1. Which of the following is not true if $\overrightarrow{A}=3\hat{i}+4\hat{j}$ and $\overrightarrow{B}=6\hat{i}+8\hat{j}$, where A & B are the magnitudes of $\overrightarrow{A}$ and $\overrightarrow{B}$?

(1) $\overrightarrow{A}\times\overrightarrow{B}=0$
(2) $\frac{A}{B}=\frac{1}{2}$
(3) $\overrightarrow{A}\cdot\overrightarrow{B}=48$
(4) $A=5$

2. A unit vector perpendicular to the plane of $\overrightarrow{a}=2\hat{i}-6\hat{j}-3\hat{k}$ and $\overrightarrow{b}=4\hat{i}+3\hat{j}-\hat{k}$ is

(1) $\frac{4\hat{i}+3\hat{j}-\hat{k}}{\sqrt{26}}$
(2) $\frac{2\hat{i}-6\hat{j}-3\hat{k}}{7}$
(3) $\frac{3\hat{i}-2\hat{j}+6\hat{k}}{7}$
(4) $\frac{2\hat{i}-3\hat{j}-6\hat{k}}{7}$

3. Let $\overrightarrow{a}=2\hat{i}+\lambda_1\hat{j}+3\hat{k}$, $\overrightarrow{b}=4\hat{i}+(3-\lambda_2)\hat{j}+6\hat{k}$ and $\overrightarrow{c}=3\hat{i}+6\hat{j}+(\lambda_3-1)\hat{k}$ be three vectors such that $\overrightarrow{b}=2\overrightarrow{a}$ and $\overrightarrow{a}$ is perpendicular to $\overrightarrow{c}$. Then a possible value of $(\lambda_1, \lambda_2, \lambda_3)$ is

(1) $\left(-\frac{1}{2}, 4, 0\right)$
(2) $(1,5,1)$
(3) $\left(\frac{1}{2}, 4, -2\right)$
(4) $(1,3,1)$

4. If $\overrightarrow{a}$, $\overrightarrow{b}$, and $\overrightarrow{c}$ are unit vectors such that $\overrightarrow{a}+2\overrightarrow{b}+2\overrightarrow{c}=\overrightarrow{0}$, then $\left|\overrightarrow{a}\times\overrightarrow{c}\right|$ equals

(1) $\frac{1}{4}$
(2) $\frac{\sqrt{15}}{16}$
(3) $\frac{15}{16}$
(4) $\frac{\sqrt{15}}{4}$

5. If $\left|\overrightarrow{a}\times\overrightarrow{b}\right|^2+\left|\overrightarrow{a}\cdot\overrightarrow{b}\right|^2=144$ and $\left|\overrightarrow{a}\right|=4$ then $\left|\overrightarrow{b}\right|$ is equal to

(1) 12
(2) 3
(3) 8
(4) 4

6. The area of a parallelogram whose adjacent sides are given by the vectors $\hat{i}+2\hat{j}+3\hat{k}$ and $-3\hat{i}-2\hat{j}+\hat{k}$ (in square unit) is

(1) $\sqrt{180}$
(2) $\sqrt{140}$
(3) $\sqrt{80}$
(4) $\sqrt{40}$

7. The area of the parallelogram whose diagonals are the vectors $2\overrightarrow{a}-\overrightarrow{b}$ and $4\overrightarrow{a}-5\overrightarrow{b}$, where $\overrightarrow{a}$ and $\overrightarrow{b}$ are the unit vectors forming an angle of 45^o, is

(1) $3\sqrt{2}$
(2) $\frac{3}{\sqrt{2}}$
(3) $\sqrt{2}$
(4) None of these

8. Let $\overrightarrow{a}$ and $\overrightarrow{c}$ are unit vectors and $\left|\overrightarrow{b}\right|=4$ with $\overrightarrow{a}\times\overrightarrow{b}=2\overrightarrow{a}\times\overrightarrow{c}$. The angle between $\overrightarrow{a}$ and $\overrightarrow{c}$ is $\cos^{-1}\left(\frac{1}{4}\right)$. If $\overrightarrow{b}-2\overrightarrow{c}=\lambda\overrightarrow{a}$, then λ is equal to

(1) $\frac{1}{3}, \frac{1}{2}$
(2) $\frac{2}{3}, \frac{1}{3}$
(3) 3, -4
(4) 2, 3

9. Let $\overrightarrow{a}$, $\overrightarrow{b}$ and $\overrightarrow{c}$ be three vectors such that $\left|\overrightarrow{a}\right|=\sqrt{3}$, $\left|\overrightarrow{b}\right|=5$, $\overrightarrow{b}\bullet\overrightarrow{c}=10$ and the angle between $\overrightarrow{b}$ and $\overrightarrow{c}$ is $\frac{\pi}{3}$. If $\overrightarrow{a}$ is perpendicular to the vector $\overrightarrow{b}\times\overrightarrow{c}$, then $\left|\overrightarrow{a}\times\left(\overrightarrow{b}\times\overrightarrow{c}\right)\right|$ is equal to ___________.

10. Let $\overrightarrow{a}=\hat{i}-2\hat{j}+\hat{k}$ and $\overrightarrow{b}=\hat{i}-\hat{j}+\hat{k}$, be two vectors. If $\overrightarrow{c}$, is a vector such that $\overrightarrow{b}\times\overrightarrow{c}=\overrightarrow{b}\times\overrightarrow{a}$ and $\overrightarrow{c}\cdot\overrightarrow{a}=0$, then $\overrightarrow{c}\cdot\overrightarrow{b}$, is equal to.

(1) $-\frac{3}{2}$
(2) $\frac{1}{2}$
(3) $-\frac{1}{2}$
(4) -1