



# SHIKSHA CLASSES

## BOARD QUESTION PAPER

Subject : Maths- I  
Class : XII

Topic: 6 Line and Plane

Total Marks : 20  
Time : 1 Hr.

### Section A

Q.1 : Choose the correct option :

4

- i) The vector equation of a line which passes through the point with position vector  $4\hat{i} - \hat{j} + 2\hat{k}$  and is in the direction of  $-2\hat{i} + \hat{j} + \hat{k}$

a)  $\vec{r} = (4\hat{i} + \hat{j} + 2\hat{k}) + \lambda(-2\hat{i} + \hat{j} + \hat{k})$       b)  $\vec{r} = (4\hat{i} - \hat{j} + 2\hat{k}) + \lambda(-2\hat{i} + \hat{j} + \hat{k})$

c)  $\vec{r} = (4\hat{i} - \hat{j} + 2\hat{k}) + \lambda(2\hat{i} + \hat{j} + \hat{k})$       d)  $\vec{r} = (4\hat{i} + \hat{j} + 2\hat{k}) + \lambda(2\hat{i} + \hat{j} + \hat{k})$

- ii) The two planes  $3x - 6y - 2z = 7$  and  $2x + y - kz = 5$  are perpendicular to each other then value of k is equal to

- a) 3                                      b) 2                                      c) 1                                      d) 0

Q.2 : Solve the following questions:

2

- i) Verify that point having position vector  $4\hat{i} - 11\hat{j} + 2\hat{k}$  lies on the line

$$\vec{r} = (6\hat{i} - 4\hat{j} + 5\hat{k}) + \lambda(2\hat{i} + 7\hat{j} + 3\hat{k})$$

- ii) Find the vector equation of the line passing through  $2\hat{i} + \hat{j} - \hat{k}$  and parallel to the line joining points  $-\hat{i} + \hat{j} + 4\hat{k}$  and  $\hat{i} + 2\hat{j} + 2\hat{k}$

### Section B

Solve the following : (ANY2)

4

Q.3: Find the vector equation of the line passing through the point (4,2,7) and parallel to the vector  $3\hat{i} - 5\hat{j}$

Q.4: The cartesian equation of the line is  $6x - 2 = 3y + 1 = 2z - 2$  find its direction ratio.

Q.5 : Find  $\lambda$  if the lines  $\frac{x-2}{1} = \frac{y-3}{1} = \frac{z-4}{-\lambda}$  and  $\frac{x-1}{\lambda} = \frac{y-4}{2} = \frac{z-5}{1}$  are coplanar.

### Section C

: Answer the following : (ANY 2)

6

Q.6 : Find the cartesian equation of the plane  $\bar{r} \cdot (\hat{i} - \hat{j}) + \lambda(\hat{i} + \hat{j} + \hat{k}) + \mu(\hat{i} - 2\hat{j} + 3\hat{k})$

Q.7 : Find the vector equation of the plane passing through the point (1, 0, 2) and the line of intersection of planes  $\bar{r} \cdot (\hat{i} + \hat{j} + \hat{k}) = 8$  and  $\bar{r} \cdot (2\hat{i} + 3\hat{j} + 4\hat{k}) = 3$

Q.8: Find the vector equation of the line passing through the point  $2\hat{i} + \hat{j} - 3\hat{k}$  and perpendicular to the vectors  $\hat{i} + \hat{j} + \hat{k}$  and  $\hat{i} + 2\hat{j} - \hat{k}$

### Section D

: Answer the following : (ANY 1)

4

Q.9: Find the distance between the lines  $\bar{r} = \hat{i} + 2\hat{j} - 4\hat{k} + \lambda(2\hat{i} + 3\hat{j} + 6\hat{k})$  and

$$\bar{r} = 3\hat{i} + 3\hat{j} - 5\hat{k} + \mu(2\hat{i} + 3\hat{j} + 6\hat{k})$$

Q.10: Show that lines  $x = y, z = 0$  and  $x + y = 0, z = 0$  intersect each other. Find the vector equation of the plane determined by them.

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