac{a}{2}, \frac{a}{2}\right)$

C. (a,a,a)

D. (2a,2a,2a)

Answer: B

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54. If a plane meets coordinate axes in A, B, C such that the centroid of the triangle is $(1, k, k^2)$, then equation of the plane is :

A. $x + ky + k^2z = 3k^2$

B. $k^2x + ky + z = 3k^2$

C. $x + ky + k^2z = 3$

D. $k^2x + ky + z = 3$

Answer: B

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55. The points (5, 2, 4), (6,-1, 2) and (8, -7, k) are collinear if k is equal to :

A. 2

B. -1

C. 3

D. -2

Answer: D

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56. The direction ratios of a normal to the plane thro' (1,0,0), (0, 1, 0), which makes an angle of with $\frac{\pi}{4}$ the plane x + y = 3 are :

A. $< 1, \sqrt{2}, 1 >$

B. $< 1, 1, \sqrt{2} >$

C. $< 1, 1, 2 >$

D. $< \sqrt{2}, 1, 1 >$

Answer: B

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57. The plane, which passes through the point (3, 2, 0) and the line $\frac{x-3}{1} = \frac{y-6}{5} = \frac{z-4}{4}$ is :

A. $x- y+z=1$

B. $x + y + z = 5$

C. $x+2y – z = 1$

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

Answer: A

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58. Two systems of rectangular axes have the same origin. If a plane cuts them at distance a, b,c and a',b',c' from the origin, then :

A. $\frac{1}{a^2}+\frac{1}{b^2}+\frac{1}{c^2}+\frac{1}{a'^2}+\frac{1}{b'^2}+\frac{1}{c'^2}=0$

B. $\frac{1}{a^2}-\frac{1}{b^2}-\frac{1}{c^2}+\frac{1}{a'^2}-\frac{1}{b'^2}-\frac{1}{c'^2}=0$

C. $\frac{1}{a^2}+\frac{1}{b^2}+\frac{1}{c^2}-\frac{1}{a'^2}-\frac{1}{b'^2}-\frac{1}{c'^2}=0$

D. $\frac{1}{a^2}+\frac{1}{b^2}+\frac{1}{c^2}+\frac{1}{a'^2}+\frac{1}{b'^2}+\frac{1}{c'^2}=0$

Answer: C

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59. 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 co-planar if :

A. k=1 or -1

B. k=0 or -3

C. k=3 or -3

D. k=0 or -1

Answer: B

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60. A tetrahedron has vertices O (0, 0, 0), A (1, 2, 1), B (2, 1, 3) and C(-1, 1, 2). The angle between the faces OAB and ABC will be:

A. $\cos^{-1}\left(\frac{17}{31}\right)$

B. 30°

C. 90°

D. $\cos^{-1}\left(\frac{19}{35}\right)$

Answer: D

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61. If the straight line, x =1 + s, y = 3-λs, z = 1+ λ s and $x = \frac{t}{2}, y = 1 + t, z = 2 - t,$ with

parameters s and t and respectively, are coplanar, then λ equals:

A. -2

B. -1

C. $-\frac{1}{2}$

D. 0

Answer: A

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62. Lines $\frac{x-1}{2}=\frac{y+1}{3}=\frac{z-1}{4}$ and $\frac{x-3}{1}=\frac{y-k}{1}=\frac{z}{1}$ intersects , then k equals :

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

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

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

D. $\frac{-3}{2}$

Answer: B

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63. If the angle θ between the $\frac{x+1}{1}=\frac{y-1}{2}=\frac{z-2}{2}$ and the plane $2x-y+\sqrt{\lambda}z+4=0$ is such that $\sin\theta=\frac{1}{3}$, the value of λ is :

A. $\frac{-3}{5}$

B. $\frac{5}{3}$

C. $\frac{-4}{3}$

D. $\frac{3}{4}$

Answer: B

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64. A variable plane at a distance of 1 unit from the origin cuts the coordinate axes at A,B and C satisfies the relation $\frac{1}{x^2}+\frac{1}{y^2}+\frac{1}{z^2}=k$, then the value of k is :

A. 3

B. 1

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

D. 9

Answer: D

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65. The image of the point (- 1, 3, 4) in the plane:

x-2y=0 is:

