Single Correct Answer Type:

1. If the sum of the squares of the distances of a point from the three coordinate axes be 36, then its distance from the origin is

(A) 6 (B) $3\sqrt{2}$ (C) $2\sqrt{3}$ (D) $6\sqrt{2}$

2. The locus of a point P which moves such that $PA^2 - PB^2 = 2k^2$ where A and B are $(3,4,5)$ and $(-1,3,-7)$ respectively is

(A) $8x+2y+24z-9+2k^2=0$ (B) $8x+2y+24z-2k^2=0$

(C) $8x+2y+24z+9+2k^2=0$ (D) None of these

3. The coordinates of the points A, B, C, D are $(4,\alpha,2)$, $(5,-3,2)$, $(\beta,1,1)$ & $(3,3,-1)$. Line AB would be perpendicular to line CD when

(A) $\alpha=-1,\beta=-1$ (B) $\alpha=1,\beta=2$ (C) $\alpha=2,\beta=1$ (D) $\alpha=2,\beta=2$

4. A variable plane passes through a fixed point $(1,2,3)$. The locus of the foot of the perpendicular drawn from origin to this plane is

(A) $x^2+y^2+z^2-x-2y-3z=0$ (B) $x^2+2y^2+3z^2-x-2y-3z=0$

(C) $x^2+4y^2+9z^2+x+2y+3=0$ (D) $x^2+y^2+z^2+x+2y+3z=0$

5. If plane cuts off intercepts OA = a, OB = b, OC = c from the coordinate axes, then the area of the triangle ABC equal to

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

6. Two systems of rectangular axes have same origin. If a plane cuts them at distances a, b, c and a_1,b_1,c_1 from the origin, then

(A) $\frac{1}{a^2}+\frac{1}{b^2}+\frac{1}{c^2}=\frac{1}{a_1^2}+\frac{1}{b_1^2}+\frac{1}{c_1^2}$ (B) $\frac{1}{a^2}-\frac{1}{b^2}+\frac{1}{c^2}=\frac{1}{a_1^2}-\frac{1}{b_1^2}+\frac{1}{c_1^2}$

(C) $a^2+b^2+c^2=a_1^2+b_1^2+c_1^2$ (D) $a^2-b^2+c^2=a_1^2+b_1^2+c_1^2$

7. The direction ratios of a normal to the plane through $(1,0,0)$, $(0,1,0)$, which makes an angle of $\pi/4$ with the plane $x+y=3$ are

(A) $(1,\sqrt{2},1)$ (B) $(1,1,\sqrt{2})$ (C) $(1,1,2)$ (D) $(\sqrt{2},1,1)$

8. Let the points $A(a,b,c)$ and $B(a',b',c')$ be at distances r and r' from origin. The line AB passes through origin when

(A) $\frac{a'}{a}=\frac{b'}{b}=\frac{c'}{c}$ (B) $aa'+bb'+cc'=rr'$

(C) $aa'+bb'+cc'=r^2+r'^2$ (D) None of these

9. If the angle θ 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 that $\sin\theta=\frac{1}{3}$. The value of λ is

(A) $-\frac{4}{3}$ (B) $\frac{3}{4}$ (C) $-\frac{3}{5}$ (D) $\frac{5}{3}$

10. The equation of plane which meet the co-ordinate axes whose centroid is (a,b,c)

(A) $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=1$ (B) $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=0$ (C) $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=3$ (D) $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=\frac{1}{3}$

11. The direction cosines of a line equally inclined to three mutually perpendicular lines having D.C.'s as ℓ_1,m_1,n_1; ℓ_2,m_2,n_2; ℓ_3,m_3,n_3 are

(A) $\ell_1+\ell_2+\ell_3,\ m_1+m_2+m_3,\ n_1+n_2+n_3$

(B) $\frac{\ell_1+\ell_2+\ell_3}{\sqrt{3}},\frac{m_1+m_2+m_3}{\sqrt{3}},\frac{n_1+n_2+n_3}{\sqrt{3}}$

