CHAPTER – 11 (THREE DIMENSION GEOMETRY)

MULTIPLE CHOICE QUESTIONS

Sl. No	Questions
1	Direction ratio of line are (4,2, -4) then direction cosine of line is: (a) $\frac{2}{3},\frac{1}{3},-\frac{2}{3}$ (b) $-\frac{2}{3},\frac{1}{3},\frac{2}{3}$ (c) $\frac{4}{3},\frac{1}{3},-\frac{4}{3}$ (d) $-\frac{4}{3},\frac{1}{3},\frac{2}{3}$
2	If the points A(2,3,4) B(-1,-2,1) and C(x,y,z) are collinear then coordinates of point C is (a) (8,5,7) (b) (5,8,7) (c) (-5,8,7) (d) (8,-5,7)
3	Equation of y-axis in space are (a) $x=0, y=0$ (b) $x=0, z=0$ (c) $y=0, z=0$ (d) $y=0$
4	Distance of plane $\vec{r}.(2\hat{i}+3\hat{j}-6\hat{k})+2=0$ from origin is (a) 2 (b) 14 (c) $\frac{2}{7}$

	(d) $-\frac{2}{7}$
5	Direction ratio of line joining the points (-2,4,-5), (1,2,3) (a) (3,-2,8) (b) (-3,2,-8) (c) (1,-2,2) (d) (-1,2,-2)
6	Distance between planes $\vec{r}.(2\hat{i}+\hat{j}-2\hat{k})+5=0$ and $\vec{r}.(6\hat{i}+3\hat{j}-6\hat{k})+2=0$ is (a) $\frac{9}{13}$ (b) $\frac{13}{9}$ (c) $\frac{15}{4}$ (d) $\frac{1}{13}$
7	Equation of line passing through (1,2,-3) and parallel to line $\frac{x-2}{1}=\frac{y+1}{3}=\frac{z-1}{4}$ is (a) $\frac{x-1}{1}=\frac{y+1}{3}=\frac{z-3}{4}$ (b) $\frac{x-1}{1}=\frac{y-2}{3}=\frac{z+3}{4}$ (c) $\frac{x-2}{1}=\frac{y+1}{2}=\frac{z-1}{-3}$

	(d) $\frac{x-1}{1}=\frac{y-3}{2}=\frac{z-4}{-3}$
8	If the planes $a_1x+b_1y+c_1z+d_1=0$ and $a_2x+b_2y+c_2z+d_2=0$ are perpendicular to each other then (a) $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$ (b) $\frac{a_1}{b_1}=\frac{a_2}{b_2}=\frac{c_1}{c_2}$ (c) $a_1a_2+b_1b_2+c_1c_2=0$ (d)
9	The distance of the plane 2x-3y+6z+7=0 from the point (2,-3,-1) is (a) 1/5 (b) 3 (c) 4 (d) 2
10	Direction cosine of the normal to the plane 2x-3y-6z-3=0 are (a) $\frac{2}{7},\frac{-3}{7},\frac{-6}{7}$ (b) $\frac{2}{7},\frac{3}{7},\frac{6}{7}$ (c) $-\frac{2}{7},\frac{-3}{7},\frac{-6}{7}$ (d) $-\frac{2}{7},\frac{3}{7},\frac{6}{7}$
11	The equation of the plane through the origin and parallel to the plane 2x-4y+5z+7=0 is (a) 2x-4y+5z-7=0 (b) 2x-4y-5z+7=0 (c) 2x-4y+5z=0 (d) 2x+4y-5z+7=0
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	The planes $\vec{r}\cdot(2\hat{i}+3\hat{j}-6\hat{k})=7$ and $\vec{r}\cdot(-\frac{2}{7}\hat{i}-\frac{3}{7}\hat{j}+\frac{6}{7}\hat{k})=0$ are (a) parallel (b) perpendicular (c) equidistant from origin (d) none of these
13	Shortest distance between the lines $\frac{x+1}{7}=\frac{y+1}{-6}=\frac{z+1}{1}$ and $\frac{x-3}{1}=\frac{y-5}{-2}=\frac{z-7}{1}$ (a) (b) (c) 3 (d)
14	The equation of X-axis is: (a) x=0, y=0 (b) y=0, z-0 (c) z=0, x= 0 (d) x= 0
15	The direction cosines of z- axis are: (a)< 1,0,0 > (b)< 0,1,0 > (c)< 0,0,1 > (d)< 1,1,1 >
16	If the direction cosines of a line are < k, k, k> then (a) k > 0 (b) k = 1 (c) 0 < k < 1 (d) k = or k = -

