Name: _____	**Subject:** Mathematics	**Class:** 12th	**Time:** 80 minutes	Total Marks:	**40**
Chapter No.07	**MJDexpert.com**			Obtained marks	

Note: Please attempt any 10 short questions from Question 2. Also, attempt both parts of Question 3. Cutting and removal of any content is strictly prohibited.

Question No 01:- Choose the Right Answer.

(10x1=10)

i.	**The scalar quantity is the following is**	**Force**	**Displacement**	**Velocity**	**Temperature**
ii.	**A physical quantity that can be specified by a number along with unit is called a**	**Scalar**	**vector**	**constant**	**Variable**
iii.	**If α, β, γ are the direction cosines of a vector then $\cos^2\alpha + \cos^2\beta + \cos^2\gamma =$**	**3**	**2**	**1**	**0**
iv.	**The vector lying in the same plane are called:**	**Collinear vector**	**Perpendicular vectors**	**Coplanar vector**	**Parallel vector**
v.	**Zero vector is perpendicular to**	**Every vector**	**Unit vector only**	**Position vector only**	**Not any vector**
vi.	**The non – zero vectors $\underline{a}$ and $\underline{b}$ are parallel if $\underline{a} \times \underline{b} =$**	**-1**	**1**	**0**	**ab**
vii.	**Volume of parallelepiped with $\underline{u}, \underline{v}, \underline{w}$ are its co – terminal edges is**	$\underline{u} \times \underline{v} . \underline{w}$	$\frac{1}{3}(\underline{u} \times \underline{v} . \underline{w})$	$\frac{1}{6}(\underline{u} \times \underline{v} . \underline{w})$	$\frac{1}{2}(\underline{u} \times \underline{v} . \underline{w})$
viii.	**Vectors $\underline{v} = 2\alpha\underline{i} + \underline{j} - \underline{k}, \underline{v} = \underline{i} + \alpha\underline{j} + 4\underline{k}$ are perpendicular then $\alpha =$**	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{4}{3}$	**3**
ix.	**Direction cosines of vector is $2\underline{i} + 3\underline{j} + 4\underline{k}$**	$\frac{2}{\sqrt{29}}, \frac{3}{\sqrt{29}}, \frac{4}{\sqrt{29}}$	$\frac{1}{\sqrt{29}}, \frac{3}{\sqrt{29}}, \frac{4}{\sqrt{29}}$	$\frac{2}{\sqrt{29}}, \frac{5}{\sqrt{29}}, \frac{6}{\sqrt{29}}$	**None**
x.	$2\underline{i} \times 2\underline{j} . \underline{k} =$	**-4**	**4**	**1**	**0**

Question No.01:- Attempt all parts: **(02x10=20)**

i.	The position vector of the points A,B,C and D are $2\underline{i} - \underline{j} + \underline{k}$, $3\underline{i} + \underline{j}$, $2\underline{i} + 4\underline{j} - 2\underline{k}$, $-\underline{i} - 2\underline{j} + \underline{k}$ respectively. Show that $\overrightarrow{AB}$ is parallel to $\overrightarrow{CD}$.
ii.	Find the cosine of the angle between $\underline{u}$ and $\underline{v}$ $3\underline{i} + \underline{j} - \underline{k}$, $2\underline{i} - \underline{j} + \underline{k}$.
iii.	If $\underline{a} + \underline{b} + \underline{c} = 0$ then prove that $\underline{a} \times \underline{b} = \underline{b} \times \underline{c} = \underline{c} \times \underline{a}$
iv.	Find α , so that $\left\|\alpha\underline{i} + (\alpha + 1)\underline{j} + 2\underline{k}\right\| = 3$
v.	Prove that $\underline{a} \times (\underline{b} + \underline{c}) + \underline{b} \times (\underline{c} + \underline{a}) + \underline{c} \times (\underline{a} + \underline{b}) = 0$
vi.	Find a vector of magnitude 4 and parallel to $2\underline{i} - 3\underline{j} + 6\underline{k}$.
vii.	Find α so that the vectors $\underline{u} = \alpha\underline{i} + 2\alpha\underline{j} - \underline{k}$, $\underline{v} = \underline{i} + \alpha\underline{j} + 3\underline{k}$ are perpendicular.
viii.	Find the constant α such that the vectors are coplanar $\underline{i} - \underline{j} + \underline{k}$, $\underline{i} - 2\underline{j} - 3\underline{k}$, $3\underline{i} - \alpha\underline{j} + 5\underline{k}$
ix.	Find a vector from point A to the origin where $\overrightarrow{AB} = 4\underline{i} - 2\underline{j}$ and B is (-2 , 5).
x.	Prove that the vector $\underline{i} - 2\underline{j} + 3\underline{k}$, $-2\underline{i} + 3\underline{j} - 4\underline{k}$, $\underline{i} - 3\underline{j} + 5\underline{k}$ are coplanar.

Question.No.02:-Attempt all questions: **(02x05=10)**

a.	Prove that $\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$
b.	Find the area of parallelogram whose sides vertices is A (0, 0, 0), B(1, 2, 3), C(2, -1, 1), D (3, 1, 4)