SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 1**

Topic :- THREE DIMENSIONAL GEOMETRY

1. If the lines

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

$$and\ \frac{x-3}{1}=\frac{y-k}{2}=\frac{z}{1}$$

interested, then the value of k is

a) $\frac{3}{2}$ b) $\frac{9}{2}$ c) $-\frac{2}{9}$ d) $-\frac{3}{2}$

2. A point on x-axis which is equidistance from both the points $(1, 2, 3)$ and $(3, 5, -2)$ is

a) $(-6, 0, 0)$ b) $(5, 0, 0)$ c) $(-5, 0, 0)$ d) $(6, 0, 0)$

3. The angle between the line

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

a) $sin^{-1}\left(\frac{1}{7}\right)$ b) $cos^{-1}\left(\frac{2}{7}\right)$ c) $cos^{-1}\left(\frac{1}{7}\right)$ d) None of these

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

a) -2 b) 2 c) 3 d) -1

5. The equation of the plane through the point $(2, 5, -3)$ perpendicular to the planes $x+2y+2z=1$ and $x-2y+3z=4$ is

a) $3x-4y+2z-20=0$ b) $7x-y+5z=30$
c) $x-2y+z=11$ d) $10x-y-4z=27$

6. The direction cosines of the line $4x-4=1-3y=2z-1$ are

a) $\frac{3}{\sqrt{56}}, \frac{-4}{\sqrt{56}}, \frac{6}{\sqrt{56}}$ b) $\frac{3}{\sqrt{29}}, \frac{-4}{\sqrt{29}}, \frac{6}{\sqrt{29}}$ c) $\frac{3}{\sqrt{61}}, \frac{-4}{\sqrt{61}}, \frac{6}{\sqrt{61}}$ d) $4, -3, 2$

7. Equation of the plane passing through the intersection of the planes $x+y+z=6$ and $2x+3y+4z+5=0$ and the point $(1, 1, 1)$ is

a) $20x+23y+26z-69=0$ b) $31x+45y+49z+52=0$
c) $8x+5y+2z-69=0$ d) $4x+5y+6z-7=0$

8. The equation of the plane through the point $(0, -4, -6)$ and $(-2, 9, 3)$ and perpendicular to the plane $x-4y-2z=8$ is

a) $3x+3y-2z=0$ b) $x-2y+z=2$ c) $2x+y-z=2$ d) $5x-3y+2z=0$

9. If a line makes angle $\frac{\pi}{3}$ and $\frac{\pi}{4}$ with the $x\ and\ y$-axes respectively, then the angle made by the line and z-axis is

a) $\frac{\pi}{2}$ b) $\frac{\pi}{3}$ c) $\frac{\pi}{4}$ d) $\frac{5\pi}{12}$

10. Let $(3,4,-1) and$ $(-1,2,3)$ are the end points of a diameter of sphere. Then the radius of the sphere is equal to

a) 1 b) 2 c) 3 d) 9

11. The points $(5,-4,2),(4,-3,1),(7,-6,4)$ and $(8,-7,5)$ are the vertices of

a) A rectangle b) A square c) A parallelogram d) None of these

12. The equation of the plane containing the lines $\vec{r}=\overrightarrow{a_1}+\lambda\,\vec{b}$ and $\vec{r}=\overrightarrow{a_2}+\mu\,\vec{b}$, is

a) $\vec{r}\cdot(\overrightarrow{a_1}-\overrightarrow{a_2})\times\vec{b}=[\overrightarrow{a_1}\,\overrightarrow{a_2}\,\vec{b}]$

b) $\vec{r}\cdot(\overrightarrow{a_2}-\overrightarrow{a_1})\times\vec{b}=[\overrightarrow{a_1}\,\overrightarrow{a_2}\,\vec{b}]$

c) $\vec{r}\cdot(\overrightarrow{a_1}+\overrightarrow{a_2})\times\vec{b}=[\overrightarrow{a_2}\,\overrightarrow{a_1}\,\vec{b}]$

d) None of these

13. If $\left(\frac{1}{2},\frac{1}{3},n\right)$ are the direction cosines of a line, then the value of n is

a) $\frac{\sqrt{23}}{6}$ b) $\frac{23}{6}$ c) $\frac{2}{3}$ d) $\frac{3}{2}$

14. The vector equation of the plane passing through the origin and the line of intersection of the plane $\vec{r}\cdot\vec{a}=\lambda$ and $\vec{r}\cdot\vec{b}=\mu$ is

a) $\vec{r}\cdot(\lambda\,\vec{a}-\mu\,\vec{b})=0$ b) $\vec{r}\cdot(\lambda\,\vec{b}-\mu\,\vec{a})=0$ c) $\vec{r}\cdot(\lambda\,\vec{a}+\mu\,\vec{b})=0$ d) $\vec{r}\cdot(\lambda\,\vec{b}+\mu\,\vec{a})=0$

15. If l_1,m_1,n_1 and l_2,m_2,n_2 are direction cosines of the two lines inclined to each other at an angle , then the direction cosines of the external bisector of the angle between the lines are

a) $\frac{l_1+l_2}{2sinsin\,\theta/2},\frac{m_1+m_2}{2sinsin\,\theta/2},\frac{n_1+n_2}{2sinsin\,\theta/2}$

b) $\frac{l_1+l_2}{2coscos\,\theta/2},\frac{m_1+m_2}{2coscos\,\theta/2},\frac{n_1+n_2}{2coscos\,\theta/2}$

c) $\frac{l_1-l_2}{2sinsin\,\theta/2},\frac{m_1-m_2}{2sinsin\,\theta/2},\frac{n_1-n_2}{2sinsin\,\theta/2}$

d) $\frac{l_1-l_2}{2coscos\,\theta/2},\frac{m_1-m_2}{2coscos\,\theta/2},\frac{n_1-n_2}{2coscos\,\theta/2}$

16. The direction ratios of the normal to the plane passing through the points $(1,-2,3),(-1,2,-1)$ and parallel to the line $\frac{x-2}{2}=\frac{y+1}{3}=\frac{z}{4}$ are proportional to

a) 2, 3, 4 b) 4, 0, 7 c) $-2,0,-1$ d) $2,0,-1$

17. The position vector of a point at a distance of $3\sqrt{11}$ units from $\hat{\imath}-\hat{\jmath}+2\hat{k}$ on a line passing through the points $\hat{\imath}-\hat{\jmath}+2\hat{k}$ and $3\hat{\imath}+\hat{\jmath}+\hat{k}$ is

a) $10\hat{\imath}+2\hat{\jmath}-5\hat{k}$ b) $-8\hat{\imath}-4\hat{\jmath}-\hat{k}$ c) $8\hat{\imath}+4\hat{\jmath}+\hat{k}$ d) $-10\hat{\imath}-2\hat{\jmath}-5\hat{k}$

18. The centre and radius of the sphere $x^2+y^2+z^2+3x-4z+1=0$ are

a) $\left(-\frac{3}{2},0,-2\right),\frac{\sqrt{21}}{2}$ b) $\left(\frac{3}{2},0,2\right),\sqrt{21}$ c) $\left(-\frac{3}{2},0,2\right)\cdot\frac{\sqrt{21}}{2}$ d) $\left(-\frac{3}{2},2,0\right),\frac{21}{2}$

19. The direction cosines of the line $6\,x-2=3\,y+1=2\,z-2$ are

a) $\frac{1}{\sqrt{3}},\frac{1}{\sqrt{3}},\frac{1}{\sqrt{3}}$ b) $\frac{1}{\sqrt{14}},\frac{2}{\sqrt{14}},\frac{3}{\sqrt{14}}$ c) 1, 2, 3 d) None of these

20. The cartesian equation of the plane perpendicular to the line $\frac{x-1}{2}=\frac{y-3}{-1}=\frac{z-4}{2}$ and passing through the origin is

a) $2x-y+2z-7=0$ b) $2x+y+2z=0$ c) $2x-y+2z=0$ d) $2x-y-z=0$

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 2**

Topic :- THREE DIMENSIONAL GEOMETRY

1. The point of intersection of the lines

$$\frac{x-5}{3}=\frac{y-7}{-1}=\frac{z+2}{1},\frac{x+3}{-36}=\frac{y-3}{2}=\frac{z-6}{4}$$

is

a) $(2,10,-4)$ **b)** $\left(21,\frac{5}{3},\frac{10}{3}\right)$ **c)** $(5,-7,-2)$ **d)** $(-3,3,6)$

2. If the position vectors of the points A and B are $3\hat{\imath}+\hat{\jmath}+2\hat{k}$ and $\hat{\imath}-2\hat{\jmath}-4\hat{k}$ respectively, then the equation of the plane through B and perpendicular to AB is

a) $2x+3y+6z+28=0$
b) $3x+2y+6z=28$
c) $2x-3y+6z+28=0$
d) $3x-2y+6z=28$

3. The point equidistant from the point $(a,0,0)$, $(0,b,0)$, $(0,0,c)$ ad **(0, 0, 0)** is

a) $\left(\frac{a}{3},\frac{b}{3},\frac{c}{3}\right)$ **b)** (a,b,c) **c)** $\left(\frac{a}{2},\frac{b}{2},\frac{c}{2}\right)$ **d)** None of these

