



RK VISION ACADEMY

NEET | IIT – JEE | FOUNDATION

CBSE PRACTICE PAPER(2024)

(Mathematics)

Grade : XII

Marks: 40

marks

Chapter: 3D GEOMETRY-1

Time: 90

minutes

SECTION A

(This section comprises of Multiple-choice questions (MCQ) of 1 mark each.)

- The coordinates of the foot of the perpendicular drawn from the point $(2, 5, 7)$ on the x-axis are given by
(A) $(2, 0, 0)$ (B) $(0, 5, 0)$ (C) $(0, 0, 7)$ (D) $(0, 5, 7)$
- P is a point on the line segment joining the points $(3, 2, -1)$ and $(6, 2, -2)$. If x co-ordinate of P is 5, then its y co-ordinate is
(A) 2 (B) 1 (C) -1 (D) -2
- If α, β, γ are the angles that a line makes with the positive direction of x, y, z axis, respectively, then the direction cosines of the line are.
(A) $\sin \alpha, \sin \beta, \sin \gamma$ (B) $\cos \alpha, \cos \beta, \cos \gamma$ (C) $\tan \alpha, \tan \beta, \tan \gamma$ (D) $\cos^2 \alpha, \cos^2 \beta, \cos^2 \gamma$
- The equations of x-axis in space are
(A) $x = 0, y = 0$ (B) $x = 0, z = 0$ (C) $x = 0$ (D) $y = 0, z = 0$
- Distance of the point (α, β, γ) from y-axis is
(A) β (B) $|\beta|$ (C) $|\beta| + |\gamma|$ (D) $\sqrt{\alpha^2 + \beta^2}$
- If the direction cosines of a line are k, k, k , then
(A) $k > 0$ (B) $0 < k$ (C) $k = 1$ (D) $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}$
- The reflection of the point (α, β, γ) in the xy-plane is
(A) $(\alpha, \beta, 0)$ (B) $(0, 0, \gamma)$ (C) $(-\alpha, -\beta, \gamma)$ (D) $(\alpha, \beta, -\gamma)$
- The plane $2x - 3y + 6z - 11 = 0$ makes an angle $\sin^{-1}(\alpha)$ with x-axis. The value of α is equal to
(A) $\frac{\sqrt{3}}{2}$ (B) $\frac{\sqrt{2}}{2}$ (C) $\frac{2}{7}$ (D) $\frac{3}{7}$
- The area of the quadrilateral ABCD, where $A(0, 4, 1)$, $B(2, 3, -1)$, $C(4, 5, 0)$ and $D(2, 6, 2)$, is equal to
(A) 9 sq. units (B) 18 sq. units (C) 27 sq. units (D) 81 sq. units
- The locus represented by $xy + yz = 0$ is
(A) A pair of perpendicular lines (B) A pair of parallel lines (C) A pair of perpendicular planes (D) A pair of parallel planes

SECTION B

(This section comprises of very short answer type-questions (VSA) of 2 marks each.)

- If a line makes an angle of $30^\circ, 60^\circ, 90^\circ$ with the positive direction of x, y, z-axes, respectively, then find its direction cosines.
- The x-coordinate of a point on the line joining the points Q $(2, 2, 1)$ and R $(5, 1, -2)$ is 4. Find its z-coordinate.
- Find the equation of a plane which bisects perpendicularly the line joining the points A $(2, 3, 4)$ and B $(4, 5, 8)$ at right angles.

SECTION C

(This section comprises of short answer type questions (SA) of 3 marks each)

- 14 Find the vector equation of the line which is parallel to the vector $3\hat{i} - 2\hat{j} + 6\hat{k}$ and which passes through the point $(1, -2, 3)$.
- 15 Find the angle between the lines $\vec{r} = 3\hat{i} - 2\hat{j} + 6\hat{k} + \lambda(2\hat{i} + \hat{j} + 2\hat{k})$ and $\vec{r} = 2\hat{j} - 5\hat{k} + \lambda(6\hat{i} + 3\hat{j} + 2\hat{k})$
- 16 Find the coordinates of the point where the line through $(3, -4, -5)$ and $(2, -3, 1)$ crosses the plane passing through three points $(2, 2, 1)$, $(3, 0, 1)$ and $(4, -1, 0)$

SECTION D

(This section comprises of long answer-type questions (LA) of 5 marks each)

- 17 Find the foot of perpendicular from the point $(2, 3, -8)$ to the line $\frac{4-X}{2} = \frac{Y}{6} = \frac{1-Z}{3}$. Also, find the perpendicular distance from the given point to the line.
- 18 Find the distance of a point $(2, 4, -1)$ from the line $\frac{X+5}{1} = \frac{Y+3}{4} = \frac{Z-5}{-9}$.
- 19 Find the shortest distance between the lines given by $\vec{r} = (8 + 3\lambda)\hat{i} - 2(9 + 16\lambda) + (10 + 7\lambda)\hat{k}$ and $\vec{r} = (15 + 3\mu)\hat{i} - 2(29 + 8\mu) + (5 - 5\mu)\hat{k}$