A. $\left(-\frac{17}{3}, -\frac{19}{3}, 4\right)$

B. (15,11,4)

C. $\left(-\frac{17}{3}, -\frac{19}{3}, 1\right)$

D. $\left(\frac{9}{5}, -\frac{13}{5}, 4\right)$

Answer: D

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66. 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 :

A. -2

B. -5

C. 5

D. 2

Answer: B

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67. Let the line $\frac{x-2}{3} = \frac{y-1}{-5} = \frac{z+2}{2}$ lie in the plane $x + 3y - \alpha z + \beta = 0$. Then (α, β) equals :

A. (6,-17)

B. (-6,7)

C. (5,-15)

D. (-5,5)

Answer: B

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68. If a line makes an angle of $\frac{\pi}{4}$ with the positive direction of each of x-axis and y-axis, then the angle that the line makes with the positive direction of the z-axis is :

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

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

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

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

Answer: C

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69. The line passing through the points $(5, 1, a)$ and $(3, b, 1)$ crosses the yz-plane at

the point $\left(0, \frac{17}{2}, \frac{-13}{2}\right)$.Then

A. a=8,b=2

B. a=2,b=8

C. a=4,b=6

D. a=6,b=4

Answer: D

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70. A line with positive direction cosines passes through the point P (2, - 1, 2) and makes equal angles with the coordinate axes. The line meets the plane 2x + y + z = 9 at point Q. The length of the line segment PQ equals:

A. 1

B. $\sqrt{2}$

C. $\sqrt{3}$

D. 2

Answer: C

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Aieee Jee Examination

1. A line AB in three-dimensional space makes angles 45° and 120° with the positive x-axis and the positive y-axis respectively. If AB makes an acute angle θ with the positive z-axis, then θ equals :

A. 30°

B. 45°

C. 60°

D. 75°

Answer: C

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2. Equation of the plane containing the straight line $\frac{x}{2} = \frac{y}{3} = \frac{z}{4}$ and perpendicular to the plane containing the straight lines $\frac{x}{3} = \frac{y}{4} = \frac{z}{2}$ and $\frac{x}{4} = \frac{y}{2} = \frac{z}{3}$ is :

A. $x+2y-2z=0$

B. $3x+2y-2z=0$

C. $x-2y+z=0$

D. $5x+2y-4z=0$

Answer: C

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3. If the distance of the point P (1,-2, 1) from the plane $x + 2y - 2z = \alpha$ where $\alpha > 0$, is 5, then

the foot of the perpendicular from P to the plane is :

A. $\left(\frac{8}{3}, \frac{4}{3}, -\frac{7}{3}\right)$

B. $\left(\frac{4}{3}, -\frac{4}{3}, \frac{1}{3}\right)$

C. $\left(\frac{1}{3}, \frac{2}{3}, \frac{10}{3}\right)$

D. $\left(\frac{2}{3}, -\frac{1}{3}, \frac{5}{2}\right)$

Answer: A

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4. If the angle between the line $x = \frac{y-1}{2} = \frac{z-3}{\lambda}$ and the plane x+2y+3z=4 is $\cos^{-1}\left(\sqrt{\frac{5}{14}}\right)$, then λ equals :

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

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

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

D. $\frac{5}{3}$

Answer: A

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5. The length of the perpendicular drawn from the point $(3, -1, 11)$ to the line $\frac{x}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ is (A) $\sqrt{33}$ (B) $\sqrt{53}$ (C) $\sqrt{66}$ (D) $\sqrt{29}$

A. $\sqrt{29}$

B. $\sqrt{33}$

C. $\sqrt{53}$

D. $\sqrt{65}$

Answer: C

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6. The distance of the point $(1, -5, 9)$ from the plane $x - y + z = 5$ measured along a straighat line $x = y = z$ is (A) $5\sqrt{3}$ (B) $3\sqrt{10}$ (C) $3\sqrt{5}$ (D) $10\sqrt{3}$

A. $10\sqrt{3}$

B. $5\sqrt{3}$

C. $3\sqrt{10}$

D. $3\sqrt{5}$

Answer: A

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7. 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 k is equal to :

A. -1

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

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

D. 0

Answer: C

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8. An equation of a plane parallel to the plane $x - 2y + 2z - 5 = 0$ and at a unit distance from the origin is :