17	If a line makes an angle of $\frac{\pi}{4}$ with positive directions of x-axis and y – axis , then the angle that the line makes with the positive direction of z- axis is (a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$
18	The vector equation of the line : $\frac{3-x}{5} = \frac{y+4}{7} = \frac{2-z}{4}$ is (a) $\vec{r} = 3\hat{i} - 4\hat{j} + 3\hat{k} + \lambda(-5\hat{i} + 7\hat{j} + 2\hat{k})$ (b) $\vec{r} = 5\hat{i} + 7\hat{j} + 4\hat{k} + \lambda(3\hat{i} + 4\hat{j} + 6\hat{k})$ (c) $\vec{r} = 3\hat{i} - 4\hat{j} + 6\hat{k} + \lambda(-5\hat{i} + 7\hat{j} + 2\hat{k})$ (d) $\vec{r} = 3\hat{i} - 4\hat{j} + 3\hat{k} + \lambda(5\hat{i} + 7\hat{j} + 2\hat{k})$
19	The lines $\frac{x-2}{1} = \frac{y-3}{1} = \frac{z-4}{-k}$ and $\frac{x-1}{k} = \frac{y-4}{1} = \frac{z-5}{1}$ are coplanar if (a) k = 0 (b) k = - 1 (c) k = -3 (d) k = 3

20	The coordinates of the foot of perpendicular drawn from the point P(-2,5,4) on the x- axis are (a) (-2,0,0) (b) (0,5,0) (c) (0,0,4) (d) (0,5,4)
21	The distance of the point P(α ,β ,γ) from x-axis is (a) | α | (b) (c) (d)
22	The reflection of the point P (α, β, γ) in the XY-plane is (a) (α, β ,0) (b) (0 ,0, γ) (c) (-α, -β, γ) (d) (α, β, -γ)
23	The equation of plane which cuts equal intercepts of unit's length on coordinate axes is (a) x +y +z = 1 (b) x+y+z+1 = 0 (c) x +y-z = 1 (d) x-y-z = 1
24	Equation of the line passing through (1,1,1) and perpendicular to the plane 2x+3y+z+5 = 0 are (a) $\frac{x-1}{3}=\frac{y-1}{5}=\frac{z-1}{6}$ (b) $\frac{x-1}{2}=\frac{y-1}{3}=\frac{z-1}{1}$ (c) $\frac{x-1}{1}=\frac{y-1}{5}=\frac{z-1}{6}$ (d) $\frac{x-1}{3}=\frac{y-1}{2}=\frac{z-1}{1}$

25	The ratio in which the line segment joining the points (-2,4,5) and (3, 5, -4) is divided by the yz-plane is (a) 3 : 2 (b) 2:3 (c) – 2.3 (d) – 3.4
26	Find The equation of the line that passes through the points $(3,2,5)$, $(3,2,6)$? (a) $\frac{x-3}{0} = \frac{y+2}{0} = \frac{z+5}{11}$ (b) $\frac{x-3}{1} = \frac{y+2}{1} = \frac{z}{1}$ (c) $\frac{x+3}{0} = \frac{y+2}{0} = \frac{z+5}{11}$ (d) none
27	Find the distance from the origin to the plane 2 x – y + 2 z + 3 = 0? (a)1 (b)2 (c)3 (d) none
28	Find the distance between the planes 2 x + 3 y + 4 z = 4 and 4 x + 6 y + 8 z = 12? (a) $\frac{2}{\sqrt{29}}$ (b) $\frac{2}{29}$ (c) 0 (d)none
29	Find the angles which the vector $i-j+k$ makes with the co-ordinate axes? (a) $\cos^{-1}(\frac{1}{\sqrt{3}}), \cos^{-1}(\frac{-1}{\sqrt{3}}), \cos^{-1}(\frac{1}{\sqrt{3}})$ (b) $\cos^{-1}\frac{1}{3}, \cos^{-1} 1/3,$ (c) $\cos^{-1} 1/3$ (d)none
30	A line makes angles 60° and 45° with x and y axis respectively. Find the acute angle which it makes with z-axis? (a) $\pi/3$ OR 60^0 (b) 30^0 (c) 5^0 (d)none

