Chapter 01

Basic Mathematics

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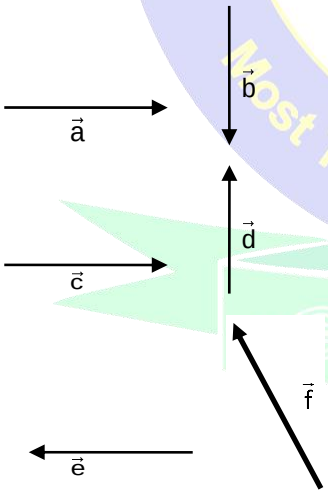
Q.1 The vectors $\vec{A}$ and $\vec{B}$ are such that :
$|\vec{A}+\vec{B}| = |\vec{A}-\vec{B}|$
The angle between the two vectors is :
[AIPMT 2006]
(1) 90° (2) 60° (3) 75° (4) 45°

Q.2 If $|\vec{A}\times\vec{B}| = \sqrt{3}\vec{A}.\vec{B}$, then the value of $|\vec{A}+\vec{B}|$ is:
[AIPMT 2007]
(1) $(A^2 + B^2 + AB)^{1/2}$ (2) $\left(A^2+B^2+\frac{AB}{\sqrt{3}}\right)^{1/2}$
(3) A + B (4) $(A^2+B^2+AB)^{1/2}$

Q.3 Six vectors, $\vec{a}$ through $\vec{f}$ have the magnitudes and directions indicated in the figure. Which of the following statements is true ?
[AIPMT 2010]

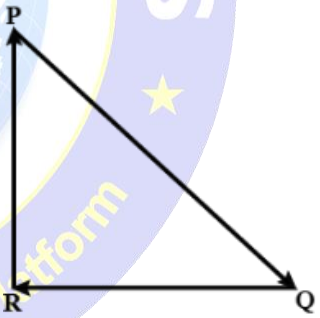


(1) $\vec{b}+\vec{c}+\vec{f}$ (2) $\vec{d}+\vec{c}=\vec{f}$
(3) $\vec{b}+\vec{e}=\vec{f}$ (4) $\vec{d}+\vec{e}=\vec{f}$

Q.4 If vectors $\vec{A}=\cos\omega t\hat{i}+\sin\omega t\hat{j}$ and $\vec{B}=\cos\frac{\omega t}{2}\hat{i}+\sin\frac{\omega t}{2}\hat{j}$ are functions of time, then the value of t at which they are orthogonal to each other is: **[Re- AIPMT 2015]**
(1) t = 0 (2) $t=\frac{\pi}{4\omega}$ (3) $t=\frac{\pi}{2\omega}$ (4) $t=\frac{\pi}{\omega}$

Q.5 If the magnitude of sum of two vectors is equal to the magnitude of difference of the two vectors, the angle between these vectors is :
[AIPMT 2016]
(1) 0° (2) 90° (3) 45° (4) 180°

Q.6 A particle moving with velocity $\vec{V}$ is acted by three forces shown by the vector triangle PQR. The velocity of the particle will:
[NEET(UG) 2019]

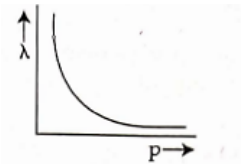


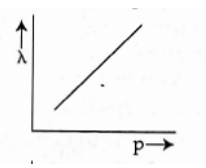
(1) increase
(2) decrease
(3) remain constant
(4) change according to the smallest force $\overrightarrow{OR}$

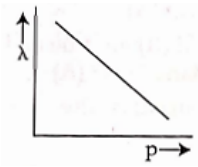
Q.7 Find the torque about the origin when a force of $3\hat{j}$ N acts on a particle whose position vector is $2\hat{k}$ m: **[NEET 2020]**
(1) $6\hat{k}$ N m (2) $6\hat{i}$ N m
(3) $6\hat{j}$ N m (4) $-6\hat{i}$ N m

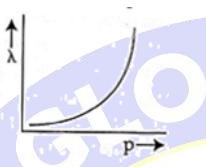
Q.8 The angle of 1' (minute of arc) in radian is nearly equal to **[NEET 2020]**
(1) 2.91×10^{-4} rad (2) 4.85×10^{-4} rad
(3) 4.80×10^{-6} rad (4) 1.75×10^{-2} rad

Q.9 The graph which shows the variation of the de Broglie wavelength (λ) of a particle and its associated momentum (p) is: **[NEET 2022]**

(1) 

(2) 

(3) 

(4) 

ANSWER KEY

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Que.	1	2	3	4	5	6	7	8	9
Ans.	1	4	4	4	2	3	4	1	1