CLASS XII
GUESS PAPER
MATHS

DETERMINANT AND MATRICES

Time: - 1 ½ hrs ***F.M.: - 50***

1) ***Answer all questions.*** **[5×2 =10]**

a) *For what value of λ the system of linear equations x + y + z = 6 , 4x + λy - λz = 0, 3x + 2y – 4z = -5 do not possesses a solution.*

b) *If every element of a third orders matrix of determinant value is multiplied by 5, then what is the value of the value of the new determinant?*

c) : Find $\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$ = _____. d) The minimum value of $\begin{vmatrix} \sin x & \cos x \\ -\cos x & 1+\sin x \end{vmatrix}$ is ___.

e) If A is a square matrix of order 3 such that $|AdjA| = 64$, then find $|A| = ?$

2) ***Answer all questions.*** **[4×5=20]**

a) Evaluate $\begin{vmatrix} a^2+1 & ab & ac \\ ab & b^2+1 & bc \\ ac & bc & c^2+1 \end{vmatrix} = 1 + a^2 + b^2 + c^2.$ b) Find B if $B^2 = \begin{bmatrix} 17 & 8 \\ 8 & 17 \end{bmatrix}$

c) Prove that $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc\left(1+\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right)$

d) *Solve by Crammer's Rule: x – y + z = 4, 2x + y – 3z = 0, x + y + z = 2.*

3) ***Answer any FOUR questions.*** **[4×5=20]**

a) If $A = \begin{bmatrix} 3 & 2 & 1 \\ 4 & -1 & 2 \\ 7 & 3 & -3 \end{bmatrix}$ find A^{-1} and hence solve the system of linear equations

$3x + 4y + 7z = 14, 2x - y + 3z = 4, x + 2y - 3z = 0.$

b) Show that the following system of linear equations are consistent and solve by matrix method : $5x+3y+7z=4, 3x+26y+2z=9, 7x+2y+10z=5$.

c) For the matrix $A=\begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$, find x and y so that $A^2 + xI = yA$. Hence find A^{-1}.

d) If a,b,c are distinct real numbers and the system of linear equations
$ax+a^2y+(a^3+1)z=0, bx+b^2y+(b^3+1)z=0, cx+c^2y+(c^3+1)z=0$
has a non-trivial solution, show that $abc=-1$.

e) If a,b,c are all positive and p^{th}, q^{th}, r^{th} terms of a GP, then prove that : $\begin{vmatrix} \log a & p & 1 \\ \log b & q & 1 \\ \log c & r & 1 \end{vmatrix} = 0$

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