PARISHRAM PUBLICATIONS
PUNE

Name of Topic : 3 D & Line

Subject : Maths **Class : XII**

Time : 1 : 00 Hr. **Marks : 25**

Section – A (1 Mark Each) **(5 Marks)**

Q. 1. The coordinates of the point of intersection of the lines $\frac{x-3}{1}=\frac{y+2}{-1}=\frac{z-1}{1}$ and $\frac{x}{2}=\frac{z+3}{3}$, $y=-1$ are

(a) (2, 1, 0) (b) (–2, 1, 0) (c) (2, –1, 0) (d) (–2, –1, 0)

Q. 2. The shortest distance between the lines $\bar{r}=(4\hat{i}-\hat{j})+\lambda(\hat{i}+2\hat{j}-3\hat{k})$ and $\bar{r}=(\hat{i}-\hat{j}+2\hat{k})+\mu(2\hat{i}+4\hat{j}-5\hat{k})$ is

(a) 6 units (b) $\sqrt{5}$ units (c) $\frac{6}{\sqrt{5}}$ units (d) $6\sqrt{5}$ units.

Q. 3. If the line $\bar{r}=(\hat{i}-2\hat{j}+\hat{k})+\lambda(2\hat{i}+\hat{j}+2\hat{k})$ is parallel to the plane $\bar{r}\cdot(3\hat{i}-2\hat{j}+m\hat{k})=14$, then the value of m is

(a) 2 (b) –2 (c) $\frac{2}{3}$ (d) $-\frac{1}{2}$

Q. 4. If l, m and n are d · c of a line then $l^2+m^2+n^2=\ldots$

(a) –1 (b) 1 (c) $\frac{-1}{2}$ (d) $\frac{1}{2}$

Q. 5. If $\frac{1}{7}$, m, $\frac{3}{7}$ are d · c s of a line then the value of m is

(a) $\frac{\pm\sqrt{41}}{7}$ (b) $\frac{\pm\sqrt{37}}{7}$ (c) $\frac{\pm\sqrt{39}}{7}$ (d) $\frac{\pm\sqrt{40}}{7}$

Section – B (3 Marks Each) **(12 Marks)**

Q. 6. Find the vector of magnitude 9 which is equally inclined to the coordinate axes.

Q. 7. Find the angle between the planes $\vec{r}\cdot(2\hat{i}+2\hat{j}-3\hat{k})=5$ and $\vec{r}\cdot(\hat{i}-2\hat{j}+3\hat{k})=7$.

Q. 8. The cartesian equations of the line are 3x – 1 = 6y + 2 = 1 – z. Find its equation in vector form and find direction ratio of the line.

Q. 9. By vector method, find the equation of the line passing through the point A(2, –3, –4) and parallel to $\overrightarrow{OB}$, where point o is origin and B is (2, –2, –1).

OR

Find vector equation of line passing through the point whose position vector is $3\hat{i} + \hat{j} - \hat{k}$ and parallel to the vector $2\hat{i} - \hat{j} + 2\hat{k}$. Also write the equation in cartesian form.

Section – C (4 Marks Each) **(8 Marks)**

Q. 10. Find the foot of the perpendicular from the point (0, 2, 3) on the line $\frac{x+3}{5} = \frac{y-1}{2} = \frac{z+4}{3}$. Also find length of the perpendicular.

Q. 11. Find the vector equation of the plane passing through the intersection of the planes $\vec{r} \cdot (\hat{i} + \hat{j} + \hat{k}) = 8$ and $\vec{r} \cdot (2\hat{i} + 3\hat{j} + 4\hat{k}) = 3$ and the point (1, 0, 2).

OR

If m is the foot of the perpendicular drawn from A(4, 3, 2) on the line joining the points B(2, 4, 1) and C(4, 5, 3). Find the coordinates of m.