31	Write the equation of a line passing through origin and parallel to x-axis. (a) $\vec{r} = \lambda \hat{i}$ (b) $\vec{r} = \lambda j$ (c) $\vec{r} = \lambda k$ (d)none
32	Find the equation of a line passing through the points (-1, 0, 2) and (3, 4,6). (a) $\vec{r} = (-\hat{i} + 2\hat{k}) + \lambda(4i + 4j + 4k)$ (b) $\vec{r} = (\hat{i} + 2\hat{j} + 3\hat{k}) + \lambda(i + 2j - 5k)$ (c) $\vec{r} = (5\hat{i} - 4\hat{j} + 6\hat{k}) + \lambda(3i + 7j + 2k)$ (d) non of these
33	If the direction cosines of a line are $\frac{9}{11}, \frac{6}{11}, -\frac{2}{11}$, then what are its direction ratios? (a) 9,6,-2 (b) 9,0,-2(c) 9,6,2 (d) 0,6,-2

34	The direction ratios of line segment joining two points P (x_1, y_1, z_1) and Q(x_2 ,y_2,z_2)
	(a) x_1-x_2 , $y_1 - y_2$, z_1-z_2 (b) x_1-y_1 ,x_2-y_2 ,x_3-y_3 (c)$x_1- z_1$,x_2-z_2, $x_3- z_3$ (d) y_1-z_1 , y_2-z_2 ,y_3-z_3
35	The direction cosine of line segment joining two points P(-2,4,-5) and Q(1 ,2, 3)
	(a) (b) (c) (d)
36	The shortest distance between two lines $\vec{r} = \vec{a}_1 + \lambda \vec{b}_1$ and $\vec{r} = \vec{a}_2 + \mu \vec{b}_2$ is given by

	(a) $\left\lvert \frac{(\vec{b}_1 \times \vec{b}_2) \times (\vec{a}_2 - \vec{a}_1)}{\lvert \vec{b}_1 \times \vec{b}_2 \rvert} \right\rvert$ (b) $\left\lvert \frac{(\vec{b}_1 . \vec{b}_2) \times (\vec{a}_2 - \vec{a}_1)}{\lvert \vec{b}_1 \times \vec{b}_2 \rvert} \right\rvert$ (c) $\left\lvert \frac{(\vec{b}_1 - \vec{b}_2) . (\vec{a}_2 \times \vec{a}_1)}{\lvert \vec{b}_1 \times \vec{b}_2 \rvert} \right\rvert$ (d) $\left\lvert \frac{(\vec{b}_1 \times \vec{b}_2) . (\vec{a}_2 - \vec{a}_1)}{\lvert \vec{b}_1 \times \vec{b}_2 \rvert} \right\rvert$
37	If l, m and n represents the direction cosines of a line then $l^2 + m^2 + n^2 =$
	(a) 0 (b) 1 (c) 2 (d) -1
38	The cosine of angle between two planes $\vec{r} . \vec{n}_1 = d_1$ and $\vec{r} . \vec{n}_2 = d_2$ is given by
	(a) $\left\lvert \frac{\vec{n}_1 . \vec{n}_2}{\lvert \vec{n}_1 \rvert \lvert \vec{n}_2 \rvert} \right\rvert$

