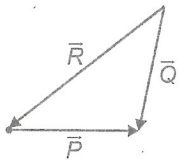
PHYSICS

Section A

1. The vector quantity among the following is
   (1) Mass (2) Time.
   (3) Distance (4) Displacement

2. The maximum number of rectangular components in which a vector can be resolved in a plane, is
   (1) Infinite (2) Four
   (3) Two (4) One

3. The correct relation between vectors $\vec{P}, \vec{Q}$ and $\vec{R}$ and is



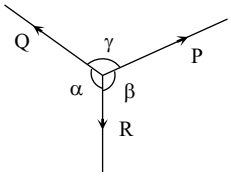
   (1) $\vec{P}+\vec{Q}=\vec{R}$ (2) $\vec{Q}+\vec{R}=\vec{P}$
   (3) $\vec{Q}=\vec{R}+\vec{P}$ (4) $\vec{P}+\vec{Q}+\vec{R}=0$

4. If $|\vec{A}\times\vec{B}|=|\vec{A}.\vec{B}|$, then angle between $\vec{A}$ and $\vec{B}$ will be
   (1) 30° (2) 45°
   (3) 60° (4) 90°

5. The angle between vectors $(\vec{A}\times\vec{B})$ and $(\vec{B}\times\vec{A})$ is
   (1) Zero (2) π
   (3) $\pi/4$ (4) $\pi/2$

6. Angle (in rad) made by the vector $\sqrt{3}\hat{i}+\hat{j}$ with the x-axis is
   (1) $\frac{\pi}{6}$ (2) $\frac{\pi}{4}$
   (3) $\frac{\pi}{3}$ (4) $\frac{\pi}{2}$

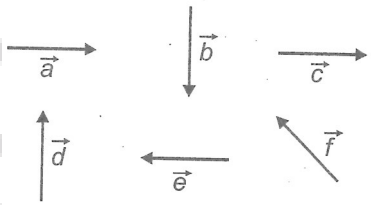
7. A body is in equilibrium under the action of three coplanar forces P, Q and R as shown in the figure. Select the correct statement



   (1) $\frac{P}{\sin\alpha}=\frac{Q}{\sin\beta}=\frac{R}{\sin\gamma}$
   (2) $\frac{P}{\cos\alpha}=\frac{Q}{\cos\beta}=\frac{R}{\cos\gamma}$
   (3) $\frac{P}{\tan\alpha}=\frac{Q}{\tan\beta}=\frac{R}{\tan\gamma}$
   (4) $\frac{P}{\sin\beta}=\frac{Q}{\sin\gamma}=\frac{R}{\sin\alpha}$

8. For two vectors A and B, $|A+B|=|A-B|$, then angle between $\vec{A}$ and $\vec{B}$
   (1) 0 (2) 30
   (3) 45 (4) 90

9. Six vectors, $\vec{a}$ to $\vec{f}$ have the magnitudes and directions indicated in the figure. Which of the following statements is true?



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

10. Which of the following pairs of vectors are parallel?
    (1) $\vec{A}=\hat{i}-2\hat{j};\vec{B}=\hat{i}-5\hat{j}$
    (2) $\vec{A}=\hat{i}-10\hat{j};\vec{B}=2\hat{i}-5\hat{j}$
    (3) $\vec{A}=\hat{i}-5\hat{j};\vec{B}=\hat{i}-10\hat{j}$
    (4) $\vec{A}=\hat{i}-5\hat{j};\vec{B}=2\hat{i}-10\hat{j}$

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