4. If a plane meets the coordinate axes at A,B and C such that the centroid of the triangle is (1,2,4), then the equation of the plane is

a) $x+2y+4z=12$ **b)** $4x+2y+z=12$ **c)** $x+2y+4z=3$ **d)** $4x+2y+z=3$

5. If the coordinates of the vertices of a $\Delta\ ABC$ are $A(-1,3,2)$, $B(2,3,5)$ and $C(3,5,-2)$, then $\angle A$ is equal to

a) $45°$ **b)** $60°$ **c)** $90°$ **d)** $30°$

6. The distance between the line
$\vec{r}=2\hat{\imath}-2\hat{\jmath}+3\hat{k}+\lambda(\hat{\imath}-\hat{\jmath}+4\hat{k})$ and the plane $\vec{r}\cdot(\hat{\imath}+5\hat{\jmath}+\hat{k})=5$ is

a) $\frac{10}{3}$ **b)** $\frac{3}{10}$ **c)** $\frac{10}{3\sqrt{3}}$ **d)** $\frac{10}{9}$

7. A point on XOZ- plane divides the join of $(5,-3,-2)$ and $(1,2,-2)$ at

a) $\left(\frac{13}{5},0,-2\right)$
b) $\left(\frac{13}{5},0,2\right)$
c) **(5,0,2)**
d) $(5,0,-2)$

8. A plane makes intercepts $-6,3,4$ upon the coordinate axes. Then, the length of the perpendicular from the origin on it is

a) $\frac{2}{\sqrt{29}}$ **b)** $\frac{3}{\sqrt{29}}$ **c)** $\frac{4}{\sqrt{29}}$ **d)** $\frac{12}{\sqrt{29}}$

9. The equation of the plane counting the lines

$$\frac{x-1}{2}=\frac{y+1}{-1}=\frac{z}{3}\ and\ \frac{x}{2}=\frac{y-2}{-1}=\frac{z+1}{3}\ is$$

a) $8x-y+5z-8=0$ **b)** $8x+y-5z-7=0$ **c)** $x-8y+3z+6=0$ **d)** $8x+y-5z+7=0$

10. The equation of the plane which bisects the line joining (2, 3,4) and (6, 7, 8), is

a) $x-y-z-15=0$ **b)** $x-y+z-15=0$ **c)** $x+y+z-15=0$ **d)** $x+y+z+15=0$

11. The distance between the points (1,4,5) and (2,2,3) is

a) 5 **b)** 4 **c)** 3 **d)** 2

12. The equation of the plane through the points (1, 2, 3), $(-1,4,2) and\ (3,1,1)$ is

a) $5x+y+12z-23=0$ **b)** $5x+6y+2z-23=0$

c) $x+6y+2z-13=0$ **d)** $x+y+z-13=0$

13. Equation of the plane parallel to the planes $x+2y+3z-5=0, x+2y+3z-7=0$ and equidistant from them is

a) $x+2y+3z-6=0$ **b)** $x+2y+3z-1=0$

c) $x+2y+3z-8=0$ **d)** $x+2y+3z-3=0$

14. The image of the point (1, 2, 3) in lie $\frac{x}{2}=\frac{y-1}{3}=\frac{z-1}{3}$ is

a) $\left(1,\frac{5}{2},\frac{5}{2}\right)$ **b)** $\left(1,\frac{9}{4},\frac{11}{4}\right)$ **c)** (1, 3, 2) **d)** (3, 1, 2)

15. If O is the origin and $OP=3$ with direction ratios $-1, 2, -2$, then coordinates of P are

a) (1, 2, 2) **b)** $(-1,2,-2)$ **c)** $(-3,6,-9)$ **d)** $(-1/3,2/3,-2/3)$

16. The equation of the sphere touching the three coordinate planes is

a) $x^2+y^2+z^2+2a(x+y+z)+2a^2=0$ **b)** $x^2+y^2+z^2-2a(x+y+z)+2a^2=0$

c) $x^2+y^2+z^2\pm 2a(x+y+z)+2a^2=0$ **d)** $x^2+y^2+z^2\pm 2ax\pm 2ay\pm 2az+2a^2=0$

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

a) $45°$ **b)** $0°$ **c)** $\left(\frac{24}{\sqrt{29}\sqrt{22}}\right)$ **d)** $90°$

18. The equation of a line of intersection of planes $4x+4y-5z=12$ and $8x+12y-13z=32$ can be written as

a) $\frac{x-1}{2}=\frac{y+2}{-3}=\frac{z}{4}$ **b)** $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z}{4}$ **c)** $\frac{x}{2}=\frac{y+1}{3}=\frac{z-2}{4}$ **d)** $\frac{x}{2}=\frac{y}{3}=\frac{z-2}{4}$

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

a) $(6,-17)$ **b)** $(-6,7)$ **c)** $(5,-15)$ **d)** $(-5,15)$

20. If a line makes angles α,β,γ and δ with four diagonals of a cube, then the value of $sin^2\alpha+sin^2\beta+sin^2\gamma+sin^2\delta$, is

a) $\frac{4}{3}$ **b)** $\frac{8}{3}$ **c)** $\frac{7}{3}$ **d)** 1

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 3**

Topic :- THREE DIMENSIONAL GEOMETRY

1. Find the direction ratio of
$$\frac{3-x}{1}=\frac{y-2}{5}=\frac{2z-3}{1}$$
a) $1:5:\frac{1}{2}$ b) $-1:5:1$ c) $-1:5:\frac{1}{2}$ d) $1:5:1$

2. If l_1, m_1, n_1 and l_2, m_2, n_2 are direction cosines of the two lines inclined to each other at an angle θ, then the direction cosines of internal bisector of the angle between these lines are
a) $\frac{l_1+l_2}{2\sin\frac{\theta}{2}}, \frac{m_1+m_2}{2\sin\frac{\theta}{2}}, \frac{n_1+n_2}{2\sin\frac{\theta}{2}}$ b) $\frac{l_1+l_2}{2\cos\frac{\theta}{2}}, \frac{m_1+m_2}{2\cos\frac{\theta}{2}}, \frac{n_1+n_2}{2\cos\frac{\theta}{2}}$
c) $\frac{l_1-l_2}{2\sin\frac{\theta}{2}}, \frac{m_1-m_2}{2\sin\frac{\theta}{2}}, \frac{n_1-n_2}{2\sin\frac{\theta}{2}}$ d) $\frac{l_1-l_2}{2\cos\frac{\theta}{2}}, \frac{m_1-m_2}{2\cos\frac{\theta}{2}}, \frac{n_1-n_2}{2\cos\frac{\theta}{2}}$

3. The plane $\frac{x}{2}+\frac{y}{3}+\frac{z}{4}=1$, cuts the axes in A, B, C, then the area of the ΔABC, is
a) $\sqrt{29}$ sq units b) $\sqrt{41}$ sq units c) $\sqrt{61}$ sq units d) None of these

4. If the planes $\vec{r}\cdot(2\hat{\imath}-\lambda\hat{\jmath}+3\hat{k})=0$ and $\vec{r}\cdot(\lambda\hat{\imath}+5\hat{\jmath}-\hat{k})=5$ are perpendicular to each other, then value of $\lambda^2+\lambda$, is
a) 0 b) 2 c) 3 d) 1

5. If a sphere of radius r passes through the origin, then the extremities of the diameter parallel to x-axis lie on each of the spheres
a) $x^2+y^2+z^2\pm 2rx=0$ b) $x^2+y^2+z^2\pm 2ry=0$
c) $x^2+y^2+z^2\pm 2rz=0$ d) $x^2+y^2+z^2\pm 2ry\pm 2rz=0$

6. If the distance of the point (1, 1,1) from the origin is half is distance from the plane $x+y+z+k=0$, then k is equal to
a) ± 3 b) ± 6 c) $-3, 9$ d) $3, -9$

7. XOZ plane divides the join of (2, 3, 1) and (6, 7, 1) in the ratio
a) 3 : 7 b) 2 : 7 c) $-3:7$ d) $-2:7$

8. The point on the line $\frac{x-2}{1}=\frac{y+3}{-2}=\frac{z+5}{-2}$ at a distance of 6 from the point $(2, -3, -5)$ is
a) $(3, -5, -3)$ b) $(4, -7, -9)$ c) $(0, 2, -1)$ d) $(-3, 5, 3)$

9. The direction ratios of a normal to the plane passing through (0, 0, 1), (0, 1, 2) and (1, 2, 3) are proportional to

a) $0, 1, -1$ b) $1, 0, -1$ c) $0, 0, -1$ d) $1, 0, 0$

10. Ratio in which the xy-plane divides the join of (1, 2, 3) and (4, 2, 1) is

a) 3 : 1 internally b) 3 : 1 externally c) 1 : 2 internally d) 2 : 1 externally

11. A vector $\vec{r}$ is equally inclined with the coordinate axes. If the tip of $\vec{r}$ is in the positive octant and $|\vec{r}| = 6$, then $\vec{r}$ is

a) $2\sqrt{3}(\hat{\imath} - \hat{\jmath} + \hat{k})$ b) $2\sqrt{3}(-\hat{\imath} + \hat{\jmath} + \hat{k})$ c) $2\sqrt{3}(\hat{\imath} + \hat{\jmath} - \hat{k})$ d) $2\sqrt{3}(\hat{\imath} + \hat{\jmath} + \hat{k})$

