EXERCISE – II MULTIPLE CORRECT (OBJECTIVE QUESTIONS)

1. Equation of the plane passing through $A(x_1, y_1, z_1)$ and containing the line $\frac{x-x_2}{d_1} = \frac{y-y_2}{d_2} = \frac{z-z_2}{d_3}$ is

(A) $\begin{vmatrix} x-x_1 & y-y_1 & z-z_1 \\ x_2-x_1 & y_2-y_1 & z_2-z_1 \\ d_1 & d_2 & d_3 \end{vmatrix} = 0$

(B) $\begin{vmatrix} x-x_2 & y-y_2 & z-z_2 \\ x_1-x_2 & y_1-y_2 & z_1-z_2 \\ d_1 & d_2 & d_3 \end{vmatrix} = 0$

(C) $\begin{vmatrix} x-d_1 & y-d_2 & z-d_3 \\ x_1 & y_1 & z_1 \\ x_2 & y_2 & z_2 \end{vmatrix} = 0$

(D) $\begin{vmatrix} x & y & z \\ x_1-x_2 & y_1-y_2 & z_1-z_2 \\ d_1 & d_2 & d_3 \end{vmatrix} = 0$

2. The equation of the line
$x + y + z - 1 = 0$, $4x + y - 2z + 2 = 0$ written in the symmetrical form is

(A) $\frac{x+1}{1} = \frac{y-2}{-2} = \frac{z-0}{1}$ (B) $\frac{x}{1} = \frac{y}{-2} = \frac{z}{1}$

(C) $\frac{x+1/2}{1} = \frac{y-1}{-2} = \frac{z-1/2}{1}$ (D) $\frac{x-1}{2} = \frac{y+2}{-1} = \frac{z-2}{2}$

3. The acute angle that the vector $2\hat{i} - 2\hat{j} + \hat{k}$ makes with the plane contained by the two vectors $2\hat{i} + 3\hat{j} - \hat{k}$ and $\hat{i} - \hat{j} + 2\hat{k}$ is given by

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

(C) $\tan^{-1}\left(\sqrt{2}\right)$ (D) $\cot^{-1}\left(\sqrt{2}\right)$

4. The ratio in which the sphere $x^2 + y^2 + z^2 = 504$ divides the line joining the points (12, –4, 8) and (27, –9, 18) is

(A) 2 : 3 internally (B) 3 : 4 internally
(C) 2 : 3 externally (D) 3 : 4 externally

5. The equations of the planes through the origin which are parallel to the line $\frac{x-1}{2} = \frac{y+3}{-1} = \frac{z+1}{-2}$ and distance $\frac{5}{3}$ from it are

(A) $2x + 2y + z = 0$ (B) $x + 2y + 2z = 0$
(C) $2x - 2y + z = 0$ (D) $x - 2y + 2z = 0$

6. If the edges of a rectangular parallelopiped are 3, 2, 1 then the angle between a pair of diagonals is given by

(A) $\cos^{-1}\frac{6}{7}$ (B) $\cos^{-1}\frac{3}{7}$ (C) $\cos^{-1}\frac{2}{7}$ (D) None of these

7. Consider the lines $\frac{x}{2} = \frac{y}{3} = \frac{z}{5}$ and $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ the equation of the line which

(A) bisects the angle between the lines is $\frac{x}{3} = \frac{y}{3} = \frac{z}{8}$

(B) bisects the angle between the lines is $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$

(C) passes through origin and is perpendicular to the given lines is $x = y = -z$

(D) None of these

8. The direction cosines of the lines bisecting the angle between the lines whose direction cosines are ℓ_1, m_1, n_1 and ℓ_2, m_2, n_2 and the angle between these lines is θ, are

(A) $\frac{\ell_1+\ell_2}{\cos\frac{\theta}{2}}, \frac{m_1+m_2}{\cos\frac{\theta}{2}}, \frac{n_1+n_2}{\cos\frac{\theta}{2}}$

(B) $\frac{\ell_1+\ell_2}{2\cos\frac{\theta}{2}}, \frac{m_1+m_2}{2\cos\frac{\theta}{2}}, \frac{n_1+n_2}{2\cos\frac{\theta}{2}}$

(C) $\frac{\ell_1+\ell_2}{\sin\frac{\theta}{2}}, \frac{m_1+m_2}{\sin\frac{\theta}{2}}, \frac{n_1+n_2}{\sin\frac{\theta}{2}}$

(D) $\frac{\ell_1+\ell_2}{2\sin\frac{\theta}{2}}, \frac{m_1+m_2}{2\sin\frac{\theta}{2}}, \frac{n_1+n_2}{2\sin\frac{\theta}{2}}$

9. The equation of line AB is $\frac{x}{2}=\frac{y}{-3}=\frac{z}{6}$. Through a point P(1, 2, 5), line PN is drawn perpendicular to AB and line PQ is drawn parallel to the plane 3x + 4y + 5z = 0 to meet AB is Q. Then

(A) co-ordinate of N is $\left(\frac{52}{49},-\frac{78}{49},\frac{156}{49}\right)$

(B) the equation of PN is $\frac{x-1}{3}=\frac{y-2}{-176}=\frac{z-5}{-89}$

(C) the co-ordinates of Q is $\left(3,-\frac{9}{2},9\right)$

(D) the equation of PQ is $\frac{x-1}{4}=\frac{y-2}{-13}=\frac{z-5}{8}$

10. The planes 2x − 3y − 7z = 0, 3x − 14y − 13z = 0 and 8x − 31y − 33z = 0

(A) pass through origin (B) intersect in a common line

(C) form a triangular prism (D) None of these

11. If the length of perpendicular drawn from origin on a plane is 7 units and its direction ratios are −3, 2, 6, then that plane is

(A) −3x + 2y + 6z − 7=0 (B) −3x + 2y + 6z − 49=0

(C) 3x − 2y − 6z − 49=0 (D) −3x + 2y − 6z − 49=0

12. Let a perpendicular PQ be drawn from P(5, 7, 3) to the line $\frac{x-15}{3}=\frac{y-2}{8}=\frac{z-6}{-5}$ when Q is the foot. Then

(A) Q is (9, 13, −15) (B) PQ = 14

(C) the equation of plane containing PQ and the given line is 9x − 4y − z − 14 = 0

(D) None of these