

(4)

5. (a) Find the ratio in which the line segment joining $(-2, -3)$ and $(5, 4)$ is divided by X -axis. 2

(b) If $\cos^{-1} x + \cos^{-1} y + \cos^{-1} z = \pi$, prove that

$$x^2 + y^2 + z^2 + 2xyz = 1 \quad 5$$

(c) Prove that by vector method in any triangle

ABC

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \quad 7$$

6. (a) Find the centre and radius of the circle

$$x^2 + y^2 - x - y - z = 0 \quad 2$$

(5)

(b) In any triangle ABC , prove that

$$\tan \frac{B-C}{2} = \frac{b-c}{b+c} \cot \frac{A}{2} \quad 5$$

(c) Find the distance of the point $(-1, -2)$ from

the line $x + 3y - 7 = 0$ measured parallel to

the line $3x + 2y - 5 = 0$. 7

7. (a) If $\sin \alpha = \frac{1}{2}$, $\sin \beta = \frac{1}{3}$, then find the value of $\sin(\alpha + \beta)$. 2

(b) Prove that

$$\begin{vmatrix} a & b & c \\ a^2 & b^2 & c^2 \\ bc & ca & ab \end{vmatrix} = (a-b)(b-c)(c-a)(ab+bc+ca) \quad 5$$