A. $x-2y+2z-3=0$

B. $x-2y+2z+1=0$

C. x-2y+2z-1=0

D. x-2y+2z+5=0

Answer: A

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9. The equation of a plane passing through the line of intersection of the planes: x + 2y + 3z = 2 and x- y + z = 3 at a distance $\frac{2}{\sqrt{3}}$ from the point (3,1,-1) is :

A. $5x - 11y + z = 17$

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

C. x+y+z=$\sqrt{3}$

D. $x - \sqrt{2}y = 1 - \sqrt{2}$

Answer: A

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10. The point P is the intersection of the straight line joining the points Q (2, 3, 5) and R (1, - 1, 4) with the plane 5x - 4y - z = 1. If S is the

foot of the perpendicular drawn from the point T (2, 1, 4) to QR, then the length of the line segment PS is:

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

B. $\sqrt{2}$

C. 2

D. $2\sqrt{2}$

Answer: D

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11. 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. exactly one value

B. exactly two values

C. exactly three values

D. any value.

Answer: B

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12. Distance between two parallel planes: $2x + y + 2z = 8$ and $4x + 2y + 4z + 5 = 0$ is:

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

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

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

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

Answer: B

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13. The image of the line $\frac{x-1}{3}=\frac{y-3}{1}=\frac{z-4}{-5}$ in the plane : 2x-y+z+3=0 is the line :

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

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

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

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

Answer: D

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14. The angle between the lines whose direction cosines satisfy the equations l+ m +n =0 and $l^2 = m^2 + n^2$ is:

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

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

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

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

Answer: D

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15. The distance of the point (1, 0, 2) from the point of intersection of the line $\frac{x-2}{3}=\frac{y+1}{4}=\frac{z-2}{12}$ and the plane x-y+z=16, is :

A. $2\sqrt{14}$

B. 8

C. $3\sqrt{21}$

D. 13

Answer: D

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16. The equation of the plane containing the line:

$2x - 5y + z = 3$, $x + y + 4z = 5$ and parallel to the plane $x + 3y + 6z = 1$, is :

A. $2x + 6y + 12z = 13$

B. $x + 3y + 6z = -7$

C. $x + 3y + 6z = 7$

D. $2x + y - 12z = -13$.

Answer: C

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1. The distance of the point P(a, b, c) from the x-axis is

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

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

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

D. a

Answer: A

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2. Equation of the plane perpendicular to the line $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ and passing through the point (2, 3, 4) is

A. x + 2y + 3z = 9

B. x + 2y + 3z = 20

C. $2x+3y+z=17$

D. $3x+2y+z=16$

Answer: B

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3. The line $\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-4}{5}$ is parallel to the plane

A. $3x+4y+5z=7$

B. $x+y+z=2$

C. $2x+3y+4z=0$

D. $2x+y-2z=0$

Answer: D

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4. The angle between two diagonals of a cube is

A. 30°

B. 45°

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

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

Answer: C

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5. 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=0

B. K=-1

C. K=2

D. K=3

Answer: A

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6. Equation of line passing through the point (2,3,1) and parallel to the line of intersection of the plane $x - 2y - z + 5 = 0$ and $x + y + 3z = 6$ is

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

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

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

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

Answer: B

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7. Foot of perpendicular drawn from the origin to the plane $2x - 3y + 4z = 29$ is _____

A. (5,-1,4)

B. (2,-3,4)

C. (7,-1,3)

D. (5,-2,3)

Answer: B

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8. The direction-ratios of the line, which is perpendicular to the lines:

$\frac{x-7}{2}=\frac{y+17}{-3}=\frac{z-6}{1}$ and $\frac{x+5}{1}=\frac{y+3}{2}=\frac{z-4}{-2}$ are :

A. $<$ 4 , 5, 7 gt

B. $<$ 4, -5 , 7 gt

C. $<4,\ -5,\ -7>$

D. $<\ -4, 5, 7>$

Answer: A

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9. A line making angles 45° and 60° with the positive direction of the axis of x and y makes with the positive direction of z-axis, and angle of

A. 60°

B. 120°

C. 60° and 120°

D. None of these

Answer: C

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10. The shortest distance between the lines :

$$\frac{x-3}{3}=\frac{y-8}{-1}=\frac{z-3}{1}$$ and

$$\frac{x+3}{-3}=\frac{y+7}{2}=\frac{z-6}{4}$$ is :

A. $\sqrt{30}$

B. $2\sqrt{30}$

C. $5\sqrt{30}$

D. $3\sqrt{30}$

Answer: D

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