Daily Practice Problems-04

Q1. The angle between the vectors $\vec{A}$ and $\vec{B}$ is θ. The value of the triple product $\vec{A}.(\vec{B}\times\vec{A})$ is

a. $A^2\,B$

b. Zero

c. $A^2\,B\,sin\theta$

d. $A^2\,B\,cos\theta$

Q2. If $\vec{A}\times\vec{B}=\vec{B}\times\vec{A}$ then the angle between A and B is

a. p / 2

b. p / 3

c. p

d. p / 4

Q3. If $\vec{A}=3\hat{\imath}+\hat{\jmath}+2\hat{k}$ and $\vec{B}=2\hat{\imath}-2\hat{\jmath}+4\hat{k}$ then value of $|\vec{A}\times\vec{B}|$ will be

a. $8\sqrt{2}$

b. $8\sqrt{3}$

c. $8\sqrt{5}$

d. $5\sqrt{8}$

Q4. The torque of the force $\vec{F}=(2\hat{\imath}-3\hat{\jmath}+4\hat{k})$N acting at the point $\vec{r}=(3\hat{\imath}+2\hat{\jmath}+3\hat{k})$m about the origin be

a. $6\hat{\imath}-6\hat{\jmath}+12\hat{k}$

b. $17\hat{\imath}-6\hat{\jmath}-13\hat{k}$

c. $-6\hat{\imath}+6\hat{\jmath}-12\hat{k}$

d. $-17\hat{\imath}+6\hat{\jmath}+13\hat{k}$

Q5. If $\vec{A}\times\vec{B}=\vec{C}$, then which of the following statements is wrong

a. $\vec{C}\perp\vec{A}$

b. $\vec{C}\perp\vec{B}$

c. $\vec{C}\perp(\vec{A}+\vec{B})$

d. $\vec{C}\perp(\vec{A}\times\vec{B})$

Q6. If a particle of mass m is moving with constant velocity v parallel to x-axis in x-y plane as shown in fig. Its angular momentum with respect to origin at any time t will be

a. $mvb\hat{k}$

b. $-mvb\hat{k}$

c. $mvb\hat{\imath}$

d. $mv\hat{\imath}$

Q7. A vector $\vec{F}_1$ is along the positive X-axis. If its vector product with another vector $\vec{F}_2$ is zero then $\vec{F}_2$ could be

a. $4\hat{j}$

b. $-(\hat{\imath}+\hat{j})$

c. $(\hat{j}+\hat{k})$

d. $(-4\hat{\imath})$

Q8. The resultant of the two vectors having magnitude 2 and 3 is 1. What is their cross product

a. 6

b. 3

c. 1

d. 0

Q9. The angle between two vectors given by $6\vec{\imath}+6\vec{j}-3\vec{k}$ and $7\vec{\imath}+4\vec{j}+4\vec{k}$ is

a. $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$

b. $\cos^{-1}\left(\frac{5}{\sqrt{3}}\right)$

c. $\sin^{-1}\left(\frac{2}{\sqrt{3}}\right)$

d. $\sin^{-1}\left(\frac{\sqrt{5}}{3}\right)$

Q10. The value of $(\vec{A}+\vec{B})\times(\vec{A}-\vec{B})$ is

a. 0

b. A^2-B^2

c. $\vec{B}\times\vec{A}$

d. $2(\vec{B}\times\vec{A})$

Q11. The position vectors of radius are $2\hat{\imath}+\hat{j}+\hat{k}$ and $2\hat{\imath}-3\hat{j}+\hat{k}$ while those of linear momentum are $2\hat{\imath}+3\hat{j}-\hat{k}$. Then the angular momentum is

a. $2\hat{\imath}-4\hat{k}$

b. $4\hat{\imath}-8\hat{k}$

c. $2\hat{\imath}-4\hat{j}+2\hat{k}$

d. $4\hat{\imath}-8\hat{k}$

Q12. If $\left|\vec{A}\times\vec{B}\right|=\sqrt{3}\vec{A}.\vec{B}$, then the value of $|\vec{A}+\vec{B}|$ is

a. $\left(A^2+B^2+\frac{AB}{\sqrt{3}}\right)^{\frac{1}{2}}$

b. $A+B$

c. $\left(A^2+B^2+\sqrt{3}AB\right)^{\frac{1}{2}}$

d. $(A^2+B^2+AB)^{\frac{1}{2}}$

Q13. If a vector $\vec{A}$ is parallel to another vector $\vec{B}$ then the resultant of the vector $\vec{A}\times\vec{B}$ will be equal to

a. A

b. $\vec{A}$

c. Zero vector

d. Zero

ANSWERS

1. b
2. c
3. b
4. b
5. d
6. b
7. d
8. d
9. d
10. d
11. b
12. d
13. c