SHIKSHA CLASSES

Subject : Maths - I | **Question Paper** | **Total Marks :25**

Class : XI | **4 : Determinants and Matrices** | **Time : 1 Hour**

SECTION - A

Q.1 : Choose the correct option : 4

i) By solving the following equation $x+y+z=6$, $x-y+z=2$, $x+2y-z=2$ we get the value of x is

a) 1 b) 2 c) 3 d) 4

ii) The determinant $D=\begin{vmatrix} a & b & a+b \\ b & c & b+c \\ a+b & b+c & 0 \end{vmatrix}=0$ if

a) a,b, c are in A.P. b) a, b, c are in G.P.

c) a, b, c are in H.P. d) α is root of $ax^2+2bx+c=0$

Q.2 : Solve the following questions: 2

i)If $A=\begin{bmatrix} -1 & 5 \\ 3 & -2 \\ 4 & 7 \end{bmatrix}$ and $k=\frac{3}{2}$, then kA=?

ii) If $A=[a_{11}\ a_{12}\ a_{13}]$ and $B=\begin{bmatrix} b_{11} \\ b_{21} \\ b_{31} \end{bmatrix}$ Find AB.

SECTION B

: Solve the following : (ANY 3) 6

Q.3 : Find x and y if $\begin{vmatrix} 4i & i^3 & 2i \\ 4 & 3i^2 & 4 \\ 20 & -3 & i \end{vmatrix}$ $x+iy$

where $i^2=-1$

Q.4 : Without expanding determinants,show that :

$$\begin{vmatrix} 1 & 3 & 6 \\ 6 & 1 & 4 \\ 3 & 7 & 12 \end{vmatrix}+4\begin{vmatrix} 2 & 3 & 3 \\ 2 & 1 & 2 \\ 1 & 7 & 6 \end{vmatrix}=10\begin{vmatrix} 1 & 2 & 1 \\ 3 & 1 & 7 \\ 3 & 2 & 6 \end{vmatrix}$$

Q.5 : Find the value of k, if the area of triangle whose vertices are P (k, 0), Q (2, 2) R (4, 3) is $\frac{3}{2}$ sq. units.

Q.6 : Find x and y, if :

$$\begin{bmatrix} 2x+y & -1 & 1 \\ 3 & 4y & 4 \end{bmatrix}+\begin{bmatrix} -1 & 6 & 4 \\ 3 & 0 & 3 \end{bmatrix}=\begin{bmatrix} 3 & 5 & 5 \\ 6 & 18 & 7 \end{bmatrix}$$

Q.7 : Find matrix X such that AX = B,

where $A\begin{bmatrix} 1 & -2 \\ -2 & 1 \end{bmatrix}$ and $B=\begin{bmatrix} -3 \\ -1 \end{bmatrix}$

SECTION C

: **Solve the following : (ANY 3)** 9

Q.8 : Verify that A (B + C) = AB + AC in each of the following matrices :

$$A=\begin{bmatrix} 1 & -1 & 3 \\ 2 & 3 & 2 \end{bmatrix},\ B=\begin{bmatrix} 1 & 0 \\ -2 & 3 \\ 4 & 3 \end{bmatrix} \text{ and } C=\begin{bmatrix} 1 & 2 \\ -2 & 0 \\ 4 & -3 \end{bmatrix}$$

Q.9 : If A $\begin{bmatrix} 2 & -1 \\ 3 & -2 \\ 4 & 1 \end{bmatrix}$ and $B=\begin{bmatrix} 0 & 3 & -4 \\ 2 & -1 & 1 \end{bmatrix}$ verify that $(AB)^T=B^TA^T$

Q.10 : Solve the following linear equations by Cramer's Rule :

$2x-y+z=1$, $x+2y+3z=8$, $3x+y-4z=1$

Q.11 : If $\begin{vmatrix} 4+x & 4-x & 4-x \\ 4-x & 4+x & 4-x \\ 4-x & 4-x & 4+x \end{vmatrix}=0$, then find the

values of x.

Q.12 : Prove that

$$\begin{vmatrix} x+y & y+z & z+x \\ z+x & x+y & y+z \\ y+z & z+x & x+y \end{vmatrix} = 2 \begin{vmatrix} x & y & z \\ z & x & y \\ y & z & x \end{vmatrix}$$

SECTION D

: Answer the following : (ANY 1) 4

Q.13 : Find the area of quadrilateral whose vertices are A (–3, 1), B (–2, –2), C (1, 4), D (3, –1)

Q.14 : If $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$, prove that

$$A^n = \begin{bmatrix} 1 + 2n & -4n \\ n & 1 - 2n \end{bmatrix}, \text{ for all } n \in N$$

* * *