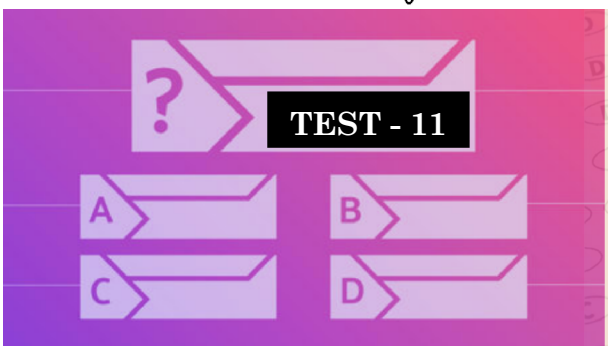

By O.P. GUPTA

MULTIPLE CHOICE TYPE QUESTIONS

For CBSE 2026 Exams - Mathematics (041) - Class 12

Topics : Three Dimensional Geometry **Max. Marks : 20**

☑ ***Select the correct option in the followings. Each question carries 1 mark.***

Q01. Distance of the point (α, β, γ) from y-axis is

(a) β (b) $|\beta|$ (c) $|\beta|+|\gamma|$ (d) $\sqrt{\alpha^2+\gamma^2}$

Q02. If the directions cosines of a line are k, k, k, then

(a) $k>0$ (b) $0<k<1$ (c) $k=1$ (d) $k=\frac{1}{\sqrt{3}}$ or $-\frac{1}{\sqrt{3}}$

Q03. The direction ratios of a line joining the points A (0, 4, 1) and B (2, 3, –1) is

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

Q04. The coordinates of the foot of the perpendicular drawn from the point (2, 5, 7) on the x-axis are

(a) (2, 0, 0) (b) (0, 5, 0) (c) (0, 0, 7) (d) (0, 5, 7)

Q05. 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 the sum of its y and z co-ordinates is

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

Q06. If θ, β, ϕ 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) $\sin\theta, \sin\beta, \sin\phi$ (b) $\cos\theta, \cos\beta, \cos\phi$ (c) $\cos\alpha, \cos\beta, \cos\gamma$ (d) $\cos^2\theta, \cos^2\beta, \cos^2\phi$

Q07. The equation of the line joining (1, 2, 3) and (–3, 4, 3) is

(a) perpendicular to the z-axis (b) perpendicular to the x-axis
(c) perpendicular to the y-axis (d) parallel to z-axis

Q08. The equation of x-axis is

(a) $\frac{x}{1}=\frac{y}{0}=\frac{z}{0}$ (b) $\frac{x}{0}=\frac{y}{1}=\frac{z}{1}$ (c) $\frac{x}{0}=\frac{y}{1}=\frac{z}{0}$ (d) $\frac{x}{0}=\frac{y}{0}=\frac{z}{1}$

Q09. A line makes equal angles with co-ordinate axes. Direction cosines of this line are

(a) $\pm1,\pm1,\pm1$ (b) $\pm\frac{1}{\sqrt{3}},\pm\frac{1}{\sqrt{3}},\pm\frac{1}{\sqrt{3}}$

(c) $\pm\frac{1}{3},\pm\frac{1}{3},\pm\frac{1}{3}$ (d) $\pm\sqrt{3},\pm\sqrt{3},\pm\sqrt{3}$

Q10. Condition for lines $x=az+b$, $y=cz+d$ and $x=a_1z+b_1$, $y=c_1z+d_1$ to be perpendicular is

(a) $ac_1+a_1c+1=0$ (b) $aa_1+cc_1+1=0$ (c) $ac_1+a_1c-1=0$ (d) $aa_1+cc_1-1=0$

Q11. The x coordinate of a point on the line joining the points P(2, 2, 1) and Q(5, 1, –2) is 4. Then its z-coordinate is

(a) 1 (b) –1 (c) 2 (d) 0

Q12. A line passes through the point with position vector $(2\hat{i}-3\hat{j}+4\hat{k})$ and makes angles 60°, 120° and 45° with x, y and z-axis respectively. Then the equation of the line in the Cartesian form is

(a) $2x-4=2y-6=\sqrt{2}\,z-4\sqrt{2}$ (b) $2x-4=-2y-6=\sqrt{2}\,z-4\sqrt{2}$

(c) $2x-4=2y+6=\sqrt{2}\,z-4\sqrt{2}$ (d) $\vec{r}=2\hat{i}-3\hat{j}+4\hat{k}+\lambda(\hat{i}-\hat{j}+\sqrt{2}\,\hat{k})$

Q13. If the lines $\frac{x+1}{-3}=\frac{y-1}{2k}=\frac{z-4}{2}$ and $\frac{x-1}{3k}=\frac{y+5}{1}=\frac{6-z}{5}$ are perpendicular, then

