Professor Vishwanathan Iyer's

HERAMB COACHING CLASSES

ATTEMPT ANY 5: (5 marks each)

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

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

3) Prove that

$$\begin{vmatrix} a & a & a \\ a & b & b \\ a & b & c \end{vmatrix} = a(b - c)(a - b).$$

4) Find the value of x, if

$$\begin{vmatrix} 0 & -3 & x \\ x+1 & 3 & 1 \\ 4 & 1 & 5 \end{vmatrix} = 0$$

5) Without expanding the determinants, show that

$$\begin{vmatrix} lp & mq & nr \\ p^2 & q^2 & r^2 \\ 1 & 1 & 1 \end{vmatrix} = \begin{vmatrix} l & m & n \\ p & q & r \\ qr & pr & pq \end{vmatrix}$$

6) Without expanding the determinants, show that

$$\begin{vmatrix} a^2 + 2ab & a & 1 \\ 3b^2 & b & 1 \\ c^2 + 2bc & c & 1 \end{vmatrix} = \begin{vmatrix} a^2 & a & 1 \\ b^2 & b & 1 \\ c^2 & c & 1 \end{vmatrix}$$

7) Show that

$$\begin{vmatrix} 1 & 1 & 1 \\ x^2 & y^2 & z^2 \\ x^3 & y^3 & z^3 \end{vmatrix} = (x - y)(y - z)(z - x)(xy + yz + zx)$$

8) Find by inspection, two values of x, if

$$\begin{vmatrix} 1 & 9 & 36 \\ 2 & 3 & 2 \\ 1 & 3x & 4x^2 \end{vmatrix} = 0.$$

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