EXPECTED QUESTIONS

St Line

1. Find the equation of line in cartesian and vector form passing through point $2\hat{i} - 3\hat{j} + 4\hat{k}$ and parallel to $3\hat{i} + 4\hat{j} - 5\hat{k}$

2. Find the equation of $x$–axis.

3. Find the angle between the lines $\vec{r} = (2\hat{i} + \hat{j} - 3\hat{k}) + \lambda(\hat{i} - \hat{j} - 2\hat{k})$; $\vec{r} = (\hat{i} + 9\hat{j}) + \mu(3\hat{i} - 5\hat{j} - 4\hat{k})$.

PLANE

1. Find the direction cosines of normal to the plane $3x - 6y + 2z = 7$.

2. Find ‘$p$’ so that planes are parallel $\vec{r}(3p\hat{i} - 2\hat{j} + 3p\hat{k}) - 10 = 0$; $\vec{r}(\hat{i} - \hat{j} + \hat{k}) - 5 = 0$.

Four Marker

St Line

1. Find equation of line through $(2, -1, 1)$ and parallel to the line whose equation is $rac{x - 3}{2} = \frac{y + 1}{7} = \frac{z - 2}{-3}$

2. Find the point of intersection of the lines $\vec{r} = (\hat{i} + 2\hat{j} + 3\hat{k}) + \lambda(2\hat{i} + 3\hat{j} + 4\hat{k})$; $\vec{r} = (4\hat{i} + \hat{j}) + \lambda(5\hat{i} + 2\hat{j} + \hat{k})$.

3. Find $p$ so that lines are parallel $\vec{r} = (2\hat{i} + \hat{j} - 3\hat{k}) + \lambda(\hat{i} - \hat{j} - 2\hat{k})$; $\vec{r} = (\hat{i} + 9\hat{j}) + \mu(3\hat{i} - 3\hat{j} + p\hat{k})$.

4. Find the shortest distance between the lines $\vec{r} = (\hat{i} + 2\hat{j} + \hat{k}) + \lambda(\hat{i} - \hat{j} + \hat{k})$; $\vec{r} = (2\hat{i} - \hat{j} - \hat{k}) + \mu(2\hat{i} + \hat{j} + 2\hat{k})$.

PLANE

1. The foot of perpendicular from origin to a plane is $(2, 5, 7)$. Find the equation of plane.

2. Find the plane through $(2, -1, 3)$ and parallel to plane $3x - y + 4z + 6 = 0$.

3. Find the angle between the line $\vec{r} = (2\hat{i} + 3\hat{j} + 4\hat{k}) + \lambda(2\hat{i} + 2\hat{j} + \hat{k})$ and plane $\vec{r}.(6\hat{i} - 3\hat{j} + 2\hat{k}) + 10 = 0$.

4. Show that lines are coplanar $\vec{r} = (2\hat{j} - 3\hat{k}) + \lambda(\hat{i} + 2\hat{i} + 3\hat{j})$; $\vec{r} = (2\hat{i} + 6\hat{j} + 3\hat{k}) + \mu(2\hat{i} + 3\hat{j} + 4\hat{k})$.

Six Marker

St Line

1. Find the distance to the line $\frac{x - 6}{3} = \frac{y - 7}{2} = \frac{z - 7}{-2}$ from the point $(1, 2, 3)$.

2. Find the image in the line $\vec{r} = (11\hat{i} - 2\hat{j} - 8\hat{k}) + \lambda(10\hat{i} - 4\hat{j} - 11\hat{k})$ of the point $(2, -1, 5)$.

PLANE
1. Find the equation of plane passing through the point \((1, 0, -2)\) and perpendicular to the planes \(2x + y - z - 2 = 0, x - y - z - 3 = 0\)

2. Find the equation of plane passing through the points \((-1, 2, 3), (2, 3, 7)\) and perpendicular to the plane \(3x - 2y + 2z + 10 = 0\)

3. Find the equation of plane through the line of intersection of planes \(x + 2y + 3z = 4\) and \(2x + y - z + 5 = 0\) and perpendicular to the plane \(5x + 3y - 6z + 8 = 0\).

**LINE AND PLANE**

1. Find the length and co-ordinates of foot of perpendicular from the point \((7, 14, 5)\) to the plane \(2x + 4y - z = 2\)

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**List of important questions and examples (NCERT)**

**EXAMPLES:** 4, 7, 14, 16, 17, 19, 21, 22, 25, 26, 27, 28, 30

**Ex.11.:** 1, 3

**Ex. 11.2:** 2, 3, 4, 6, 8, 10, 11, 12, 15, 17

**Ex.11.3:** 2, 4(a), 5(b), 6(b), 10, 11, 12, 13(c), (e), 14(b), (c)

**MISC:** 3, 6, 7, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22