(C) $\frac{\ell_1+\ell_2+\ell_3}{3},\frac{m_1+m_2+m_3}{3},\frac{n_1+n_2+n_3}{3}$

(D) None of these

12. The square of the perpendicular distance of point $P(p,q,r)$ from a line through $A(a,b,c)$ and whose direction cosine are ℓ, m, n is

(A) $\sum\{(q-b)n-(r-c)\}^2$

(B) $\sum\{(q+b)n-(r+c)m\}^2$

(C) $\sum\{(q-b)n+(r-c)m\}^2$

(D) None of these

13. The three lines drawn from O with direction ratios $[1,-1,k],[2,-3,0]$ and $[1,0,3]$ are coplanar. Then $k=$

(A) 1 (B) 0 (C) no such k exists (D) None of these

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

(A) parallel (B) skew (C) intersecting (D) coincident

15. For the line $l:\frac{x-1}{3}=\frac{y+1}{2}=\frac{z-3}{-1}$ and plane $P: x-2y-z=0$; of the following assertions, the one/s which is/are true

(A) l lies on P

(B) l is parallel to P

(C) l is perpendicular to P

(D) None of these

16. 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) $2x-y-z=0$

17. The length of projection of the segment joining (x_1,y_1,z_1) and (x_2,y_2,z_2) on the line $\frac{x-\alpha}{l}=\frac{y-\beta}{m}=\frac{z-\gamma}{n}$ 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

18. The equation of the plane through the point $(-1,2,0)$ and parallel to the lines $\frac{x}{3}=\frac{y+1}{0}=\frac{z-2}{-1}$ and $\frac{x-1}{1}=\frac{2y+1}{2}=\frac{z+1}{-1}$ is

(A) $2x+3y+6z-4=0$ (B) $x-2y+3z+5=0$ (C) $x+y-3z+1=0$ (D) $x+y+3z=1$

19. The equation of the right bisecting plane of the segment joining the points (a,a,a) and $(-a,-a,-a)$; $a \neq 0$ is

(A) $x+y+z=a$ (B) $x+y+z=3a$ (C) $x+y+z=0$ (D) $x+y+z+a=0$

20. If the points $(0,-1,-2)$; $(-3,-4,-5)$; $(-6,-7,-8)$ and (x,x,x) are non-coplanar then $x =$

(A) any real number (B) – 1 (C) 1 (D) 0

Numerical Based:

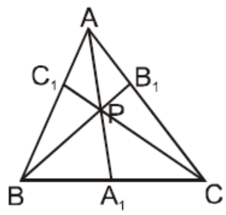
21. The distance of the plane through $(1,1,1)$ and perpendicular to the line $\frac{x-1}{3}=\frac{y-1}{0}=\frac{z-1}{4}$ from the origin is

22. If a point moves so that the sum of the squares of its distance from the six faces of a cube having length of each edge 2 units is 46 units, then the distance of the point from $(1,1,1)$ is

23. If the line joining the origin and the point $(-2,1,2)$ makes angle θ_1, θ_2 and θ_3 with the positive direction of the coordinate axes, then the value of $\cos 2\theta_1+\cos 2\theta_2+\cos 2\theta_3$ is

24. 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

25. In the adjacent figure 'P' is any arbitrary interior point of the triangle ABC such that the lines AA_1, BB_1, CC_1 are concurrent at P. Value of $\frac{PA_1}{AA_1}+\frac{PB_1}{BB_1}+\frac{PC_1}{CC_1}$ is always equal to



KEY

1.	B	2.	C	3.	A	4.	A	5.	A
6.	A	7.	B	8.	A	9.	D	10.	C
11.	B	12.	A	13.	A	14.	D	15.	A
16.	C	17.	A	18.	D	19.	C	20.	A
21.	7	22.	1.4	23.	1	24.	13	25.	1

❇ *Wish You all the Best* ❇