Question I: Circle the correct answer
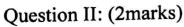
1] The focus of the parabola $y^2 = 8(x-3)$ is
a) $(5,0)$ b) $(1,0)$ c) $(0,1)$.

2] The directrix of $5x^2 + 8y = 0$ is
a) $y = \frac{2}{5}$ b) $x = \frac{2}{5}$ c) $y = -\frac{2}{5}$.

3] Asymptotes of the hyperbola $\frac{x^2}{9} - \frac{y^2}{4} = 1$ are
a) $y = \pm\frac{2}{3}x$ b) $y = \pm\frac{3}{2}x$ c) $x = \pm\frac{2}{3}y$.

4] In the ellipse $\frac{x^2}{9} + \frac{y^2}{16} = 1$, the length of the minor axis is
a) 3   b) 8   c) 6.

5] $\vec{a}$ and $\vec{b}$ are parallel iff
a) $\vec{a} \cdot \vec{b} = 0$ b) $\vec{a} \times \vec{b} = \vec{0}$ c) $|\vec{a}| = |\vec{b}|$.

6] The meaningfull statement is
a) $\left(\vec{a} \cdot \vec{b}\right) + \vec{c}$ b) $|\vec{a}|\left(\vec{b} \cdot \vec{c}\right)$ c) $|\vec{a}| \cdot \left(\vec{b} + \vec{c}\right)$.

7] The angle between $\vec{a} = -i + 2j + 5k$, $\vec{b} = 3i + 4j - k$ is
a) zero   b) $\frac{\pi}{2}$ c) π.

8]- If $\vec{a} = 3i - 4j$, $\vec{b} = 5i$, then the scalar projection of $\vec{b}$ onto $\vec{a}$ is
a) 3   b) $-\frac{11}{5}$ c) $\frac{11}{5}$.
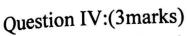
9] The distance from the point $(1,-2,4)$ and the plane $3x + 2y + 6z = 5$ is
a) $\frac{18}{7}$ b) $\frac{28}{7}$ c) $\frac{36}{7}$.

10] The volume of the parallelpiped determined by $\vec{a} = \langle 1,1,-1 \rangle$, $\vec{b} = \langle 1,-1,1 \rangle$, $\vec{c} = \langle -1,1,1 \rangle$ is
a) 0   b) 4   c) 6.

Question II: (2marks)

Find the values of x such that the vectors $\langle 3,2,x \rangle$ and $\langle 2x,4,x \rangle$ are orthognal.

Question III:(3marks)

Find the parametric equations of the line through $(1,0,-1)$ and parallel to the line

$$\frac{x-4}{3} = \frac{y}{2} = z + 2.$$

Question IV:(3marks)

Find the equation of the plane through the points $P(0,1,0)$ and $Q(1,0,1)$ and $R(1,1,0)$.

Question V:(3 marks)

Find the equation of the hyperbola where one of the vertices is at $(0,2)$ and the asymptotes are $y-2 = \pm\frac{2}{3}(x-3)$ and sketch the graph.