CHAPTER – 10

VECTORS

TRUE / FALSE QUESTIONS

SL NO	QUESTIONS
1	Mathematically a vector is defined as a "directed line segment."
2	If vectors are equal then their magnitudes are equal but the converse may not be true.
3	If $\overrightarrow{AB} = 2\hat{\imath} + \hat{\jmath} - 2\hat{k}$ and $\overrightarrow{BC} = 6\hat{\imath} + 3\hat{\jmath} - 6\hat{k}$ then the points A, B, C are collinear.
4	The projection of the vector $2\hat{\imath} - \hat{\jmath} + \hat{k}$ on the vector $\hat{\imath} - 2\hat{\jmath} + \hat{k}$ is $\frac{4}{\sqrt{6}}$ unit.
5	$\vec{a}$ and $-\vec{a}$ are collinear.
6	Two collinear vectors are always equal in magnitudes.
7	Two vectors having same magnitude are collinear.
8	If for three non-zero vectors, $\vec{a}, \vec{b}, \vec{c}$, $[\vec{a}\vec{b}\vec{c}] = 0$ then the vectors are coplanar.
9	Two or more vectors are equal if they have same magnitude and direction.
10	For any non-zero vector $\vec{a}$, $\vec{a} = (\vec{a}\cdot\hat{\imath})\hat{\imath} + (\vec{a}\cdot\hat{\jmath})\hat{\jmath} + (\vec{a}\cdot\hat{k})\hat{k}$.
11	If two vectors have the same magnitude and direction regardless of the positions of their initial points, then they are unit vectors.
12	The value of $\hat{\imath}.(\hat{\jmath}\times\hat{k}) + \hat{\jmath}.(\hat{\imath}\times\hat{k}) + \hat{k}.(\hat{\imath}\times\hat{\jmath})$ is 1
13	If $\vec{a}, \vec{b}$ and $\vec{c}$ are unit vectors such that $\vec{a}+\vec{b}+\vec{c}=\vec{0}$, then the value of $\vec{a}.\vec{b}+\vec{b}.\vec{c}+\vec{c}.\vec{a} = -\frac{3}{2}$
14	If $\lvert\vec{a}\rvert = 10, \lvert\vec{b}\rvert = 2$ and $\vec{b}.\vec{a} = 12$, then the value of $\lvert\vec{b}\times\vec{a}\rvert = 16$
15	The vector $\lambda\hat{\imath} + \hat{\jmath} + 2\hat{k}, \hat{\imath} + \lambda\hat{\jmath} - \hat{k}$ and $2\hat{\imath} - \hat{\jmath} + \lambda\hat{k}$ are coplanar, if $\lambda = 0$
16	If $\lvert\vec{a}\rvert = 4$ and $-3 \le \lambda \le 2$, then the range of $\lvert\overrightarrow{\lambda a}\rvert = 12$
17	The number of vectors of unit length perpendicular to the vectors $\vec{a} = 2\hat{\imath} + \hat{\jmath} + 2\hat{k}$ and $\vec{b} = \hat{\jmath} + \hat{k}$ are two
18	If θ is the angle between two vectors $\vec{a}$ and $\vec{b}$, then $\vec{a}\cdot\vec{b} \ge 0$ only when $0 \le \theta \le \frac{\pi}{2}$.
19	For a given vector $\vec{a}$, the vector $\hat{a} = \frac{\vec{a}}{\lvert\vec{a}\rvert}$ gives the unit vector in the direction of $\vec{a}$
20	If $\vec{a} = \vec{b} + \vec{c}$ then always $\lvert\vec{a}\rvert = \lvert\vec{b}\rvert + \lvert\vec{c}\rvert$.
21	If $\theta = \frac{\pi}{2}$ then $\vec{a}\times\vec{b} = \lvert\vec{a}\rvert\lvert\vec{b}\rvert$.
22	$\vec{a}\times\vec{b}$ is a scalar.
23.	If $\lvert\vec{a}+\vec{b}\rvert = \lvert\vec{a}-\vec{b}\rvert$, then $\vec{a}$ and $\vec{b}$ are perpendicular. State true or false.

