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 $\vec{r}\cdot\left(2\hat{\imath}-\lambda\hat{\jmath}+3\hat{k}\right)=0$ and $\vec{r}\cdot\left(\lambda\hat{\imath}+5\hat{\jmath}-\hat{k}\right)=5$ 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 $\vec{r} \cdot (3\hat{\imath} - \hat{\jmath} + \hat{k}) = 1$ and $\vec{r} \cdot (\hat{\imath} + 4\hat{\jmath} - 2\hat{k}) = 2$ 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) $2\hat{\imath} + 7\hat{\jmath} + 13\hat{k}$