	(b) $\left\|\frac{\vec{n_1} \times \vec{n_2}}{\vec{n_1} \cdot \vec{n_2}}\right\|$ (c) $\left\|\frac{\vec{n_1} - \vec{n_2}}{\vec{n_1} \cdot \vec{n_2}}\right\|$ (d) $\left\|\frac{\vec{n_1} \cdot \vec{n_2}}{\vec{n_1} \times \vec{n_2}}\right\|$
39	The cartesian equation of the plane $\vec{r} \cdot (\hat{i} + \hat{j} - \hat{k}) = 2$ is
	(a) 2x-y+3z=1 (b) x-y-z=2 (c)x-y+z=2 (d) x+y-z=2
40	The equation of a plane parallel to x- axis is
	(a) ax+by =d (b) ay+bz+d=0 (c) z=0 (d) y=0, z=0
41	The direction ratios of the line $\frac{3-x}{2} = \frac{2y-1}{3} = \frac{z}{1}$ *are*
	(a) 2 , 3 , 1 (b) -2 ,3 ,-1 (c)-2 , 3/2 , 1 (d) 3, -1, 0

42	The condition for coplanarity of two lines $\vec{r} = \vec{a}_1 + \lambda \vec{b}_1$ and $\vec{r} = \vec{a}_2 + \mu \vec{b}_2$ is
	(a) $(\vec{b}_1 - \vec{b}_2).(\vec{a}_1 \times \vec{a}_2) = 0$ (b) $(\vec{b}_1 . \vec{b}_2) \times (\vec{a}_2 - \vec{a}_1) = 0$ (c) $(\vec{b}_1 \times \vec{b}_2).(\vec{a}_2 - \vec{a}_1) = 0$ (d) $(\vec{b}_1 \times \vec{b}_2) \times (\vec{a}_2 - \vec{a}_1) = 0$
43	The number of planes that pass through the points (1,1,-1) ,(6,4,-5) and (-4,-2,3) is
	(a) one plane (b) two planes (c) three planes (d) infinite planes
44	If the lines $\frac{x-1}{-3} = \frac{y-2}{2} = \frac{z-4}{k}$ and $\frac{x-3}{2} = \frac{y-2}{3} = \frac{z-1}{k}$ are perpendicular to each other ,then k =
	(a) $\frac{-11}{12}$ (b) $\frac{11}{12}$ (c) $\frac{12}{11}$ (d) $-\frac{12}{11}$
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	The equation of the plane which is at a distance 5 units from the origin and perpendicular to the vector $(\hat{i}+\hat{j}-\hat{k})$.
	(a) $\vec{r}.(\hat{i}+\hat{j}-\hat{k}) = 5$ (b)) (c) (d))) $\vec{r}.\frac{(\hat{i}+\hat{j}-\hat{k})}{5} = 3$
46	The coordinates of the point where the line through the line through (3,-4,-5) and (2,-3,1) crosses the plane 2x+y+z=7 are
	(a) (1,-2,7) (b) (1,2,7) (c) (1,2,-7) (d) (-1,-2,7)

47	If a plane has the intercepts a ,b ,c and is at a distance of p units from the origin ,then $\frac{1}{a^2}+\frac{1}{b^2}+\frac{1}{c^2} = ?$
	(a) $\frac{1}{p}$ (b) $\frac{1}{p^2}$ (c) $\frac{1}{p^3}$ (d $\frac{1}{p^4}$
48	A line makes angle α, β, γ with x-axis, y-axis and z-axis respectively then cos 2α + cos 2β + cos 2γ is equal to
	a) 2 (b) 1 (c) -2