24	Direction cosines and direction ratios of a vector are always equal.
25	The direction cosines of $\vec{a}$ are unique but direction ratios of lines are not unique.
26	For any two vectors $\vec{a}$ and $\vec{b}$, $\|\vec{a}+\vec{b}\| > \|\vec{a}\|+\|\vec{b}\|$.
27	For any vector $\overrightarrow{AB}$, $\overrightarrow{AB} \neq \overrightarrow{BA}$ but $\|\overrightarrow{AB}\| = \|\overrightarrow{BA}\|$.
28	If two vectors are perpendicular to each other than vector product of the vectors is equal to zero.
29	For two vectors $\vec{a}$ and $\vec{b}$, $\vec{a} \times \vec{b} = \vec{b} \times \vec{a}$.
30	Direction of vector $\vec{a}x\vec{b}$ is perpendicular to the plane containing both vector $\vec{a}$ and vector $\vec{b}$
31	$\vec{a}$ and $\vec{b}$ represents Two adjacent sides of a triangle then its area is given by$\|\overrightarrow{a}x\vec{b}\|$
32	If $\|\vec{a}\|=\|\vec{b}\|$ then necessarily it implies $\vec{a}=\pm\vec{b}$
33	Position vector of a point $\vec{P}$ is a vector whose initial point is origin.
34	If $\vec{a}\ and\ \vec{b}$ are adjacent sides of a rhombus, then $\vec{a}.\vec{b}= 0$
35	For any non-zero vector $\vec{a}$, $\vec{a} = (\vec{a}\ .\hat{\imath})\hat{\imath} + (\vec{a}.\hat{\jmath})\hat{\jmath} + (\vec{a}\ .\hat{k})\hat{k}$.
36	If $\vec{a}X\vec{b} = \hat{\imath}+\hat{\jmath}+\hat{k}$ and $\|\vec{a}\|=2, \|\vec{b}\|= 1$, then angle between $\vec{a}\ and\ \vec{b}$is 60^0.
37	If $\vec{a}\ and\ \vec{b}$ are unit vectors, then $\vec{a}.\vec{b}$ can be $\sqrt{3}$.
38	For any two non-zero vector $\vec{a}\ and\ \vec{b}$, $\|\vec{a}\|\vec{b} + \|\vec{b}\|\vec{a}$is parallel to $\|\vec{a}\|\vec{b} - \|\vec{b}\|\vec{a}$.
39	For vector $\vec{a}\ and\ \vec{b}$; $\vec{a}.\vec{b} = 0 \Leftrightarrow \vec{a} = \vec{0}, \vec{b} = \vec{0}$ or $\vec{a} = \vec{b}$.
40	For a scalar$\lambda(\vec{a}X\vec{b})=(\overrightarrow{\lambda a}X\vec{b})=(\vec{a}X\lambda\vec{b})$,where $\vec{a}\ and\ \vec{b}$ are given vectors.
41	If we want to show that two non-zero vectors $\vec{a}\ and\ \vec{b}$ are parallel, then we should show that $\vec{a}.\vec{b}=0$.
42	The value of $(\hat{\imath} \times \hat{\jmath}).\hat{k} + (\hat{\jmath} \times \hat{k}).\hat{\imath} = 2$
43	The value of p =$\frac{2}{3}$for which $\vec{a} = 3\hat{\imath} + 2\hat{\jmath} + 9\hat{k}$ and $\vec{b} = \hat{\imath} + p\hat{\jmath} + 3\hat{k}$ are parallel vectors
44	If θ is the angle between two vectors $\hat{\imath} - 2\hat{\jmath} + 3\hat{k}\ and\ 3\hat{\imath} - 2\hat{\jmath} + \hat{k}$ than $sin\ sin\ \theta = \frac{2\sqrt{6}}{7}$
45	If X.A=0,X.B=0,X.C=0 for some non-zero vector Then $[ABC]$ =0
46	The value of the expression $\left\|\vec{a} \times \vec{b}\right\|^2 + \left(\vec{a}.\vec{b}\right)^2 = \|\vec{a}\|^2.\left\|\vec{b}\right\|^2$.
47	The area of triangle whose adjacent sides are $3\hat{\imath} + \hat{\jmath} + 4\hat{k}$ and $\hat{\imath} - \hat{\jmath} + \hat{k}$ is 42.

48	The projection of $2\hat{\imath} - \hat{\jmath} + \hat{k}$ on $\hat{\imath} - 2\hat{\jmath} + \hat{k}$ is $\frac{5}{\sqrt{6}}$.
49	If $(\vec{a} + \vec{b}).(\vec{a} - \vec{b}) = 0$ then $\|\vec{a}\| = \|\vec{b}\|$.
50	If $\|\vec{a} \times \vec{b}\|^2 + (\vec{a}.\vec{b})^2 = 144$ and $\|\vec{a}\| = 4$, $then \|\vec{b}\| = 8$.
51	A vector quantity has only magnitude.
52	A scalar quantity has only magnitude.

ANSWERS

True False Questions	
Q.No.	Answer
1	false
2	true
3	true
4	false
5	true
6	false
7	false
8	true
9	false
10	True
11	false
12	true
13	true
14	true
15	false
16	true
17	true
18	T
19	T
20	F
21	T
22	F
23	True
24	False
25	True
26.	False
27.	True
28.	False
29.	False
30	T
31	F
32	T

33	T
34	F
35	T
36	T
37	F
38	F
39	F
40	T
41	F
42	True
43	True
44	True
45	True
46	True
47	False
48	True
49	True
50	False
51	False
52	True

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