

MULTIPLE CHOICE QUESTIONS (MCQs)3D(BIS/041/LINE)

Mark the correct alternative in each of the following:

Q 1. The angle between the straight lines

$$\frac{x+1}{2} = \frac{y-2}{5} = \frac{z+3}{4} \text{ and } \frac{x-1}{1} = \frac{y+2}{2} = \frac{z-3}{-3} \text{ is}$$

- (a) 45° (b) 30° (c) 60° (d) 90°

Q 2. The lines $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ and $\frac{x-1}{-2} = \frac{y-2}{-4} = \frac{z-3}{-6}$ are

- (a) coincident (b) skew (c) intersecting (d) parallel

Q 3. The direction ratios of the line perpendicular to the lines

$$\frac{x-7}{2} = \frac{y+17}{-3} = \frac{z-6}{1} \text{ and } \frac{x+5}{1} = \frac{y+3}{2} = \frac{z-4}{-2} \text{ are proportional to}$$

- (a) 4,5,7 (b) 4,-5,7 (c) 4,-5,-7 (d) -4,5,7

Q 4. The angle between the lines $\frac{x-1}{1} = \frac{y-1}{1} = \frac{z-1}{2}$, $\frac{x-1}{-\sqrt{3}-1} = \frac{y-1}{\sqrt{3}-1} = \frac{z-1}{4}$ is

- (a) $\cos^{-1}\left(\frac{1}{65}\right)$ (b) $\frac{\pi}{6}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{4}$

Q 5. The direction ratios of the line $x - y + z - 5 = 0 = x - 3y - 6$ are proportional to

- (a) 3, 1, -2 (b) 2, -4, 1 (c) $\frac{3}{\sqrt{14}}, \frac{1}{\sqrt{14}}, \frac{-2}{\sqrt{14}}$ (d) $\frac{2}{\sqrt{14}}, \frac{-4}{\sqrt{14}}, \frac{1}{\sqrt{14}}$

Q 6. The perpendicular distance of the point P (1, 2, 3) from the line $\frac{x-6}{3} = \frac{y-7}{2} = \frac{z-7}{-2}$ is

- (a) 7 (b) 5 (c) 0 (d) none of these

Q 7. The equation of the line passing through the points

$a_1 i + a_2 j + a_3 k$ and $b_1 i + b_2 j + b_3 k$ is

- (a) $\vec{r} = (a_1 i + a_2 j + a_3 k) \lambda + (b_1 i + b_2 j + b_3 k) t$ (b) $\vec{r} = (a_1 i + a_2 j + a_3 k) - t (b_1 i + b_2 j + b_3 k)$
 (c) $\vec{r} = a_1 (1 - r) i + a_2 (1 - t) j + a_3 (1 - t) k + t (b_1 i + b_2 j + b_3 k)$ (d) none of these

Q 8. If a line makes angles α , β and γ with the axes respectively, then

$$\cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma =$$

- (a) -2 (b) -1 (c) 1 (d) 2

Q 9. If the direction ratios of a line are proportional to 1, -3, 2, then its direction cosines are

- (a) $\frac{1}{\sqrt{14}}, -\frac{3}{\sqrt{14}}, \frac{2}{\sqrt{14}}$ (b) $\frac{1}{\sqrt{14}}, \frac{2}{\sqrt{14}}, \frac{3}{\sqrt{14}}$
 (c) $-\frac{1}{\sqrt{14}}, \frac{3}{\sqrt{14}}, \frac{2}{\sqrt{14}}$ (d) $-\frac{1}{\sqrt{14}}, -\frac{2}{\sqrt{14}}, -\frac{3}{\sqrt{14}}$

- Q 10. If a line makes angle $\frac{\pi}{3}$ and $\frac{\pi}{4}$ with x-axis and y-axis respectively, then the angle made by the line with z-axis is
 (a) $\pi/2$ (b) $\pi/3$ (c) $\pi/4$ (d) $5\pi/12$
- Q 11. The projections of a line segment on X, Y, Z axes are 12,4,3, The length and direction cosines of the line segment are
 (a) $13, \frac{12}{13}, \frac{4}{13}, \frac{3}{13}$ (b) $19, \frac{12}{19}, \frac{4}{19}, \frac{3}{19}$ (c) $11, \frac{12}{11}, \frac{4}{11}, \frac{3}{11}$ (d) None of these
- Q 12. The lines $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ and $\frac{x-1}{-2} = \frac{y-2}{-4} = \frac{z-3}{-6}$ are
 (a) parallel (b) intersecting (c) skew (d) coincident
- Q 13. The straight line $\frac{x-3}{3} = \frac{y-2}{1} = \frac{z-1}{0}$ is
 (a) parallel to x-axis (b) parallel to y-axis
 (c) parallel to z-axis (d) perpendicular to z-axis
- Q 14. The shortest distance between the lines
 $\frac{x-3}{3} = \frac{y-8}{-1} = \frac{z-3}{1}$ and, $\frac{x+3}{-3} = \frac{y+7}{2} = \frac{z-6}{4}$ is
 (a) $\sqrt{30}$ (b) $2\sqrt{30}$ (c) $5\sqrt{30}$ (d) $3\sqrt{30}$

ANSWERS

1. (d) 2. (a) 3. (a) 4. (c) 5. (a) 6. (a) 7. (c) 8. (d) 9. (a) 10. (b)
 11. (a) 12. (a) 13. (d) 14. (d)