	(d) -1
49	The line joining the points (0, 5, 4) and (1, 3, 6) meets XY-plane at the point
	(a) (-2,9,0) (b) (2,-9,0) (c) (0,-2,9) (d) (9,0,-2)
50	Find the equation of plane passing through the points P(1, 1, 1), Q(3, -1, 2), R(-3, 5, -4)
	(a) x + 2y = 0 (b) x – y = 2 (c) -x + 2y = 2 (d) x + y = 2
51	**The lines** $\frac{x+3}{-3}=\frac{y-1}{1}=\frac{z-5}{5}$ **and** $\frac{x+1}{-1}=\frac{y-2}{2}=\frac{z-5}{5}$ **are**
	(a) coplanar (b) non-coplanar (c) perpendicular (d) None of the above
52	If a line makes an angle of 30°, 60°, 90° with the positive direction of x, y, z-axes, respectively, then find its direction cosines.
	(a) ± (√3/2,1/2,0) (b) (√3/2,1/2,0) (c)) -(√3/2,1/2,0) (d)) ± (-√3/2,1/2,0)
53	The distance of the point whose position vector is $(2\hat{i}+\hat{j}-\hat{k})$ from the plane $\vec{r}.(\hat{i}-2\hat{j}+4\hat{k})=9$
	(a)(b) (c)(d)
54	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)
	(a) (1, – 2, 7) (b) (0, – 2, 7). (c) (1, – 2,- 7) (d) (1, –0, 7).
55	The distance of a point P (a, b, c) from x-axis is
	(A) $\sqrt{a^2+c^2}$ (B) $\sqrt{a^2+b^2}$ (C) $\sqrt{b^2+c^2}$ (D) b^2+c^2
56	For every point (x, y, z) on the y – axis (a) x = y = 0 (b) x = z = 0

	(c) y = z = 0 (d) x = z = 0 but y is nonzero
57	Two lines not lying in the same plane are called (a) parallel (b) Coincident (c) Intersecting (d) skew
58	The line $\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-4}{5}$ is parallel to the plane (a) $3x + 4y + 5z = 7$ (b) $2x + 3y + 4z = 0$ (c) $x + y - z = 0$ (d) $2x + y - 2z = 0$
59	The line $6x = 3y = 2z$ and the plane $x - 2y + z = 0$ (a) meet at a point (b) are parallel (c) Meet in infinitely many points (d) none of these
60	What are the direction ratios of the normal of the plane $2x + y - 2z = 6$ (a) 6, 6, 6 (b) 3, 6, -3 (c) 2, 1, -2 (d) 1, 2, 1
61	What is the distance of plane $\vec{r}.(i - 2j + 2k) = 6$ from origin? (a) 1 unit (b) 6 units (c) units (d) None of these
62	What would be the lengths of intercepts of a plane which meets the axes in A, B, C such that centroid of triangle ABC is (1, -2, 3)? (a) 1, -2, 3 (b) 3, -6, 9 (c) 1, 1, 1 (d) None of these
63	Find the equations of plane in Cartesian form if it passes through $(2i + 3j - 4k)$ and parallel to the line $r = (2i + j - 7k) + \mu(i - 2j + 3k)$. (a) $x - 2y + 3z = -16$ (b) $2x - y + 3z = -16$ (c) $3x - y + 2z = 16$ (d) All of these

ANSWERS

Q. No.	Answers
1	a
2	b

3	b
4	c
5	a
6	b
7	b
8	c
9	d
10	a
11	c
12	a
13	b
14	(b) y=0,z-0
15	(c). < 0,0,1 >
16	(d) k = or k = -
17	(d) $\frac{\pi}{2}$
18	(D) $\vec{r} = 3\hat{i} - 4\hat{j} + 3\hat{k} + \lambda(-5\hat{i} + 7\hat{j} + 2\hat{k})$
19	(b) k = - 1
20	(D) (-2,0,0)
21	(d)
22	(d) (α ,β ,-γ)
23	(A) x +y +z = 1
24	(b) $\frac{x-1}{2} = \frac{y-1}{3} = \frac{z-1}{1}$
25	(b) 2:3
26	a
27	a
28	a
29	a
30	a
31	a
32	a
33	a
34	a
35	b
36	d
37	b
38	a

39	d
40	b
41	c
42	c
43	d
44	d
45	c
46	a
47	b
48	d
49	a
50	d
51	a
52	a
53	c
54	a
55	C
56	b
57	d
58	d
59	c
60	c
61	d
62	b
63	a

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