12. The angle between the planes $2x - y + z = 6$ and $x + y + 2z = 3$ is

a) $\pi/3$ b) $\cos^{-1}(1/6)$ c) $\pi/4$ d) $\pi/6$

13. The vector equation of the plane through the point $2\,\hat{\imath} - \hat{\jmath} - 4\,\hat{k}$ and parallel to the plane $\vec{r} \cdot (4\,\hat{\imath} - 12\,\hat{\jmath} - 3\,\hat{k}) - 7 = 0$, is

a) $\vec{r} \cdot (4\,\hat{\imath} - 12\,\hat{\jmath} - 3\,\hat{k}) = 0$

b) $\vec{r} \cdot (4\,\hat{\imath} - 12\,\hat{\jmath} - 3\,\hat{k}) = 32$

c) $\vec{r} \cdot (4\,\hat{\imath} - 12\,\hat{\jmath} - 3\,\hat{k}) = 12$

d) None of these

14. An equation of the line passing through $3\hat{\mathbf{i}} - 5\hat{\mathbf{j}} + 7\hat{\mathbf{k}}$ and perpendicular to the plane $3x - 4y = 5z = 8$ is

a) $\frac{x-3}{3} = \frac{y+5}{-4} = \frac{z-7}{5}$ b) $\frac{x-3}{3} = \frac{y+4}{-5} = \frac{z-5}{7}$

c) $\vec{\mathbf{r}} = 3\hat{\mathbf{i}} + 5\hat{\mathbf{j}} - 7\hat{\mathbf{k}} + \lambda(3\hat{\mathbf{i}} - 4\hat{\mathbf{j}} - 5\hat{\mathbf{k}})$ d) $\vec{\mathbf{r}} = 3\hat{\mathbf{i}} - 4\hat{\mathbf{j}} - 5\hat{\mathbf{k}} + \mu(3\hat{\mathbf{i}} + 5\hat{\mathbf{j}} + 7\hat{\mathbf{k}})$

λ, μ are parameters

15. The equation of a line is $6x - 2 = 3y - 1 = 2z - 2$ The direction ratios of the line are

a) 1,2,3 b) 1 ,1, 1 c) $\frac{1}{3}, \frac{1}{3}, \frac{1}{3}$ d) $\frac{1}{3}, \frac{-1}{3}, \frac{1}{3}$

16. Angle between the line $\vec{r} = (2\hat{\imath} - \hat{\jmath} + \hat{k}) + \lambda(-\hat{\imath} + \hat{\jmath} + \hat{k})$ and the plane $\vec{r} \cdot (3\hat{\imath} + 2\hat{\jmath} - \hat{k}) = 4$ is

a) $\cos^{-1}\left(\frac{2}{\sqrt{42}}\right)$ b) $\cos^{-1}\left(\frac{-2}{\sqrt{42}}\right)$ c) $\sin^{-1}\left(\frac{2}{\sqrt{42}}\right)$ d) $\sin^{-1}\left(\frac{-2}{\sqrt{42}}\right)$

17. A mirror and a source of light are situated at the origin O and at a point on OX respectively. A ray of light from the source strikes the mirror and is reflected. If the direction ratios of the normal to the plane are proportional to $1, -1, 1$, then direction cosines of the reflected ray are

a) $\frac{1}{2}, \frac{2}{3}, \frac{2}{3}$ b) $-\frac{1}{2}, \frac{2}{3}, \frac{2}{3}$ c) $-\frac{1}{3}, -\frac{2}{3}, -\frac{2}{3}$ d) $-\frac{1}{2}, -\frac{2}{3}, \frac{2}{3}$

18. If the direction ratio of two lines are given by $3lm - 4ln + mn = 0$ and $l + 2m + 3n = 0$, then the angle between the line is

a) $\frac{\pi}{6}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{3}$ d) $\frac{\pi}{2}$

19. The points $A(-1,3,0), B(2,2,1)$ and $C(1,1,3)$ determine a plane. The distance from the plane to the point $D(5,7,8)$ is

a) $\sqrt{66}$ b) $\sqrt{71}$ c) $\sqrt{73}$ d) $\sqrt{76}$

20. The line of intersection of the planes $\vec{r}\cdot\left(3\hat{\imath}-\hat{\jmath}+\hat{k}\right)=1$ and $\vec{r}\cdot\left(\hat{\imath}+4\hat{\jmath}-2\hat{k}\right)=2$ is parallel to the vector

a) $-2\hat{\imath}+7\hat{\jmath}+13\hat{k}$ b) $2\hat{\imath}+7\hat{\jmath}-13\hat{k}$ c) $-2\hat{\imath}-7\hat{\jmath}+13\hat{k}$ d) $2\hat{\imath}+7\hat{\jmath}+13\hat{k}$

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SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 4**

Topic :- THREE DIMENSIONAL GEOMETRY

1. The equation of the line of intersection of planes
$4x+4y-5z=12, 8x+12y-13z=32$ can be written as
a) $\frac{x-1}{2}=\frac{y+2}{-3}=\frac{z}{4}$ b) $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z}{4}$ c) $\frac{x}{2}=\frac{y+1}{3}=\frac{z-2}{4}$ d) $\frac{x}{2}=\frac{y}{3}=\frac{z-2}{4}$

2. The vector equation of the line of intersection of the planes $\vec{r}\cdot(\hat{\imath}+2\hat{\jmath}+3\hat{k})=0$ and $\vec{r}\cdot(3\hat{\imath}+2\hat{\jmath}+\hat{k})=0$, is
a) $\vec{r}=\lambda(\hat{\imath}+2\hat{\jmath}+\hat{k})$ b) $\vec{r}=\lambda(\hat{\imath}-2\hat{\jmath}+3\hat{k})$ c) $\vec{r}=\lambda(\hat{\imath}+2\hat{\jmath}-3\hat{k})$ d) None of these

3. Let a plane passes through the point $P(-1,-1,1)$ and also passes through a line joining the points $Q(0,1,1)Q(0,1,1)$and $R(0,0,2)$. Then the distance of the plane from the point $(0,0,0)$ is
a) 3 b) 0 c) $\frac{1}{\sqrt{6}}$ d) $\frac{2}{\sqrt{6}}$

4. The direction cosines of the line passing through $P(2,3,-1)$ and the origin are
a) $\frac{2}{\sqrt{14}},\frac{-3}{\sqrt{14}},\frac{1}{\sqrt{14}}$ b) $\frac{2}{\sqrt{14}},\frac{-3}{\sqrt{14}},\frac{1}{\sqrt{14}}$ c) $\frac{-2}{\sqrt{14}},\frac{-3}{\sqrt{14}},\frac{1}{\sqrt{14}}$ d) $\frac{2}{\sqrt{14}},\frac{-3}{\sqrt{14}},\frac{-1}{\sqrt{14}}$

5. The shortest distance from the point $(1,2,-1)$ to the surface of the sphere
$x^2+y^2+z^2=54$ is
a) $3\sqrt{6}$ b) $2\sqrt{6}$ c) $\sqrt{6}$ d) 2

6. The shortest distance between the lines
$\frac{x-2}{3}=\frac{y+3}{4}=\frac{z-1}{5}$ and
$$\frac{x-5}{1}=\frac{y-1}{2}=\frac{z-6}{3}$$ is
a) 3 b) 2 c) 1 d) 0

7. The image of the point $P(1,3,4)$ in the plane $2x-y+z+3=0$ is
a) $(3,5,-2)$ b) $(-3,5,2)$ c) $(3,-5,2)$ d) $(-1,4,2)$

8. The vector from of the sphere $2(x^2+y^2+z^2)-4x+6y+8z-5=0$ is
a) $\vec{\mathbf{r}}\cdot[\vec{\mathbf{r}}-(2\hat{\mathbf{i}}+\hat{\mathbf{j}}+\hat{\mathbf{k}})]=\frac{2}{5}$ b) $\vec{\mathbf{r}}\cdot[\vec{\mathbf{r}}-(2\hat{\mathbf{i}}-3\hat{\mathbf{j}}-4\hat{\mathbf{k}})]=\frac{1}{2}$
c) $\vec{\mathbf{r}}\cdot[\vec{\mathbf{r}}-(2\hat{\mathbf{i}}+3\hat{\mathbf{j}}+4\hat{\mathbf{k}})]=\frac{5}{2}$ d) $\vec{\mathbf{r}}\cdot[\vec{\mathbf{r}}-(2\hat{\mathbf{i}}-3\hat{\mathbf{j}}-4\hat{\mathbf{k}})]=\frac{5}{2}$

9. The angle between the line $\frac{x-1}{2}=\frac{y-2}{1}=\frac{z+3}{-2}$ and the plane $x+y+4=0$, is

a) $0°$ b) $30°$ c) $45°$ d) $90°$

10. The equation to the straight line passing through the points $(4,-5,-2)$ and $(-1,5,3)$ is

a) $\frac{x-4}{1}=\frac{y+5}{-2}=\frac{z+2}{-1}$ b) $\frac{x+1}{1}=\frac{y-5}{2}=\frac{z-3}{-1}$

c) $\frac{x}{-1}=\frac{y}{5}=\frac{z}{3}$ d) $\frac{x}{4}=\frac{y}{-5}=\frac{z}{-2}$

11. The reflection of the plane $2x-3y+4z-3=0$ in the plane $x-y+z-3=0$ is the plane

a) $4x-3y+2z-15=0$ b) $x-3y+2z-15=0$

c) $4x+3y-2z+15=0$ d) None of these

12. The equation of the plane passing through the line of intersection of the planes $x+y+z=6$ and $2x+3y+4z+5=0$ and perpendicular to the plane $4x+5y-3z=8$ is

a) $x+7y+13z-96=0$ b) $x+7y+13z+96=0$

c) $x+7y-13z-96=0$ d) $x-7y+13z+96=0$

13. The distance between the line $\vec{r}=2\hat{\imath}-2\hat{\jmath}+3\hat{k}+\lambda(\hat{\imath}-\hat{\jmath}+4\hat{k})$ and the plane $\vec{r}\cdot(\hat{\imath}+5\hat{\jmath}+\hat{k})=5$, is

a) $\frac{10}{3\sqrt{3}}$ b) $\frac{10}{3}$ c) $10/9$ d) None of these

14. The angle between the line $\frac{x-3}{2}=\frac{y-1}{1}=\frac{z+4}{-2}$ and the plane, $x+y+z+5=0$ Is

a) $\sin^{-1}\left(\frac{2}{\sqrt{3}}\right)$ b) $\sin^{-1}\left(\frac{1}{\sqrt{3}}\right)$ c) $\frac{\pi}{4}$ d) $\sin^{-1}\left(\frac{1}{3\sqrt{3}}\right)$

