1. The distance of the point (1, –5, 9) from the plane $x - y + z = 5$ measured along a straight line $x = y = z$ is : **[AIEEE-2011]**

(1) $3\sqrt{5}$ (2) $10\sqrt{3}$

(3) $5\sqrt{3}$ (4) $3\sqrt{10}$

2. An equation of a plane parallel to the plane $x - 2y + 2z - 5 = 0$ and at a unit distance from the origin is : **[AIEEE-2012]**

(1) $x - 2y + 2z + 5 = 0$

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

(3) $x - 2y + 2z + 1 = 0$

(4) $x - 2y + 2z - 1 = 0$

3. If the lines $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-1}{4}$ and $\frac{x-3}{1} = \frac{y-k}{2} = \frac{z}{1}$ intersect, then k is equal to: **[AIEEE-2012]**

(1) 0 (2) – 1 (3) $\frac{2}{9}$ (4) $\frac{9}{2}$

4. The equation of a plane containing the line $\frac{x+1}{-3} = \frac{y-3}{2} = \frac{z+2}{1}$ and the point (0, 7, –7) is: **[AIEEE-2012 (Online)]**

(1) $x + 2y - z = 21$

(2) $x + y + z = 0$

(3) $3x - 2y + 3z + 35 = 0$

(4) $3x + 2y + 5z + 21 = 0$

5. Consider the following planes :

P : $x + y - 2z + 7 = 0$

Q : $x + y + 2z + 2 = 0$

R : $3x + 3y - 6z - 11 = 0$ **[AIEEE-2012 (Online)]**

(1) P and R are perpendicular

(2) P and Q are parallel

(3) P and R are parallel

(4) Q and R are perpendicular

6. The distance of the point $-\hat{i} + 2\hat{j} + 6\hat{k}$ from the straight line that passes through the point $2\hat{i} + 3\hat{j} - 4\hat{k}$ and is parallel to the vector $6\hat{i} + 3\hat{j} - 4\hat{k}$ is : **[AIEEE-2012 (Online)]**

(1) 8 (2) 7

(3) 10 (4) 9

7. A line with positive direction cosines passes through the point P(2, –1, 2) and makes equal angles with the coordinate axes. If the line meets the plane $2x + y + z = 9$ at point Q, then the length PQ equals **[AIEEE-2012 (Online)]**

(1) 2 (2) $\sqrt{3}$

(3) 1 (4) $\sqrt{2}$

8. The values of a for which the two points (1, a, 1) and (–3, 0, a) lie on the opposite sides of the plane $3x + 4y - 12z + 13 = 0$, satisfy :- **[AIEEE-2012 (Online)]**

(1) $0 < a < 1/3$

(2) $a = 0$

(3) $-1 < a < 0$

(4) $a < -1$ or $a > 1/3$

9. If the three planes $x = 5$, $2x - 5ay + 3z - 2 = 0$ and $3bx + y - 3z = 0$ contain a common line, then (a, b) is equal to :- **[AIEEE-2012 (Online)]**

(1) $\left(-\frac{1}{5}, \frac{8}{15}\right)$ (2) $\left(-\frac{8}{15}, \frac{1}{5}\right)$

(3) $\left(\frac{1}{5}, -\frac{8}{15}\right)$ (4) $\left(\frac{8}{15}, -\frac{1}{5}\right)$

10. The coordinates of the foot of perpendicular from the point (1, 0, 0) to the line $\frac{x-1}{2} = \frac{y+1}{-3} = \frac{z+10}{8}$ are :- **[AIEEE-2012 (Online)]**

(1) (5, –8, –4) (2) (2, –3, 8)

(3) (3, –4, –2) (4) (1, –1, –10)

11. Distance between two parallel planes $2x + y + 2z = 8$ and $4x + 2y + 4z + 5 = 0$ is :- **[JEE (Main)-2013]**

(1) $\frac{3}{2}$ (2) $\frac{5}{2}$

(3) $\frac{7}{2}$ (4) $\frac{9}{2}$

12. If the lines $\frac{x-2}{1}=\frac{y-3}{1}=\frac{z-4}{-k}$ and $\frac{x-1}{k}=\frac{y-4}{2}=\frac{z-5}{1}$ are coplanar, then k can have : **[JEE (Main)-2013]**

(1) any value

(2) exactly one value

(3) exactly two values

(4) exactly three values.

