DAV PUBLIC SCHOOL, UNIT-VIII

SUB-MATHEMATICS

CHAPTER:-DETERMINANTS

WORKSHEET (BASIC)

CLASS:-XII

SECTION - A

1. If A is a 3×3 matrix and |adj A| = 64, then $|A| =$

   (a) ± 64 (b) ± 8 (c) 64 (d) 18

2. If Aij is the co-factor of aij, then the value of $|A|$ is

   (a) $a_{11}A_{11} + a_{12}A_{12} + a_{13}A_{13}$ (b) $a_{11}A_{31} + a_{12}A_{32} + a_{13}A_{33}$

   (c) $a_{11}A_{13} + a_{12}A_{12} + a_{13}A_{11}$ (d) none of these

3. If A, B are square matrix of order $3, A$ is non-singular and $AB = 0$, then B is a (a)

   (a) null matrix (b) singular matrix (c) unit matrix (d) non-singular matrix

4. Let $\begin{vmatrix} x & 2 & x \\ x^2 & x & 6 \\ x & x & 6 \end{vmatrix} = ax^4 + bx^3 + cx^2 + dx + e$. The value of $5a + 4b + 3c + 2d + e$ is equal to:

   (a) 0 (b) -16 (c) 16 (d) none of these

5. f $\begin{vmatrix} x & 2 \\ 18 & x \end{vmatrix} = \begin{vmatrix} 6 & 2 \\ 18 & 6 \end{vmatrix}$, then x is equal to

   (a) 6 (b) ± 6 (c) -6 (d) 0

6. If A is a skew-symmetric matrix of order 2, then det A is of the form

   (a) a^2 (b) $a^2 - 1$ (c) $a^2 + 1$ (d) none of these

7. If A is a invertible matrix of order 2, then $|A^{-1}|$ is_________.

8. If a, b, c are in A.P, then $\begin{vmatrix} x+2 & x+3 & x+2a \\ x+3 & x+4 & x+2b \\ x+4 & x+5 & x+2c \end{vmatrix}$ is ___________.

9. If $A = \begin{bmatrix} 1 & 2 & -1 \\ -1 & 1 & 2 \\ 2 & -1 & 1 \end{bmatrix}$, then the value of $\det(adj(adjA))$ is __________.

10. For any 2×2 matrix, if $A(adjA) = \begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$, then $|A| =$_________.

11. If $|A| = 11$, where A is a 3rd order square matrix then $|cofA| =$___________.

12. If A is 3×3 non-singular matrix such that $adjA = adjA^{-1}$, then $|A| =$____________.

13. If A is a square matrix of order 3×3, then find $|kA|$.

14. If A and B are square matrices of order 3 such that $|A| = -1, |B| = 3$, then find $|3AB|$

15. If B is a non-singular matrix and A is a square matrix, then find the value of $\det(B^{-1}AB)$.

16. Find the value of λ and μ, for which $x+y+z=5, x+2y+3z=9, x+3y+\lambda z=\mu$ has a unique solution.

17. If $A=\begin{bmatrix} 2 & 0 & 0 \\ 2 & 2 & 0 \\ 2 & 2 & 2 \end{bmatrix}$, find $|adj(adj(adjA))|$.

18. If $A=\begin{bmatrix} 1 & \sin\theta & 1 \\ \sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{bmatrix}, 0 \le \theta \le 2\pi$, find $|A|$.

SECTION - B

19. If $adjA=\begin{bmatrix} 2 & 3 \\ 4 & -1 \end{bmatrix}, adjB=\begin{bmatrix} 1 & -2 \\ -3 & 1 \end{bmatrix}$, then find $adj(AB)$.

20. If $A=\begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$, find values of a and b such that $A^2+aA+bI=0$.

21. If A is a skew-symmetric matrix of odd order n, then prove that $|A|=0$.

22. Without expanding, prove that $\Delta=\begin{vmatrix} 0 & a & -b \\ -a & 0 & -c \\ b & c & 0 \end{vmatrix}=0$.

23. .If $A=\begin{bmatrix} x & 5 & 2 \\ 2 & y & 3 \\ 1 & 1 & z \end{bmatrix}, xyz=80, 3x+2y+10z=20$, then find $A\cdot(adjA)$.

24. If A and B are square matrices of the same order, prove that $adj(AB)=(adjB)(adjA)$

25. Find the value of k, if the area of the triangle with vertices (k,0), (4,0) and (0,2) is 4 sq. units.

26. Find the equation of the line joining (1, 2) and (3, 6) using determinants.

27. Without expanding, evaluate the determinant: $\begin{vmatrix} (a^x+a^{-x})^2 & (a^x-a^{-x})^2 & 1 \\ (a^y+a^{-y})^2 & (a^y-a^{-y})^2 & 1 \\ (a^z+a^{-z})^2 & (a^z-a^{-z})^2 & 1 \end{vmatrix}$

28. If $A=\begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$ & $[A^3]=125$, then find α.

29. Prove that the points (a, b + c), (b, c + a) and (c, a + b) are collinear.

30. Find the sum of the two values of a which makes determinant, $\Delta=\begin{vmatrix} 1 & -2 & 5 \\ 2 & a & -1 \\ 0 & 4 & 2a \end{vmatrix}=86$