(a) $7k=-10$ (b) $7k=10$ (c) $10k=7$ (d) $k=-\frac{7}{10}$

Q14. The angle between the lines whose d.r.'s are a, b, c and $b-c$, $c-a$, $a-b$, is

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{2}$ (d) π

Q15. The direction ratios of the line $\frac{x-1}{2}=\frac{2y-5}{-3}$, $z=-1$ are

(a) $2, \frac{3}{2}, 0$ (b) 4, –3, 0 (c) 2, –3, 0 (d) 4, –3, 1

Q16. 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 $(1,-2,-1)$ is,

(a) $\vec{r}=(3\hat{i}-2\hat{j}+6\hat{k})+\lambda(\hat{i}-2\hat{j}-\hat{k})$ (b) $\vec{r}=(\hat{i}-2\hat{j}-\hat{k})+\lambda(3\hat{i}-2\hat{j}+6\hat{k})$

(c) $\vec{r}=(\hat{i}-2\hat{j}-\hat{k})+\lambda(3\hat{i}+2\hat{j}+6\hat{k})$ (d) $\vec{r}=-\hat{i}+2\hat{j}+\hat{k}+\lambda(3\hat{i}-2\hat{j}+6\hat{k})$

Q17. For the lines $\frac{x-1}{2}=\frac{y-2}{3}=\frac{z-3}{4}$ and $\frac{x-4}{5}=\frac{y-1}{2}=z$, the point of intersection is

(a) $(1,-1,-1)$ (b) $(-1,-1,-1)$ (c) $(-1, 1,-1)$ (d) $(-1,-1, 1)$

*Question numbers **18** to **20** are Assertion and Reason based questions. Two statements are given, one labelled **Assertion (A)** and the other labelled **Reason (R)**. Select the correct answer from the codes (a), (b), (c) and (d) as given below.*

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is **not** the correct explanation of Assertion (A).
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true.

Q18. **Assertion (A) :** The angle between the lines $\vec{r}=\hat{i}-3\hat{j}+3\hat{k}+\lambda(\hat{i}+\hat{j}-2\hat{k})$ and $\vec{r}=\hat{j}+\hat{k}+\mu(\hat{i}+2\hat{j}-\hat{k})$ is $\cos^{-1}\left(\frac{5}{6}\right)$.

Reason (R) : Angle between the lines $L_1:\vec{r}=\vec{a}_1+\lambda\vec{b}_1$ and $L_2:\vec{r}=\vec{a}_2+\mu\vec{b}_2$ is given by $\cos^{-1}\left(\frac{\vec{b}_1.\vec{b}_2}{|\vec{b}_1||\vec{b}_2|}\right)$.

Q19. **Assertion (A) :** $\frac{x}{1}=\frac{y}{1}=\frac{z}{1}$ represents a line passing through origin and (–3, –3, –3).

Reason (R) : If a line passes through the points (x_1,y_1,z_1) and (x_2,y_2,z_2), then its equation can be written as $\frac{x-x_1}{x_2-x_1}=\frac{y-y_1}{y_1-y_2}=\frac{z-z_1}{z_2-z_1}$.

Q20. **Assertion (A) :** The vector equation of a line passing through the point (1, 2, –1) and parallel to the line $5x-25=14-7y=35z$, is $\vec{r}=\hat{i}+2\hat{j}-\hat{k}+\lambda(7\hat{i}-5\hat{j}+\hat{k})$.

Reason (R) : $\frac{x-x_1}{a_1}=\frac{y-y_1}{b_1}=\frac{z-z_1}{c_1}$ and $\frac{x-x_2}{a_2}=\frac{y-y_2}{b_2}=\frac{z-z_2}{c_2}$ are perpendicular lines if $a_1a_2+b_1b_2+c_1c_2=0$.

This document contains MCQs for Mathematics (041) of class XII.
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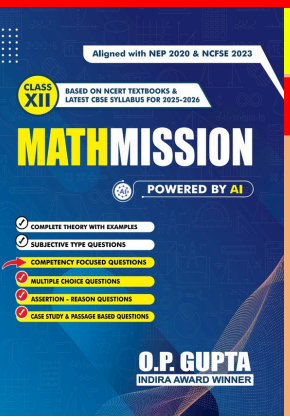

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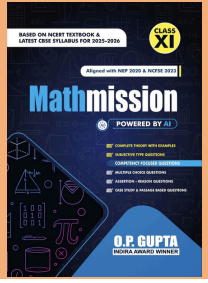

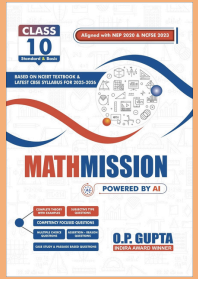

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