13. The image of the line $\frac{x-1}{3}=\frac{y-3}{1}=\frac{z-4}{-5}$ in the plane $2x - y + z + 3 = 0$ is the line : **[JEE (Main)-2014]**

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

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

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

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

14. The angle between the lines whose direction cosines satisfy the equations $\ell + m + n = 0$ and $\ell^2 = m^2 + n^2$ is : **[JEE (Main)-2014]**

(1) $\frac{\pi}{3}$ (2) $\frac{\pi}{4}$

(3) $\frac{\pi}{6}$ (4) $\frac{\pi}{2}$

15. The equation of the plane containing the line $2x - 5y + z = 3$; $x + y + 4z = 5$, and parallel to the plane, $x + 3y + 6z = 1$, is **[JEE (Main)-2015]**

(1) $x + 3y + 6z = 7$

(2) $2x + 6y + 12z = -13$

(3) $2x + 6y + 12z = 13$

(4) $x + 3y + 6z = -7$

16. The distance of the point (1, 0, 2) from the point of intersection of the line $\frac{x-2}{3}=\frac{y+1}{4}=\frac{z-2}{12}$ and the plane $x - y + z = 16$, is : **[JEE (Main)-2015]**

(1) $3\sqrt{21}$ (2) 13

(3) $2\sqrt{14}$ (4) 8

17. The distance of the point (1, –5, 9) from the plane $x - y + z = 5$ measured along the line $x = y = z$ is : **[JEE (Main)-2016]**

(1) $\frac{20}{3}$ (2) $3\sqrt{10}$

(3) $10\sqrt{3}$ (4) $\frac{10}{\sqrt{3}}$

18. If the line, $\frac{x-3}{2}=\frac{y+2}{-1}=\frac{z+4}{3}$ lies in the plane, $lx + my - z = 9$, then $\ell^2 + m^2$ is equal to :- **[JEE (Main)-2016]**

(1) 2 (2) 26

(3) 18 (4) 5

19. If the image of the point P(1, –2, 3) in the plane, $2x + 3y - 4z + 22 = 0$ measured parallel to line, $\frac{x}{1}=\frac{y}{4}=\frac{z}{5}$ is Q, then PQ is equal to :- **[JEE (Main)-2017]**

(1) $6\sqrt{5}$ (2) $3\sqrt{5}$

(3) $2\sqrt{42}$ (4) $\sqrt{42}$

20. The distantce of the point (1, 3, –7) from the plane passing through the point (1, –1, –1), having normal perpendicular to both the lines $\frac{x-1}{1}=\frac{y+2}{-2}=\frac{z-4}{3}$ and $\frac{x-2}{2}=\frac{y+1}{-1}=\frac{z+7}{-1}$, is :- **[JEE (Main)-2017]**

(1) $\frac{10}{\sqrt{74}}$ (2) $\frac{20}{\sqrt{74}}$ (3) $\frac{10}{\sqrt{83}}$ (4) $\frac{5}{\sqrt{83}}$

21. The length of the projection of the line segment joining the points (5, –1, 4) and (4, –1, 3) on the plane, x + y + z = 7 is : **[JEE (Main)-2018]**

(1) $\frac{2}{3}$ (2) $\frac{1}{3}$ (3) $\sqrt{\frac{2}{3}}$ (4) $\frac{2}{\sqrt{3}}$

22. If L_1 is the line of intersection of the planes 2x – 2y + 3z – 2 = 0, x – y + z + 1 = 0 and L_2 is the line of intersection of the planes x + 2y – z – 3 =0, 3x – y + 2z – 1 = 0, then the distance of the origin from the plane, containing the lines L_1 and L_2 is : **[JEE (Main)-2018]**

(1) $\frac{1}{3\sqrt{2}}$ (2) $\frac{1}{2\sqrt{2}}$ (3) $\frac{1}{\sqrt{2}}$ (4) $\frac{1}{4\sqrt{2}}$

23. The point P is the intersection of the straight line joining the points Q(2,3,5) and R(1,–1,4) with the plane 5x – 4y – z = 1. If S is the foot of the perpendicular drawn from the point T(2,1,4) to QR, then the length of the line segment PS is - **[IIT-2012]**

(1) $\frac{1}{\sqrt{2}}$ (2) $\sqrt{2}$ (3) 2 (4) $2\sqrt{2}$

24. The equation of a plane passing through the line of intersection of the planes x + 2y + 3z = 2 and x – y + z = 3 and at a distance $\frac{2}{\sqrt{3}}$ from the point (3, 1, –1) is **[IIT-2012]**

