CHAPTER – 11 (THREE DIMENSION GEOMETRY)

ASSERTION REASON TYPE QUESTIONS

Sl. No	Question
	Study the two statements labeled as assertion (A) reason (R). Point out if : (A) Both Assertion and reason are true and reason is correct explanation of assertion. (B) Assertion and reason both are true but reason is not the correct explanation of assertion. (C) Assertion is true, reason is false. (D) Assertion is false, reason is true.
1	Assertion: Equation of line Passing through the point (1,2,3) and (2,-1,5) is $\frac{x-1}{1}=\frac{y-2}{-3}=\frac{z-3}{2}$ Reason : Equation of line passing through the point (x_1,y_1,z_1) and (x_2,y_2,z_2) is $\frac{x-x_1}{x_2-x_1}=\frac{y-y_1}{y-y_1}=\frac{z-z_1}{z_2-z_1}$
2	Assertion: The Perpendicular distance from point(2,1,-1) from the plane x-2y+4z = 9 is Reason : The Perpendicular distance p from point $P(x_1,y_1,z_1)$ to the plane Ax+By+Cz+D = 0 is given by p =
3	Assertion: Equation of plane cuts intercepts 2,3 and 4 on the x-axis,y-axis and z- axis respectively then its equation is 6x+4y+3z = 1 Reason: Ifplane cuts intercepts a, b and c on the x-axis,y-axis and z- axis respectively then its equation is $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=1$
4	Assertion: Lines $\frac{x+1}{3}=\frac{y+3}{5}=\frac{z+5}{7}$ and $\frac{x-2}{1}=\frac{y-4}{3}=\frac{z-6}{5}$ intersects to each other Reason: Two non-parallel lines $\vec{r}=\vec{a_1}+\lambda\vec{b_1}$ and $\vec{r}=\vec{a_2}+\mu\vec{b_2}$ will intersect iff