15. If for a plane, the intercepts on the coordinate axes are 8, 4, 4, then the length of the perpendicular from the origin to the plane is

a) $8/3$ b) $3/8$ c) 3 d) $4/3$

16. A line makes acute angles of α, β and γ with the coordinate axes such that

$\cos\alpha\cos\beta=\cos\beta\cos\gamma=\frac{2}{9}$

And $\cos\gamma\cos\alpha=\frac{4}{9}$,

Then $\cos\alpha+\cos\beta+\cos\gamma$ is equal To

a) $\frac{25}{9}$ b) $\frac{5}{9}$ c) $\frac{5}{3}$ d) $\frac{2}{3}$

17. The equation of the plane passing through the mid-point of the line segment of join of the points $P(1,2,3)$ and $Q(3,4,5)$ and perpendicular to it is

a) $x+y+z=9$ b) $x+y+z=-9$ c) $2x+3y+4z=9$ d) $2x+3y+4z=-9$

18. The intersection of the sphere $x^2+y^2+z^2+7x-2y-z=1$ and $x^2+y^2+z^2-3x+3y+4z=-4$ is same as the intersection of one of the spheres and the plane is

a) $2x-y-z=1$ b) $-2x+y+z=1$ c) $2x-y+z=1$ d) $2x+y+z=1$

19. The equation of the plane which passes through the point $(2,-3,1)$ and perpendicular to the line joining points $(3,4,-1)$ and $(2,-1,5)$, is

a) $x+5y-6z+19=0$ b) $x-5y+6z-19=0$

c) $x+5y+6z+19=0$ d) $x-5y-6z-19=0$

20. The vector equation of the straight line

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

a) $\vec{\mathbf{r}}=(\hat{\mathbf{i}}-\hat{\mathbf{j}}+3\hat{\mathbf{k}})+\lambda(3\hat{\mathbf{i}}+2\hat{\mathbf{j}}-\hat{\mathbf{k}})$ b) $\vec{\mathbf{r}}=(\hat{\mathbf{i}}-\hat{\mathbf{j}}+3\hat{\mathbf{k}})+\lambda(3\hat{\mathbf{i}}-2\hat{\mathbf{j}}-\hat{\mathbf{k}})$

c) $\vec{\mathbf{r}}=(3\hat{\mathbf{i}}-2\hat{\mathbf{j}}-\hat{\mathbf{k}})+\lambda(\hat{\mathbf{i}}-\hat{\mathbf{j}}+3\hat{\mathbf{k}})$ d) $\vec{\mathbf{r}}=(3\hat{\mathbf{i}}+2\hat{\mathbf{j}}-\hat{\mathbf{k}})+\lambda(\hat{\mathbf{i}}-\hat{\mathbf{j}}+3\hat{\mathbf{k}})$

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SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 5**

Topic :- THREE DIMENSIONAL GEOMETRY

1. The plane $\frac{x}{2}+\frac{y}{3}+\frac{z}{4}=1$ cuts the coordinate axes in A, B, C then the area of the ΔABC is
   a) $\sqrt{29}$ sq units b) $\sqrt{41}$ sq units c) $\sqrt{61}$ sq units d) None of these

2. A line makes acute angles of α, β and γ with the coordinate axes such that $\cos\alpha\cos\beta = \cos\beta\cos\gamma = \frac{2}{9}$ and $\cos\gamma\cos\alpha = \frac{4}{9}$, then $\cos\alpha+\cos\beta+\cos\gamma$ is equal to
   a) $\frac{25}{9}$ b) $\frac{5}{9}$ c) $\frac{5}{3}$ d) $\frac{2}{3}$

3. The equation of the plane containing the line $\vec{r} = \hat{\imath}+\hat{\jmath}+\lambda(2\hat{\imath}+\hat{\jmath}+4\hat{k})$, is
   a) $\vec{r}\cdot(\hat{\imath}+2\hat{\jmath}-\hat{k})=3$ b) $\vec{r}\cdot(\hat{\imath}+2\hat{\jmath}-\hat{k})=6$ c) $\vec{r}\cdot(-\hat{\imath}-2\hat{\jmath}+\hat{k})$ d) None of these

4. If OA is equally inclined to OX, OY and OZ and if A is $\sqrt{3}$ units from the origin, then A is
   a) $(3, 3, 3)$ b) $(-1, 1, -1)$ c) $(-1, 1, 1)$ d) $(1, 1, 1)$

5. If a plane meets the coordinate axes at A, B and C such that the centroid of the triangle is (1, 2, 4) then the equation of the plane is
   a) $x+2y+4z=12$ b) $4x+2y+z=12$ c) $x+2y+4z=3$ d) $4x+2y+z=3$

6. The equation of the plane passing through the midpoint of the line of join of the points (1, 2, 3) and (3, 4, 5) and perpendicular to it is
   a) $x+y+z=9$ b) $x+y+z=-9$ c) $2x+3y+4z=9$ d) $2x+3y+4z=-9$

7. 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) $a=6, b=4$

8. The image of the point $(5, 4, 6)$ in the plane $x+y+2z-15=0$ is
   a) $(3, 2, 2)$ b) $(2, 3, 2)$ c) $(2, 2, 3)$ d) $(-5, -4, -6)$

9. If α, β, γ be the angle which a line makes with the coordinate axes, then
   a) $\sin^2\alpha+\cos^2\beta+\sin^2\gamma=1$ b) $\sin^2\alpha+\sin^2\beta+\sin^2\gamma=1$
   c) $\cos^2\alpha+\cos^2\beta+\sin^2\gamma=1$ d) $\sin^2\alpha+\cos^2\beta+\sin^2\gamma=1$

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10. The angle between the lines whose direction cosines are given by the equation $l^2 + m^2 - n^2 = 0, l + m + n = 0$, is

a) $\frac{\pi}{6}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{3}$ d) $\frac{\pi}{2}$

11. Equation of plane passing through the points (2, 2, 1), (9, 3, 6) and perpendicular to the plane $2x + 6y + 6z - 1 = 0$, is

a) $3x + 4y + 5z = 9$ b) $3x + 4y - 5z + 9 = 0$ c) $3x + 4y - 5z - 9 = 0$
d) None of these

12. The vector equation of the plane passing through the origin and the line of intersection of the plane $\vec{\mathbf{r}} \cdot \vec{\mathbf{a}} = \lambda$ and $\vec{\mathbf{r}} \cdot \vec{\mathbf{b}} = \mu$, is

a) $\vec{\mathbf{r}} \cdot (\lambda \vec{\mathbf{a}} - \mu \vec{\mathbf{b}}) = 0$ b) $\vec{\mathbf{r}} \cdot (\lambda \vec{\mathbf{b}} - \mu \vec{\mathbf{a}}) = 0$ c) $\vec{\mathbf{r}} \cdot (\lambda \vec{\mathbf{a}} + \mu \vec{\mathbf{b}}) = 0$ d) $\vec{\mathbf{r}} \cdot (\lambda \vec{\mathbf{b}} + \mu \vec{\mathbf{a}}) = 0$

13. The shortest distance between the lines $\vec{r} = (\hat{\imath} + 2\hat{\jmath} + \hat{k}) + \lambda(2\hat{\imath} + \hat{\jmath} + 2\hat{k})$ and, $\vec{r} = 2\hat{\imath} - \hat{\jmath} - \hat{k} + \mu(2\hat{\imath} + \hat{\jmath} + 2\hat{k})$, is

a) 0 b) $\sqrt{101}/3$ c) $101/3$ d) None of these

14. A straight line which makes an angle of 60° with each of y and z-axes, this line makes with x-axis at an angle

a) 30° b) 60° c) 75° d) 45°

15. If the straight lines $\frac{x-1}{k} = \frac{y-2}{2} = \frac{z-3}{3}$ and $\frac{x-2}{3} = \frac{y-3}{k} = \frac{z-1}{3}$
Intersect at a point, then the integer k is equal to

a) -2 b) -5 c) 5 d) 2

16. The cosine of the angle A of the triangle with verities $A(1, -1, 2), B(6, 11, 2), C(1, 2, 6)$ is

a) 63/65 b) 36/65 c) 16/65 d) 13/64

17. The angle between a line whose direction ratios are in the ratio 2:2:1 and a line joining (3, 1, 4) to (7, 2, 12) is

a) $\cos^{-1}(2/3)$ b) $\cos^{-1}(-2/3)$ c) $\tan^{-1}(2/3)$ d) None of these

18. The equation of the plane passing through (1, 1, 1) and (1, −1, −1) and perpendicular to $2x - y + z + 5 = 0$ is

a) $2x + 5y + z - 8 = 0$ b) $x + y - z - 1 = 0$ c) $2x + 5y + z + 4 = 0$ d) $x - y + z - 1 = 0$

19. The distance of origin from the point of intersection of the line
$\frac{x}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and the plane $2x + y - z = 2$ is

a) $\sqrt{120}$ b) $\sqrt{83}$ c) $2\sqrt{19}$ d) $\sqrt{78}$

20. Consider the following statements:

1. Line joining (1, 2, 5); (4, 3, 2) is parallel to the line joining (5, 1, −11), (8, 2,−8)

2. Three concurrent lines with DC′$s(l_i, m_i, n_i) i = 1,2,3$ are

Coplanar, if $\begin{vmatrix} l_1 & m_1 & n_1 \\ l_2 & m_2 & n_2 \\ l_3 & m_3 & n_3 \end{vmatrix} = 0$