(1) 5x – 11y + z = 17 (2) $\sqrt{2}x + y = 3\sqrt{2} - 1$

(3) x + y + z = $\sqrt{3}$ (4) $x - \sqrt{2}y = 1 - \sqrt{2}$

***25.** If the straight lines $\frac{x-1}{2}=\frac{y+1}{k}=\frac{z}{2}$ and $\frac{x+1}{5}=\frac{y+1}{2}=\frac{z}{k}$ are coplanar, then the plane(s) containing these two lines is(are) **[IIT-2012]**

(1) y + 2z = –1

(2) y + z = –1

(3) y – z = –1

(4) y – 2z = –1

26. Perpendiculars are drawn from points on the line $\frac{x+2}{2}=\frac{y+1}{-1}=\frac{z}{3}$ to the plane x + y + z = 3. The feet of perpendiculars lie on the line **[JEE-Advanced 2013]**

(1) $\frac{x}{5}=\frac{y-1}{8}=\frac{z-2}{-13}$

(2) $\frac{x}{2}=\frac{y-1}{3}=\frac{z-2}{-5}$

(3) $\frac{x}{4}=\frac{y-1}{3}=\frac{z-2}{-7}$

(4) $\frac{x}{2}=\frac{y-1}{-7}=\frac{z-2}{5}$

***27.** A line ℓ passing through the origin is perpendicular to the lines

$\ell_1 : (3+t)\hat{i} + (-1+2t)\hat{j} + (4+2t)\hat{k}, -\infty < t < \infty$

$\ell_2 : (3+2s)\hat{i} + (3+2s)\hat{j} + (2+s)\hat{k}, -\infty < s < \infty$

Then , the coordinate(s) of the point(s) on ℓ_2 at a distance of $\sqrt{17}$ from the point of intersection of ℓ and ℓ_1 is(are) - **[JEE-Advanced 2013]**

(1) $\left(\frac{7}{3},\frac{7}{3},\frac{5}{3}\right)$ (2) (–1,–1,0)

(3) (1,1,1) (4) $\left(\frac{7}{9},\frac{7}{9},\frac{8}{9}\right)$

*28. Two lines $L_1 : x = 5, \frac{y}{3-\alpha} = \frac{z}{-2}$ and

$L_2 : x = \alpha, \frac{y}{-1} = \frac{z}{2-\alpha}$ are coplanar. Then α can take value(s) **[JEE-Advanced 2013]**

(1) 1 (2) 2 (3) 3 (4) 4

29. Consider the lines

$L_1 : \frac{x-1}{2} = \frac{y}{-1} = \frac{z+3}{1}, L_2 : \frac{x-4}{1} = \frac{y+3}{1} = \frac{z+3}{2}$

and the planes P_1:7x+y + 2z = 3, P_2 :

3x + 5y − 6z = 4. Let ax + by + cz = d be the equation of the plane passing through the point of intersection of lines L_1 and L_2 and perpendicular to planes P_1 and P_2.

Match List-I with List-II and select the correct answer using the code given below the lists.

[JEE-Advanced 2013]

	List-I		**List-II**
P.	a =	1.	13
Q.	b =	2.	−3
R.	c =	3.	1
S.	d =	4.	−2

Codes :

	P	**Q**	**R**	**S**
(1)	3	2	4	1
(2)	1	3	4	2
(3)	3	2	1	4
(4)	2	4	1	3

30. From a point P(λ,λ,λ), perpendiculars PQ and PR are drawn respectively on the lines y = x, z = 1 and y = −x, z = −1. If P is such that ∠QPR is a right angle, then the possible value(s) of λ is(are)

[JEE(Advanced)-2014]

(1) $\sqrt{2}$ (2) 1 (3) −1 (4) $-\sqrt{2}$

* **Marked Questions are multiple answer**

PREVIOUS YEARS QUESTIONS				ANSWER KEY						Exercise-II
Que.	1	2	3	4	5	6	7	8	9	10
Ans.	**2**	**2**	**4**	**2**	**3**	**2**	**2**	**4**	**3**	**3**
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	**3**	**3**	**1**	**1**	**1**	**2**	**3**	**1**	**3**	**3**
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	**3**	**1**	**1**	**1**	**2,3**	**4**	**2,4**	**1,4**	**1**	**3**