	$(\vec{a_2} - \vec{a_1}).(\vec{b_1} X \vec{b_2}) = 0$
5	Assertion: Lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-4}{5} = \frac{y-1}{2} = z$ are skew line Reason: Two lines are called Skew iff they are neither parallel nor intersecting
6.	Assertion: distance of a point (2,5,-3) from the plane $\vec{r}.(6\hat{i} - 3\hat{j} + 2\hat{k}) = 4$ is 4 Reason: distance of point (a,b,c) from the plane Ax+By+Cz=D is
7	Assertion: lines $\frac{x+2}{-2} = \frac{y-1}{3} = \frac{z-2}{1}$ and $\frac{x-3}{-3} = \frac{y}{-2} = \frac{z+1}{2}$ are coplanar Reason: if two lines are perpendicular then these lines are coplanar.
8	Assertion: direction cosine of line whose direction ratios are 2, -1, -2 are 2/3, -1/3, -2/3. Reason: direction ratios and direction cosine are proportional to each other.
9	Assertion: equation of line through the point (5,2,-4) and parallel to the vector $(3\hat{i} + 2\hat{j} - 8\hat{k})$ is $\frac{x-5}{3} = \frac{y-2}{2} = \frac{z+4}{-8}$ Reason: equation of a line the point whose position vector is $\vec{a}$ and parallel to the vector $\vec{b}$ is $\vec{r} = \vec{a} + \lambda \vec{b}$
10	Assertion: Direction cosine of the normal to the plane 2x-3y-6z-3=0 are $\frac{2}{7}, -\frac{3}{7}, -\frac{6}{7}$ Reason: direction cosine are equal to the direction ratio
11.	Assertion: If a,b and c are the direction ratio of a line then ka,kb and kc is also a set of direction ratios. Reason: two sets of direction ratios of a line are in proportion.
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	Assrtion:The pair of lines given by $r=i-j+\lambda(2i+k)$ and $r=2i-k+\mu(i+j+k)$ intersect. Reason: Two lines are intersect each other, if they are not parallel and shortest distance =0
13.	Assertion:The lines $\frac{x-4}{1}=\frac{y+1}{-2}=\frac{z}{1}$ and $\frac{x-9}{13}=\frac{y-16}{7}=\frac{z-16}{-1}$ are coplanar. Reason:Tw lines $\frac{x-x^1}{a^1}=\frac{y-y^1}{b^1}=\frac{z-z^1}{c^1}$ and $\frac{x-x^2}{a^2}=\frac{y-y^2}{b^2}=\frac{z-z^2}{c^2}$ are coplanar if
14.	Assersion:The shortest distance between the skew limes $r=a+\alpha b$ and $r=c+\beta d$ is $\frac{\|[a-cbd]\|b\times d\|}{}$ Reason: Two lines are skew lines if them exist no plane passing through them.
15	Assertion:The direction cosine of a line are $\cos\alpha$, $\cos\beta$ and $\cos\gamma$ where α, β and γ are the angles made by the line with x , y and z -axis respectively ; Reason: If a line makes angles 90 ° , 135 ° ,45 ° with x ,y and z -axes respectively,then it's direction cosines are 0 , .
16	Assertion: The points (2,3,4) , (-1,-2,1) and (5,8,7) are collinear Reason: The direction ratios of line segment joining two points P(x_1 ,y_1 ,z_1) and Q(x_2 ,y_2,z_2) are (x_1-x_2), (y_1-y_2) and (z_1-z_2
17	Assertion:The vector equation of a plane is given by $\vec{r}\cdot\vec{n}=d$ Reason: The vector equation of a line is given by $\vec{r}=\vec{a}+\lambda\vec{b}$
18	Assertion: The length of perpendicular from the origin to the plane $\vec{r}\cdot\vec{n}=d$ is given by $\frac{\|d\|}{\|\vec{n}\|}$. Reason: The distance of the plane 2x-3y+4z-6=0 from the origin is given by
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	Assertion:The equation of plane passing through intersection of two planes $\vec{r}\cdot\vec{n_1} = d_1$ and $\vec{r}\cdot\vec{n_2} = d_2$ is given by $\vec{r}\cdot(\vec{n_1} + \lambda\vec{n_2}) = d_1 + \lambda d_2$ Reason: Two lines $\vec{r} = \vec{a_1} + \lambda\vec{b_1}$ and $\vec{r} = \vec{a_2} + \mu\vec{b_2}$ are coplaner if $(\vec{b_1} \times \vec{b_2}).(\vec{a_2} - \vec{a_1}) = 0$
20	Assertion: the direction cosines of the line passing through the two points (– 2, 4, – 5) and (1, 2, 3) are Reason: We know the direction cosines of the line passing through two points P($x1$, $y1$, $z1$) and Q($x2$, $y2$, $z2$) are given by $\frac{x_2 - x_1}{PQ}, \frac{y_2 - y_1}{PQ}, \frac{z_2 - z_1}{PQ}$
21	Assertion: the direction cosines of x, y and z-axis are (1,0,0),(0,1,0),(0,0,1) Reason: We know the direction cosines of the line passing through two points P($x1$, $y1$, $z1$) and Q($x2$, $y2$, $z2$) are given by $\frac{x_2 - x_1}{PQ}, \frac{y_2 - y_1}{PQ}, \frac{z_2 - z_1}{PQ}$
22	Assertion: the vector equation for the line passing through the points (–1, 0, 2) and (3, 4, 6).is $\vec{r} = (-\hat{i} + 2\hat{k}) + \mu(4\hat{i} + 4\hat{j} + 4\hat{k})$ Reason: equation of line passing through two points is $\frac{x - x_1}{x_2 - x_1} = \frac{y - y_1}{y_2 - y_1} = \frac{z - z_1}{z_2 - z_1} = \mu$
23	Assertion: equations of the plane passing through the points R(2, 5, – 3), S(– 2, – 3, 5) and T(5, 3,– 3) can be given by ax+by+cz+d=0,where a,b,c are the dc's of the normal to the plane Reason: there can be passed infinitely many points from three non-collinear points
24	Assertion:equation of plane is x+y+z=1 Reason: dc's of the plane are (
25	Assertion(A): The vector equation for the line which passes through the point (1, 2, 3) and is parallel to the line $\frac{x}{-2} = \frac{y}{-3} = \frac{z}{4}$ is $\hat{i} + 2\hat{j} + 3\hat{k} + \mu(-2\hat{i} - 3\hat{j} + 4\hat{k})$. Reason (R): The vector equation for the line which passes through the point (x_1, y_1, z_1) and is parallel to the line $\frac{x - a}{\alpha} = \frac{y - b}{\beta} = \frac{z - c}{\gamma}$ is

	$\vec{r} = x_1\hat{i} + y_1\hat{j} + z_1\hat{k} + \mu(a\hat{i} + b\hat{j} + c\hat{k})$.
26	Assertion(A): The d.r's of the line joining origin and point (x, y, z) must be x, y, z. Reason (R): If P(x, y, z) is a point in space and OP = r, then d.c's of OP are x/r, y/r, z/r
27	Assertion(A): The points (2, 1, 5) and (3, 4, 3) lie on opposite side of the plane $2x + 2y - 2z - 1 = 0$ Reason (R): The algebraic perpendicular distance from the given points to the plane have opposite sign.
28	Assertion(A) : $3x + 2y - z = 7$ *and* $6x + 4y - 2z = 3$ are parallel planes. Reason (R) : Direction ratio of normal of two parallel planes are proportional.
29	Assertion(A): Distance between $3x + 2y - z = 7$ *and* $6x + 4y - 2z = 3$ is 4 unit Reason (R): Distance between two parallel planes can be given by

ANSWER KEY- ASSERTION REASON TYPE QUESTIONS

Q.NO.	ANSWER
1	A
2	A
3	D
4	A
5	D
6	A
7	B
8	A
9	A
10	C
11	A
12	A
13	D
14	C
15	A
16	A
17	B
18	C
19	B
20	A
21	A

22	A
23	C
24	B
25	C
26	A
27	A
28	A
29	D

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