St. Peter's Senior Secondary School

(Affiliated to C.B.S.E. No. 2630043)

CLASS- XII(NON-MED)

ASSIGNMENT- 8 (MATHS)

CH- 4 (DETERMINANT)

Ex. 4.1,4.2

➢ LET'S REVISE:

1. A determinant of a square matrix A is denoted by det.A or |A|.

2.A determinant of order 1 x 1 matrix A = $[a_{11}]_{1X1}$ is given by $|a_{11}| = a_{11}$.

3.A determinant of order of 2 x 2 matrix A = $\begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}_{2x2}$ is given by

$$|A| = \begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix} = a_{11}\,a_{22} - a_{21}a_{12}$$

4.A determinant of order 3 x 3 matrix A = $\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}_{3x3}$ is given by (expanding along (R_1), we get

$$|A| = + a_{11}(a_{22}a_{33} - a_{32}a_{23}) - a_{12}(a_{21}a_{33} - a_{31}a_{23}) + a_{13}(a_{21}a_{32} - a_{31}a_{22})$$

5. We can find the value of a determinant by expanding along any one of the three rows (or columns) and the value remains same.

6.Generally, we find the value of a determinant by expanding along a row or column which has maximum number of zeroes.

7. For any square matrix A, the |A| satisfy following properties.

- **|A'| = |A|, where A' = transpose of A.**
- **If we interchange any two rows (or columns), then sign of determinant changes.**
- **If any two rows or any two columns are identical or proportional, then value of determinant is zero.**
- **If we multiply each element of a row or a column of a determinant by constant k, then value of determinant is multiplied by k.**
- **Multiplying a determinant by k means multiply elements of only one row (or one column) by k.**

8. If A = $[a_{ij}]_{3x3}$, then $|KA| = K^3\,|A|$.

9. If elements of a row or a column in a determinant can be expressed as sum of two or more elements, then the given determinant can be expressed as sum of two or more determinants.

10. If to each element of a row or a column of a determinant , the equimultiples of corresponding elements of other rows or columns are added, then value of determinant remains same.

11. The matrix A is singular if $|A| = 0$.

➢ IMPORTANT QUESTIONS:

1.If A and B are any 2X2 matrices , then det. (A+B) = 0 implies

a. det A + det B = 0

b. det A = 0 or det B = 0

c. None of these

d. det A = 0 and det B = 0

2. If $\begin{vmatrix} 2x & 5 \\ 8 & x \end{vmatrix} = \begin{vmatrix} 6 & 5 \\ 8 & 3 \end{vmatrix}$, then x is _____.

3. Multiplying a determinant by k means multiplying the elements of only one row (or one column) by _____.

4. If elements of a row (or a column) in a determinant can be expressed as the sum of two or more elements, then the given determinant can be expressed as the _____ of two or more determinants.

5. A = $\begin{bmatrix} 1 & 2 \\ 4 & 8 \end{bmatrix}$ is singular or not.

6.Evaluate:

i) 2 $\begin{vmatrix} 7 & -2 \\ -10 & 5 \end{vmatrix}$

ii) $\begin{vmatrix} \cos\alpha\cos\beta & \cos\alpha\sin\beta & -\sin\alpha \\ -\sin\beta & \cos\beta & 0 \\ \sin\alpha\cos\beta & \sin\alpha\sin\beta & \cos\alpha \end{vmatrix}$

❖ **NOTE – Please refer iDream learning mobile app.**