3. The plane $x - 2y + z = 21$ and the line $\frac{x-1}{1} = \frac{y-2}{2} = \frac{z-1}{3}$ are parallel

Which of these is/are correct?

a) (1)and (2) b) (2) and (3) c) (3) and (1) d) (1), (2) and (3)

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SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 6**

Topic :- THREE DIMENSIONAL GEOMETRY

1. The distance of the point $P(2,3,4)$ from the line
$1-x=\frac{y}{2}=\frac{1}{3}(1+z)$is

a) $\frac{1}{7}\sqrt{35}$ b) $\frac{4}{7}\sqrt{35}$ c) $\frac{2}{7}\sqrt{35}$ d) $\frac{3}{7}\sqrt{35}$

2. The equation of the line of intersection of the planes $x+2y+z=3$ and $6x+8y+3z=13$ can be written as

a) $\frac{x-2}{2}=\frac{y+1}{-3}=\frac{z-3}{4}$
b) $\frac{x-2}{2}=\frac{y+1}{3}=\frac{z-3}{4}$
c) $\frac{x+2}{2}=\frac{y-1}{-3}=\frac{z-3}{4}$
d) $\frac{x+2}{2}=\frac{y+2}{3}=\frac{z-3}{4}$

3. A line makes an obtuse angle with the positive x-axis and angles $\frac{\pi}{4}$ and $\frac{\pi}{3}$ with the positive y and z-axes respectively. Its direction cosine are

a) $-\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}},\frac{1}{2}$ b) $\frac{1}{\sqrt{2}},-\frac{1}{2},\frac{1}{2}$ c) $-\frac{1}{2},\frac{1}{\sqrt{2}},\frac{1}{2}$ d) $\frac{1}{2},\frac{1}{\sqrt{2}},\frac{1}{2}$

4. If $\vec{\mathbf{a}}$ is a constant vector and p is a real constant with $|\vec{\mathbf{a}}|^2>p$, then the locus of a point with position vector $\vec{\mathbf{r}}$ such that $|\vec{\mathbf{r}}|^2-2\vec{\mathbf{r}}\cdot\vec{\mathbf{a}}+p=0$is

a) A sphere b) An ellipse c) A circle d) A plane

5. The image of the point $P(1,3,4)$ in the plane $2x-y+z+3=0$ is

a) $(3,5,-2)$ b) $(-3,5,2)$ c) $(3,-5,2)$ d) $(-1,4,2)$

6. The distance of the point $(1,-2,3)$ from the planes $x-y+z=5$ measured along the line $\frac{x}{2}=\frac{y}{3}=\frac{z}{-6}$ is

a) 1 b) $\frac{6}{7}$ c) $\frac{7}{6}$ d) None of these

7. The coordinates of the foot of the perpendicular drawn from the point $A(1,0,3)$ to the join of the points $B(4,7,1)$ and $C(3,5,3)$ are

a) $(5/3,7/3,17/3)$ b) $(5,7,17)$ c) $(5/7,-7/3,17/3)$ d) $(-5/3,7/3,-17/3)$

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8. The symmetric equation of lines $3x + 2y + z - 5 = 0$ and $x + y - 2z - 3 = 0$, is

a) $\frac{x-1}{5} = \frac{y-4}{7} = \frac{z-0}{1}$
b) $\frac{x+1}{5} = \frac{y+4}{7} = \frac{z-0}{1}$
c) $\frac{x+1}{-5} = \frac{y-4}{7} = \frac{z-0}{1}$
d) $\frac{x-1}{-5} = \frac{y-4}{7} = \frac{z-0}{1}$

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

a) $\sqrt{b^2 + c^2}$
b) $\sqrt{a^2 + b^2}$
c) $\sqrt{a^2 + c^2}$
d) None of these

10. P, Q, R, S Are four coplanar points on the sides AB, BC, CD, DA of a skew quadrilateral. The product $\frac{AP}{PB} \cdot \frac{BQ}{QC} \cdot \frac{CR}{RD} \cdot \frac{DS}{SA}$ equals

a) -2
b) -1
c) 2
d) 1

11. The shortest distance between the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-2}{3} = \frac{y-4}{4} = \frac{z-5}{5}$, is

a) $1/\sqrt{6}$
b) $1/6$
c) $1/3$
d) $1/\sqrt{3}$

12. A plane $x + y + z = -a\sqrt{3}$ touches the sphere $2x^2 + 2y^2 + 2z^2 - 2x + 4y - 4z + 3 = 0$, then the value of a is

a) $\frac{1}{\sqrt{3}}$
b) $\frac{1}{2\sqrt{3}}$
c) $1 - \frac{1}{\sqrt{3}}$
d) $1 + \frac{1}{\sqrt{3}}$

13. $A(3, 2, 0), B(5, 3, 2)$ and $C(-9, 6, -3)$ are the vertices of a triangle ABC. If the bisector of $\angle ABC$ meets BC at D, then coordinates of D are

a) $(19/8, 57/16, 17/16)$
b) $(-19/8, 57/16, 17/16)$
c) $(19/8, -57/16, 17/16)$
d) None of these

14. The equation of the plane through the line of intersection of planes $ax + by + cz + d = 0, a'x + b'y + c'z + d' = 0$ and parallel to the line $y = 0, z = 0$ is

a) $(ab' - a'b)x + (bc' - b'c)y + (ad' - a'd) = 0$
b) $(ab' - a'b)x + (bc' - b'c)y + (ad' - a'd)z = 0$
c) $(ab' - a'b)y + (ac' - a'c)z + (ad' - a'd) = 0$
d) None of these

15. If P is a point in space such that $\vec{O}P$ is inclined to OX at 45° and OY to 60°, then $\vec{O}P$ is inclined to OZ at

a) 75°
b) 60° or 120°
c) 75° or 105°
d) 255°

16. A variable plane $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$ at a unit distance from origin cuts the coordinate axes at A, B and C.Centriod (x, y, z)satisfies the equation $\frac{1}{x^2} + \frac{1}{y^2} + \frac{1}{z^2} = k$.The value of k is

a) 9
b) 3
c) $\frac{1}{9}$
d) $\frac{1}{3}$

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17. 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) $5x+2y-4z=0$

18. The equation of the plane passing through the points $(0,1,2)$ and $(-1,0,3)$ and perpendicular to the plane $2x+3y+z=5$ is

a) $3x-4y+18z+32=0$ b) $3x+4y-18z+32=0$

c) $4x+3y-17z+31=0$ d) $4x-3y+z+1=0$

19. The shortest distance between the skew lines $l_1:\vec{\mathbf{r}}=\vec{\mathbf{a}}_1+\lambda\vec{\mathbf{b}}_1$ $l_2:\vec{\mathbf{r}}=\vec{\mathbf{a}}_2+\mu\vec{\mathbf{b}}_2$ is

a) $\frac{|\vec{\mathbf{a}}_2-\vec{\mathbf{a}}_1)\cdot\vec{\mathbf{b}}_1\times\vec{\mathbf{b}}_2|}{|\vec{\mathbf{b}}_1\times\vec{\mathbf{b}}_2|}$ b) $\frac{|\vec{\mathbf{a}}_2-\vec{\mathbf{a}}_1)\cdot\vec{\mathbf{a}}_2\times\vec{\mathbf{b}}_2|}{|\vec{\mathbf{b}}_1\times\vec{\mathbf{b}}_2|}$ c) $\frac{|\vec{\mathbf{a}}_2-\vec{\mathbf{b}}_2)\cdot\vec{\mathbf{a}}_1\times\vec{\mathbf{b}}_1|}{|\vec{\mathbf{b}}_1\times\vec{\mathbf{b}}_2|}$ d) $\frac{|\vec{\mathbf{a}}_1-\vec{\mathbf{b}}_2)\cdot\vec{\mathbf{b}}_1\times\vec{\mathbf{a}}_2|}{|\vec{\mathbf{b}}_1\times\vec{\mathbf{a}}_2|}$

20. The perpendicular distance from the origin to the plane through the point $(2,3,-1)$ and perpendicular to the vector $3\hat{\imath}-4\hat{\jmath}+7\hat{k}$

a) $\frac{13}{\sqrt{74}}$ b) $\frac{-13}{\sqrt{74}}$ c) 13 d) None of these

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SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 7**

Topic :- THREE DIMENSIONAL GEOMETRY

1. The lines $\vec{r} = \vec{a} + \lambda(\vec{b} \times \vec{c})$ and $\vec{r} = \vec{b} + \mu(\vec{c} \times \vec{a})$ will intersect, if
   a) $\vec{a} \times \vec{c} = \vec{b} \times \vec{c}$ b) $\vec{a} \cdot \vec{c} = \vec{b} \cdot \vec{c}$ c) $\vec{b} \times \vec{a} = \vec{c} \times \vec{a}$ d) None of these

2. The radius of the circle in which the sphere $x^2 + y^2 + z^2 + 2x - 2y - 4z - 19 = 0$ is cut by the plane $x + 2y + 2z + 7 = 0$ is
   a) 1 b) 2 c) 3 d) 4

3. A line passes through the points $(6, -7, -1)$ and $(2, -3, 1)$. The direction cosines of the line so directed that the angle made by it with the positive direction of x-axis is acute, are
   a) $\frac{2}{3}, -\frac{2}{3}, -\frac{1}{3}$ b) $-\frac{2}{3}, \frac{2}{3}, \frac{1}{3}$ c) $\frac{2}{3}, -\frac{2}{3}, \frac{1}{3}$ d) $\frac{2}{3}, \frac{2}{3}, \frac{1}{3}$

