3D

1. The distance of the point $B(\mathbf{i}+2\mathbf{j}+3\mathbf{k})$ from the line which is passing through $A(4\mathbf{i}+2\mathbf{j}+2\mathbf{k})$ and which is parallel to the vector $\vec{C}=2\mathbf{i}+3\mathbf{j}+6\mathbf{k}$ is

(a) 10 (b) $\sqrt{10}$ (c) 100 (d) None of these

2. Let the points *P, Q* and *R* have position vectors $\mathbf{r}_1=3\mathbf{i}-2\mathbf{j}-\mathbf{k}$; $\mathbf{r}_2=\mathbf{i}+3\mathbf{j}+4\mathbf{k}$ and $\mathbf{r}_3=2\mathbf{i}+\mathbf{j}-2\mathbf{k}$ relative to an origin *O*. The distance of *P* from the plane *OQR* is

(a) 2 (b) 3 (c) 1 (d) 5

3. 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

4. The equation of straight line passing through the point (a,b,c) and parallel to *z*-axis, is

(a) $\frac{x-a}{1}=\frac{y-b}{1}=\frac{z-c}{0}$ (b) $\frac{x-a}{0}=\frac{y-b}{1}=\frac{z-c}{1}$ (c) $\frac{x-a}{1}=\frac{y-b}{0}=\frac{z-c}{0}$ (d) $\frac{x-a}{0}=\frac{y-b}{0}=\frac{z-c}{1}$

5. Equation of *x*-axis is

(a) $\frac{x}{1}=\frac{y}{1}=\frac{z}{1}$ (b) $\frac{x}{0}=\frac{y}{1}=\frac{z}{1}$ (c) $\frac{x}{1}=\frac{y}{0}=\frac{z}{0}$ (d) $\frac{x}{0}=\frac{y}{0}=\frac{z}{1}$

6. If the coordinates of the points *P*, *Q*, *R*, *S* be (1, 2, 3), (4, 5, 7), (–4, 3, –6) and (2, 0, 2) respectively, then

(a) $PQ \parallel RS$ (b) $PQ \perp RS$ (c) $PQ = RS$ (d) None of these

7. If the coordinates of the points *A, B, C, D* be (1, 2, 3), (4, 5, 7), (–4, 3, –6) and (2, 9, 2) respectively, then the angle between the lines *AB* and *CD* is

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{3}$ (d) None of these

8. If the direction ratios of a line are 1, –3, 2, then the direction cosines of the line are

(a) $\frac{1}{\sqrt{14}},\frac{-3}{\sqrt{14}},\frac{2}{\sqrt{14}}$ (b) $\frac{1}{\sqrt{14}},\frac{2}{\sqrt{14}},\frac{3}{\sqrt{14}}$ (c) $\frac{-1}{\sqrt{14}},\frac{3}{\sqrt{14}},\frac{-2}{\sqrt{14}}$ (d) $\frac{-1}{\sqrt{14}},\frac{-2}{\sqrt{14}},\frac{-3}{\sqrt{14}}$

9. If a line make α,β,γ with the positive direction of *x, y* and *z*-axis respectively. Then $\cos^2\alpha+\cos^2\beta+\cos^2\gamma$ is

(a) 1/2 (b) –1/2 (c) –1 (d) 1

10. The direction-cosines of the line joining the points (4, 3, –5) and (–2, 1, –8) are

(a) $\left(\frac{6}{7},\frac{2}{7},\frac{3}{7}\right)$ (b) $\left(\frac{2}{7},\frac{3}{7},\frac{6}{7}\right)$ (c) $\left(\frac{6}{7},\frac{3}{7},\frac{2}{7}\right)$ (d) None of these

11. 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) $x^2+y^2+z^2\pm 2ax\pm 2ay\pm 2az+2a^2=0$

12. Equation $ax^2+by^2+cz^2+2fyz+2gzx+2hxy+2ux+2vy+2wz+d=0$ represent, a sphere, if

(a) $a=b=c$ (b) $f=g=h=0$

(c) $v=u=w$ (d) $a=b=c$ and $f=g=h=0$

13. If a plane cuts off intercepts $OA=a,\ OB=b,\ OC=c$ from the coordinate axes, then the area of the triangle *ABC* =

(a) $\frac{1}{2}\sqrt{b^2c^2+c^2a^2+a^2b^2}$ (b) $\frac{1}{2}(bc+ca+ab)$

(c) $\frac{1}{2}abc$ (d) $\frac{1}{2}\sqrt{(b-c)^2+(c-a)^2+(a-b)^2}$

14. 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) $\sqrt{29}$ (b) $\sqrt{41}$ (c) $\sqrt{61}$ (d) None of these

15. The volume of the tetrahedron included between the plane $2x-3y+4z-12=0$ and the three coordinate planes is

(a) $3\sqrt{(29)}$ (b) $6\sqrt{(29)}$ (c) 12 (d) None of these