

HERAMB COACHING CLASSES**XI/ MATHS****Marks: 30****Duration: 1Hr****Date: 02/12/17**

ATTEMPT ANY SIX OF THE FOLLOWING:

1. Prove that $\begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix} = abc + 2fgh - af^2 - bg^2 - ch^2$

2. Show that $\begin{vmatrix} i & -2i & 1 \\ 3i & 1 & 2 \\ 1 & -3 & i \end{vmatrix} = -2 - 13i$ where $i = \sqrt{-1}$

3. Prove that $\begin{vmatrix} a & a & a \\ a & b & b \\ a & b & c \end{vmatrix} = a(b-c)(a-b)$. hence find the value of $\begin{vmatrix} 3 & 3 & 3 \\ 3 & 5 & 5 \\ 3 & 5 & 7 \end{vmatrix}$

4. solve the following equation for x, y and z if,

$$\sin x + \cos y + \tan z = 3$$

$$2 \sin x + \cos y + \tan z = 4 \text{ and}$$

$$3 \sin x + 4 \cos y - 2 \tan z = 5 \text{ where } 0 \leq x, y, z \leq 90^\circ$$

5. If $l = \frac{y-1}{x}$, $m = \frac{1-x}{y}$ and $n = x - y$ are consistent equations in x and y then show that $l + m + n + lmn = 0$

6. If equations $ax+by+c=0$, $cx+ay+b=0$ and $bx+cy+a=0$ are consistent in x and y , then show that $a^3+b^3+c^3=3abc$.

7. Find k , if the area of the triangle with vertices $A(k, 3), B(-5, 7), C(-1, 4)$ is 4 sq. units.

8. Find the equation of the line joining the points $P(2, -3)$ and $Q(-4, 1)$ using determinants.