4. If the angle between the line $\frac{x+1}{1} = \frac{y-1}{2} = \frac{z-2}{2}$ and the plane $2x - y + \sqrt{\lambda}z + 4 = 0$ is such thatsin $\theta = \frac{1}{3}$ Then, value of λ is
   a) $-\frac{4}{3}$ b) $\frac{3}{4}$ c) $\frac{-3}{5}$ d) $\frac{5}{3}$

5. The equation of the line passing through the point $(3, 0, -4)$ and perpendicular to the plane $2x - 3y + 5z - 7 = 0$ is
   a) $\frac{x-2}{3} = \frac{y}{-3} = \frac{z+4}{5}$ b) $\frac{x-3}{2} = \frac{y}{-3} = \frac{z-4}{5}$ c) $\frac{x-3}{2} = \frac{-y}{3} = \frac{z+4}{5}$ d) $\frac{x+3}{2} = \frac{y}{3} = \frac{z-4}{5}$

6. If the plane $3x + y + 2z + 6 = 0$ is parallel to the line $\frac{3x-1}{2b} = 3 - y = \frac{z-1}{a}$, then the value of $3a + 3b$ is
   a) $\frac{1}{2}$ b) $\frac{3}{2}$ c) 3 d) 4

7. The equation of the plane which meets the axes in A, B, C such that the triangle ABC is $\left(\frac{1}{3}, \frac{1}{3}, \frac{1}{3}\right)$ is given by
   a) $x + y + z = 1$ b) $x + y + z = 2$ c) $\frac{x}{3} + \frac{y}{3} + \frac{z}{3} = 3$ d) $x + y + z = \frac{1}{3}$

8. The equation to the plane through the points $(2, 3, 1)$ and $(4, -5, 3)$ parallel to x-axis is
   a) $x + y + 4z = 7$ b) $x + 4z = 7$ c) $y - 4z = 7$ d) $y + 4z = -7$

9. The equation of the plane passing through the intersection of the planes $x + 2y + 3z + 4 = 0$ and $4x + 3y + 2z + 1 = 0$ and the origin, is
   a) $3x + 2y + z + 1 = 0$ b) $3x + 2y + z = 0$ c) $2x + 3y + z = 0$ d) $x + y + z = 0$

10. The vector equation of a plane which contains the line $\vec{r} = 2\hat{\imath} + \lambda(\hat{\jmath} - \hat{k})$ and perpendicular to the plane $\vec{r} \cdot (\hat{\imath} + \hat{k}) = 3$, is

a) $\vec{r} \cdot (\hat{\imath} - \hat{\jmath} - \hat{k}) = 2$ b) $\vec{r} \cdot (\hat{\imath} + \hat{\jmath} - \hat{k}) = 2$ c) $\vec{r} \cdot (\hat{\imath} + \hat{\jmath} + \hat{k}) = 2$ d) None of these

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

a) 2 : 3 b) 3 : 2 c) $-2:3$ d) $4:-3$

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

a) $\frac{7}{2}$ b) $\frac{2}{7}$ c) $-\frac{7}{2}$ d) $-\frac{2}{7}$

13. The shortest distance between the lines $\vec{r} = (5\hat{\imath} + 7\hat{\jmath} + 3\hat{k}) + \lambda(5\hat{\imath} - 16\hat{\jmath} + 7\hat{k})$ and, $\vec{r} = 9\hat{\imath} + 13\hat{\jmath} + 15\hat{k} + \mu(3\hat{\imath} + 8\hat{\jmath} - 5\hat{k})$, is

a) 10 units b) 12 units c) 14 units d) None of these

14. A 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) $x + 2y - z = 0$ d) $2x - y + z = 5$

15. The equation of the plane through the point (1, 2,3) and parallel to the plane $x + 2y + 5z = 0$ is

a) $(x - 1) + 2(y - 2) + 5(z - 3) = 0$ b) $x + 2y + 5z = 14$

c) $x + 2y + 5z = 6$ d) None of the above

16. Radius of the circle $\overrightarrow{\mathbf{r}^2} + \vec{\mathbf{r}} \cdot (2\hat{\mathbf{i}} - 2\hat{\mathbf{j}} - 4\hat{\mathbf{k}}) - 19 = 0$ and $\vec{\mathbf{r}} \cdot (\hat{\mathbf{i}} - 2\hat{\mathbf{j}} + 2\hat{\mathbf{k}}) + 8 = 0$

a) 5 b) 4 c) 3 d) 2

17. If P be the point (2, 6, 3), then the equation of the plane through P at right angle to OP, O being the origin, is

a) $2x + 6y + 3z = 7$ b) $2x - 6y + 3z = 7$ c) $2x + 6y - 3z = 49$ d) $2x + 6y + 3z = 49$

18. If the coordinate of the verities of a triangle ABC be $A(-1,3,2)$, $B(2,3,5)$and $C(3,5,-2)$, then $\angle A$ is equal to

a) 45° b) 60° c) 90° d) 30°

19. The position vector of the point in which the line joining the points $\hat{\imath} - 2\hat{\jmath} + \hat{k}$ and $3\hat{k} - 2\hat{\jmath}$ cuts the plane through the origin and the points $4\hat{\jmath}$ and $2\hat{\jmath} + \hat{k}$, is

a) $6\hat{\imath} - 10\hat{\jmath} + 3\hat{k}$ b) $\frac{1}{5}(6\hat{\imath} - 10\hat{\jmath} + 3\hat{k})$ c) $-6\hat{\imath} + 10\hat{\jmath} - 3\hat{k}$ d) None of these

20. The plane of intersection of spheres $x^2 + y^2 + z^2 + 2x + 2y + 2z = 2$ and $2x^2 + 2y^2 + 2z^2 + 4x + 2y + 4z = 0$ is

a) Parallel to xz-plane b) Parallel to y-axis c) $y = 0$ d) None of these

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 8**

Topic :- THREE DIMENSIONAL GEOMETRY

1. The direction cosines of a line equally inclined to three mutually perpendicular lines having direction cosines as $l_1, m_1, n_1; l_2, m_2, n_2; l_3, m_3, n_3$ are
   a) $l_1 + l_2 + l_3, m_1 + m_2 + m_3, n_1 + n_2 + n_3$
   b) $\frac{l_1+l_2+l_3}{\sqrt{3}}, \frac{m_1+m_2+m_3}{\sqrt{3}}, \frac{n_1+n_2+n_3}{\sqrt{3}}$
   c) $\frac{l_1+l_2+l_3}{3}, \frac{m_1+m_2+m_3}{3}, \frac{n_1+n_2+n_3}{3}$
   d) None of these

2. A line makes angles of 45° and 60° with the x-axis and the z-axis respectively. The angle made by it with y-axis is
   a) 30° or 150° b) 60° or 120° c) 45° or 135° d) 90°

3. If the direction cosines of two lines are such that $l + m + n = 0, l^2 + m^2 + n^2 = 0$, then the angle between them is
   a) π b) $\pi/3$ c) $\pi/4$ d) $\pi/6$

4. The value of λ for which the lines $\frac{x-1}{1} = \frac{y-2}{\lambda} = \frac{z+1}{-1}$ and $\frac{x+1}{-\lambda} = \frac{y+1}{2} = \frac{z-2}{1}$ are perpendicular to each other is
   a) 0 b) 1 c) -1 d) None of these

5. In a three dimensional xyz-space, the equation $x^2 - 5x + 6 = 0$ represents
   a) Points b) Plane c) Curves d) Pair of straight lines

6. Angle between the line $\frac{x+1}{1} = \frac{y}{2} = \frac{y-1}{1}$ and a normal to the plane $x - y + z = 0$ is
   a) 0° b) 30° c) 45° d) 90°

7. The angle between the line $\frac{3x-1}{3} = \frac{y+3}{-1} = \frac{5-2z}{4}$ and the plane $3x - 3y - 6z = 10$ is equal to
   a) $\frac{\pi}{6}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{3}$ d) $\frac{\pi}{2}$

8. The foot of the perpendicular drawn from a point with position vector $\hat{\imath} + 4\,\hat{k}$ on the line joining the points having position vectors as $-11\,\hat{\jmath} + 3\,\hat{k}$ and $2\,\hat{\imath} - 3\,\hat{\jmath} + \hat{k}$ has the position vector
   a) $4\,\hat{\imath} + 5\,\hat{\jmath} + 5\,\hat{k}$ b) $4\,\hat{\imath} + 5\,\hat{\jmath} - 5\,\hat{k}$ c) $5\,\hat{\imath} + 4\,\hat{\jmath} - 5\,\hat{k}$ d) $4\,\hat{\imath} - 5\,\hat{\jmath} + 5\,\hat{k}$

9. What are the DR's of vector parallel to $(2,-1,1)$ and $(3,4,-1)$?

a) $(1,5-2)$ b) $(-2,-5,2)$ c) $(-1,5,2)$ d) $(-1,-5,-2)$

10. The point of intersection of the line $\frac{x-1}{3}=\frac{y+2}{4}=\frac{z-3}{-2}$ and plane $2x-y+3z-1=0$ is

a) $(10,-10,3)$ b) $(10,10,-3)$ c) $(-10,10,3)$ d) None of these

11. The equation of the plane containing the line $\frac{x+1}{-3}=\frac{y-3}{2}=\frac{z+2}{1}$ and the point $(0,7,-7)$is

a) $x+y+z=1$ b) $x+y+z=2$ c) $x+y+z=0$ d) None of these

12. Equation of the plane passing through the point $(1, 1, 1)$ and perpendicular to each of the planes $x+2y+3z=7$ and $2x-3y+4z=0$, is

a) $17x-2y+7z=12$ b) $17x+2y-7z=12$ c) $17x+2y+7z=12$ d) $17x-2y-7z=12$

13. The equation of the plane passing through $(1, 1, 1)$ and $(1,-1,-1)$ and perpendicular to $2x-y+z+5=0$ is

a) $2x+5y+z-8=0$ b) $x+y-z-1=0$ c) $2x+5y+z+4=0$ d) $x-y+z-1=0$

14. If $\vec{r}$ is a vector of magnitude 21 and has direction ratios proportional to $2,-3,6$, then $\vec{r}$ is equal to

a) $6\hat{\imath}-9\hat{\jmath}+18\hat{k}$ b) $6\hat{\imath}+9\hat{\jmath}+18\hat{k}$ c) $6\hat{\imath}-9\hat{\jmath}-18\hat{k}$ d) $6\hat{\imath}+9\hat{\jmath}-18\hat{k}$

