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**MM 25**

**Determinants**

**Time 1 hour**

**CherrySection A 1 Mark Each**

**Paper prepared by**

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1. If  $\begin{vmatrix} x+2 & 3 \\ x+5 & 4 \end{vmatrix} = 3$ , Find the value of x.

2. Find the value (s) of p, such that the area of the triangle with vertices (5, 4), (-2, 6) and (p, 4) is 35 square units.

3. Find the cofactor of  $a_{12}$  in the following:  $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$

**Section B 4 Marks Each**

4. Prove that  $\begin{vmatrix} x+a & b & c \\ a & x+b & c \\ a & b & x+c \end{vmatrix} = x^2(x+a+b+c)$

5. Using properties of determinants, Show that:  $\begin{vmatrix} 1 & a & a^2 - bc \\ 1 & b & b^2 - ca \\ 1 & c & c^2 - ab \end{vmatrix} = 0$

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6. If  $A = \begin{bmatrix} 3 & 2 \\ 7 & 5 \end{bmatrix}$ ,  $B = \begin{bmatrix} 6 & 7 \\ 8 & 9 \end{bmatrix}$  verify that  $(AB)^{-1} = B^{-1}A^{-1}$

7. If  $f(x) = \begin{bmatrix} \cos x & -\sin x & 0 \\ \sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$  Show that  $\{f(x)\}^{-1} = f(-x)$ .

**Section C 6 Marks Each**

10. solve using matrices:  $\frac{2}{a} + \frac{3}{b} + \frac{10}{c} = 4$ ;  $\frac{4}{a} - \frac{6}{b} + \frac{5}{c} = 1$ ,  $\frac{6}{a} + \frac{9}{b} - \frac{20}{c} = 2$ .

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