15. The line perpendicular to the plane $2x-y+5z=4$ passing through the point $(-1,0,1)$ is

a) $\frac{x+1}{2}=y=\frac{z-1}{-5}$ b) $\frac{x+1}{-2}=y=\frac{z-1}{-5}$ c) $\frac{x+1}{2}=-y=\frac{z-1}{5}$ d) $\frac{x+1}{2}=y=\frac{z-1}{5}$

16. The equation of the sphere whose centre is $(6,-1,2)$ and which touches the plane $2x-y+2z-2=0$, is

a) $x^2+y^2+z^2-12x+2y-4z-16=0$ b) $x^2+y^2+z^2-12x+2y-4z=0$

c) $x^2+y^2+z^2-12x+2y-4z+16=0$ d) $x^2+y^2+z^2-12x+2y-4z+6=0$

17. The equation of the plane passing through three non-collinear points with position vectors $\vec{\mathbf{a}},\vec{\mathbf{b}},\vec{\mathbf{c}}$ is

a) $\vec{\mathbf{r}}\cdot(\vec{\mathbf{b}}\times\vec{\mathbf{c}}+\vec{\mathbf{c}}\times\vec{\mathbf{a}}+\vec{\mathbf{a}}\times\vec{\mathbf{b}})=0$ b) $\vec{\mathbf{r}}\cdot(\vec{\mathbf{b}}\times\vec{\mathbf{c}}+\vec{\mathbf{c}}\times\vec{\mathbf{a}}+\vec{\mathbf{a}}\times\vec{\mathbf{b}})=[\vec{\mathbf{a}}\,\vec{\mathbf{b}}\,\vec{\mathbf{c}}]$

c) $\vec{\mathbf{r}}\cdot\left(\vec{\mathbf{a}}\times(\vec{\mathbf{b}}+\vec{\mathbf{c}})\right)=[\vec{\mathbf{a}}\,\vec{\mathbf{b}}\,\vec{\mathbf{c}}]$ d) $\vec{\mathbf{r}}\cdot(\vec{\mathbf{a}}+\vec{\mathbf{b}}+\vec{\mathbf{c}})=0$

18. If the planes $x=cy+bz$, $y=az+cx, z=bx+ay$ pass through a line, then $a^2+b^2+c^2+2abc$ is

a) 0 b) 1 c) 2 d) 3

19. The equation of the plane, which makes with coordinate axes, a triangle with its centroid (α, β, γ)is

a) $\alpha x+\beta y+\gamma z=3$ b) $\alpha x+\beta y+\gamma z=1$ c) $\frac{x}{\alpha}+\frac{y}{\beta}+\frac{z}{\gamma}=3$ d) $\frac{x}{\alpha}+\frac{y}{\beta}+\frac{z}{\gamma}=1$

20. The equation of the plane perpendicular to the line $\frac{x-1}{1}=\frac{y-2}{-1}=\frac{z+1}{2}$ and passing through the point (2, 3, 1), is

a) $\vec{r}\cdot(\hat{\imath}+\hat{\jmath}+2k)=1$ b) $\vec{r}\cdot(\hat{\imath}-\hat{\jmath}+2k)=1$ c) $\vec{r}\cdot(\hat{\imath}-\hat{\jmath}+2k)=7$ d) $\vec{r}\cdot(\hat{\imath}+\hat{\jmath}-2k)=10$

VISHAL SIR'S ACADEMY ACADEMY Learning Without Limits Since 2010 NAGPUR

SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 9**

Topic :- THREE DIMENSIONAL GEOMETRY

1. Equation of a line passing through $(1,-2,3)$ and parallel to the plane $2x+3y+z+5=0$ is
   a) $\frac{x-1}{-1}=\frac{y+2}{1}=\frac{z-3}{-1}$
   b) $\frac{x-1}{2}=\frac{y+2}{3}=\frac{z-3}{1}$
   c) $\frac{x+1}{-1}=\frac{y-2}{1}=\frac{z-3}{-1}$
   d) None of these

2. 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) $3\sqrt{30}$

3. The point in the xy $-$plane which is equidistant from the point (2, 0, 3) and (0, 3, 2) and (0, 0, 1), is
   a) (1, 2, 3) b) $(-3,2,0)$ c) $(3,-2,0)$ d) $(3,2,0)$

4. A sphere of constant radius $2k$ passes through the origin and meets the axes in A, B, C. The locus of the centroid of the tetrahedron ABC is
   a) $x^2+y^2+z^2=4k^2$ b) $x^2+y^2+z^2=k^2$
   c) $2(x^2+y^2+z^2)=k^2$ d) None of these

5. The direction cosines of the line which is perpendicular to the lines whose direction cosines are proportional to
$(1,-1,2)$and $(2,1,-1)$ are
   a) $\frac{-2}{\sqrt{35}},\frac{5}{\sqrt{35}},\frac{3}{\sqrt{35}}$ b) $-\frac{1}{\sqrt{35}},\frac{5}{\sqrt{35}},\frac{3}{\sqrt{35}}$ c) $-\frac{1}{\sqrt{35}},\frac{5}{\sqrt{35}},\frac{3}{\sqrt{35}}$ d) None of these

6. The shortest distance between the lines $1+x=2y=-12z$ and $x=y+2=6z-6$ is
   a) 1 b) 2 c) 3 d) 4

7. The position vectors of points A and B are $\hat{\imath}-\hat{\jmath}+3\hat{k}$ and $3\hat{\imath}+3\hat{\jmath}+3\hat{k}$ respectively. The equation of a plane is $\vec{r}\cdot(5\hat{\imath}+2\hat{\jmath}-7\hat{k})+9=0$. The points A and B
   a) Lie on the plane
   b) Are on the same side of the plane
   c) Are on the opposite side of the plane
   d) None of these

8. The distance of the point $(-1,-5,-10)$ from the point of intersection of the line $\frac{x-2}{3}=\frac{y+1}{4}=\frac{z-2}{12}$ and the plane $x-y+z=5$ is

a) $\frac{14}{5}$ b) 11 c) 13 d) 15

9. The line segment adjoining the points A, B makes projection 1, 4, 3 on x, y, z-axes respectively. Then, the direction cosines of AB are

a) 1, 4, 3 b) $1/\sqrt{26}, 4/\sqrt{26}, 3/\sqrt{26}$

c) $-1/\sqrt{26}, 4/\sqrt{26}, 3/\sqrt{26}$ d) $1/\sqrt{26}, -4/\sqrt{26}, 3/\sqrt{26}$

10. If the direction ratios of two lines are given by $3lm+4ln+mn=0$ and $l+2m+3n=0$, then the angle between the lines is

a) $\pi/2$ b) $\pi/3$ c) $\pi/4$ d) $\pi/6$

11. If $(2,3,5)$ is one end of a diameter of the sphere $x^2+y^2+z^2-6x-12y-2z+20=0$, then the coordinates of the other end of the diameter are

a) $(4,9,-3)$ b) $(4,-3,3)$ c) $(4,3,5)$ d) $(4,3,-3)$

12. If Q is the image of the point $P(2,3,4)$ under the reflection in the plane $x-2y+5z=6$, then the equation of the line PQ is

a) $\frac{x-2}{-1}=\frac{y-3}{2}=\frac{z-4}{5}$ b) $\frac{x-2}{1}=\frac{y-3}{-2}=\frac{z-4}{5}$ c) $\frac{x-2}{-1}=\frac{y-3}{-2}=\frac{z-4}{5}$ d) $\frac{x-2}{1}=\frac{y-3}{2}=\frac{z-4}{5}$

13. There is point $P(a,a,a)$ on the line passing through the origin and equally inclined with axes. The equation of plane perpendicular to OP and passing through P cuts the intercepts on axes. The sum of whose reciprocals is

a) a b) $\frac{3}{2a}$ c) $\frac{3a}{2}$ d) $\frac{1}{a}$

14. If P is a point in space such that $OP=12$ and $\vec{O}P$ is inclined at angles of 45° and 60° with OX and OY respectively, then the position vector of P is

a) $6\hat{\imath}+6\hat{\jmath}\pm 6\sqrt{2}\,\hat{k}$ b) $6\hat{\imath}+6\sqrt{2}\hat{\jmath}\pm 6\,\hat{k}$ c) $6\sqrt{2}\hat{\jmath}+6\hat{\jmath}\pm 6\,\hat{k}$ d) None of these

15. Equation of plane containing the lines

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

And $\vec{\mathbf{r}}=\hat{\mathbf{i}}+2\hat{\mathbf{j}}+\hat{\mathbf{k}}+\mu(\hat{\mathbf{i}}+2\hat{\mathbf{j}}+2\hat{\mathbf{k}})$ is

a) $\vec{\mathbf{r}}=\hat{\mathbf{i}}+2\hat{\mathbf{j}}+\hat{\mathbf{k}}+\lambda(\hat{\mathbf{i}}+\hat{\mathbf{j}}+2\hat{\mathbf{k}})$ b) $\vec{\mathbf{r}}=\hat{\mathbf{i}}+\hat{\mathbf{j}}+\hat{\mathbf{k}}+\lambda(\hat{\mathbf{i}}+2\hat{\mathbf{j}}+\hat{\mathbf{k}})+\mu(\hat{\mathbf{i}}+2\hat{\mathbf{j}}+\hat{\mathbf{k}})$

c) $\vec{\mathbf{r}}=\hat{\mathbf{i}}+2\hat{\mathbf{j}}+2\hat{\mathbf{k}}+\lambda(\hat{\mathbf{i}}+\hat{\mathbf{j}}+\hat{\mathbf{k}})+\mu(\hat{\mathbf{i}}+2\hat{\mathbf{j}}+\hat{\mathbf{k}})$ d) $\vec{\mathbf{r}}=\hat{\mathbf{i}}+2\hat{\mathbf{j}}+\hat{\mathbf{k}}+\lambda(\hat{\mathbf{i}}+\hat{\mathbf{j}}+\hat{\mathbf{k}})+\mu(\hat{\mathbf{i}}+2\hat{\mathbf{j}}+2\hat{\mathbf{k}})$

16. Cosine of the angle between two diagonals of cube is equal to

a) $\frac{2}{\sqrt{6}}$ b) $\frac{1}{3}$ c) $\frac{1}{2}$ d) None of these

17. The equation of the plane which bisects the line joining (2, 3, 4) and (6, 7, 8) is

a) $x-y-z-15=0$ b) $x-y+z-15=0$ c) $x+y+z-15=0$ d) $x+y+z+15=0$

18. The distance of the point (3, 8, 2)from the line $\frac{x-1}{2}=\frac{y-3}{4}=\frac{z-2}{3}$ measured parallel to the plane $3x+2y-2z=0$ is

a) 2 b) 3 c) 6 d) 7

19. The direction cosines l, m, n of two lines are connected by the relations $l+m+n=0, lm=0$, then the angle between them is

a) π/3 b) π/4 c) π/2 d) 0

20. If a line lies in the octant $OXYZ$ and it makes equal angles with the axes, then

a) $l=m=n=\frac{1}{\sqrt{3}}$ b) $l=m=n\pm\frac{1}{\sqrt{3}}$ c) $l=m=n=-\frac{1}{\sqrt{3}}$ d) $l=m=n=\pm\frac{1}{\sqrt{3}}$

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SESSION : 2025-26

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 10**

Topic :- THREE DIMENSIONAL GEOMETRY

1. The line joining the points (1, 1, 2) and $(3, -2, 1)$ meets the plane $3x + 2y + z = 6$ at the point
   a) (1, 1, 2) b) $(3, -2, 1)$ c) $(2, -3, 1)$ d) (3, 2, 1)

2. The points $A(5, -1,1), B(7, -4,7), C(1, -6,10)$ and $D(-1, -3, 4)$ are vertices of a
   a) Square b) Rhombus c) Rectangle d) None of these

3. If $P(x, y, z)$ is a point on the line segment joining $Q(2,24)$ and $R(3,5,6)$ such that the projections of OP on the axes are $\frac{13}{5}, \frac{19}{5}$ and $\frac{26}{5}$ respectively, then P divides QR in the ratio
   a) 1:2
   b) 3:2
   c) 2:3
   d) 1:3

4. If direction cosines of two lines are proportional to $(2,3-6)$and $(3, -4,5)$ then the acute angle between then is
   a) $\cos^{-1}\left(\frac{49}{36}\right)$ b) $\cos^{-1}\left(\frac{18\sqrt{2}}{35}\right)$ c) 96° d) $\cos^{-1}\left(\frac{18}{35}\right)$

5. The cartesian equation of the plane $\vec{r} = (s - 2t)\hat{\imath} + (3 - t)\hat{\jmath} + (2s + t)\hat{k}$, is
   a) $2x - 5y - z - 15 = 0$
   b) $2x - 5y + z - 15 = 0$
   c) $2x - 5y - z + 15 = 0$
   d) $2x + 5y - z + 15 = 0$

6. The plane $2x - 2y + z + 12 = 0$ touches the sphere $x^2 + y^2 + z^2 - 2x - 4y + 2z - 3 = 0$ at the point
   a) $(1, -4, -2)$ b) $(-1, 4, -2)$ c) $(-1, -4, 2)$ d) $(1, 4, -2)$

7. If θ is the angle between the planes $2x - y + z - 1 = 10$ and $x - 2y + z + 2 = 0$ Then $\cos\theta$ is equal to
   a) 2/3 b) 3/4 c) 4/5 d) 5/6

8. Let $(3, 4, -1)$ and $(-1, 2,3)$ are the end points of a diameter of sphere. Then, the radius of the sphere is equal to
   a) 1 b) 2 c) 3 d) 9

9. Let $A(4,7,8), B(2,3,4)$ and $C(2,5,7)$ be the position vectors of the vertices of a $\Delta\, ABC$. The length of the internal bisector of the angle of A is

a) $\frac{3}{2}\sqrt{34}$ b) $\frac{2}{3}\sqrt{34}$ c) $\frac{1}{2}\sqrt{34}$ d) $\frac{1}{3}\sqrt{34}$

10. The distance of the plane $6x-3y+2z-14=0$ from the origin is

a) 2 b) 1 c) 14 d) 8

11. In ΔABC and mid points of the sides AB, BC and CA are respectively (1,0,0), $(0,m,0)$ and $(0,0,n)$ Then,

$\frac{AB^2+BC^2+CA^2}{(l^2+m^2+n^2)}$ is equal to

a) 2 b) 4 c) 8 d) 16

12. The angle between the straight line $\frac{x+1}{2}=\frac{y-2}{5}=\frac{z+3}{4}$ and $\frac{x-1}{1}=\frac{y+2}{2}=\frac{z-3}{-3}$ is

a) 45° b) 30° c) 60° d) 90°

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

a) 0 b) 1 c) $\sqrt{2}$ d) $2\sqrt{2}$

14. The line through $\hat{\imath}+3\hat{\jmath}+2\hat{k}$ and perpendicular to the lines $\vec{r}=(\hat{\imath}+2\hat{\jmath}-\hat{k})+\lambda(2\hat{\imath}+\hat{\jmath}+\hat{k})$ and, $\vec{r}=(2\hat{\imath}+6\hat{\jmath}+\hat{k})+\mu(\hat{\imath}+2\hat{\jmath}+3\hat{k})$ is

a) $\vec{r}=(\hat{\imath}+2\hat{\jmath}-\hat{k})+\lambda(-\hat{\imath}+5\hat{\jmath}-3\hat{k})$

b) $\vec{r}=\hat{\imath}+3\hat{\jmath}+2\hat{k}+\lambda(\hat{\imath}-5\hat{\jmath}+3\hat{k})$

c) $\vec{r}=\hat{\imath}+3\hat{\jmath}+2\hat{k}+\lambda(\hat{\imath}+5\hat{\jmath}+3\hat{k})$

d) $\vec{r}=\hat{\imath}+3\hat{\jmath}+2\hat{k}+\lambda(-\hat{\imath}-5\hat{\jmath}-3\hat{k})$

15. Let O be the origin and P be the point at a distance 3 units from origin. If direction ratios of OP are $(1,-2,-2)$, then coordinates of P is given by

a) $(1,-2,-2)$ b) $(3,-6,-6)$ c) $(1/3,-2/3,-2/3)$ d) $(1/9,-2/9,-2/9)$

16. The direction cosines l,m,n of two lines are connected by the relation $l+m+n=0$, $lm=0$, then the angles between them is

a) $\pi/3$ b) $\pi/4$ c) $\pi/2$ d) 0

17. Equation of plane containing the line $\frac{x-x_1}{a_1}=\frac{y-y_1}{b_1}=\frac{z-z_1}{c_1}$ and parallel to the line $\frac{x-x_2}{a_2}=\frac{y-y_2}{b_2}=\frac{z-z_2}{c_2}$ is

a) $\begin{vmatrix} x-x_1 & y-y_1 & z-z_1 \\ a_1 & b_1 & c_1 \\ x_2 & y_2 & z_2 \end{vmatrix}=0$

b) $\begin{vmatrix} x-x_2 & y-y_2 & z-z_2 \\ a_2 & b_2 & c_2 \\ x_1 & y_1 & z_1 \end{vmatrix}=0$

c) $\begin{vmatrix} x-x_1 & y-y_1 & z-z_1 \\ a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \end{vmatrix}=0$

d) None of the above

18. The plane $2x-(1+\lambda)y+3z=0$ passes through the intersection of the planes

a) $2x-y=0$ and $y+3z=0$
b) $2x-y=0$ and $y-3z=0$
c) $2x+3z=0$ and $y=0$
d) None of the above

19. The radius of the sphere $x^2+y^2+z^2=x+2y+3z$ is

a) $\frac{\sqrt{14}}{2}$
b) $\sqrt{7}$
c) $\frac{7}{2}$
d) $\frac{\sqrt{7}}{2}$

20. If a plane meets the coordinate axes at A, B and C in such a way that the centroid of ΔABC is at the point (1, 2, 3) the equation of the plane is

a) $\frac{x}{1}+\frac{y}{2}+\frac{z}{3}=1$
b) $\frac{x}{3}+\frac{y}{6}+\frac{z}{9}=1$
c) $\frac{x}{1}+\frac{y}{2}+\frac{z}{3}=\frac{1}{3}$
d) None of these

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