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**Sub: - Mathematics** 

## D.A.V. PUBLIC SCHOOL, NEW PANVEL

Plot No. 267, 268, Sector-10, New Panvel, Navi Mumbai-410206 (Maharashtra). Phone 022-27468211, 27482276 E-mail – davnewpanvel@gmail.com, www.davnewpanvel.com Topic – Matrices and Determinants (2) Holiday Homework

Std: XII

1. If the inverse of the matrix 
$$\begin{bmatrix} 7 & -3 & -3 \\ -1 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix}$$
 is the matrix  $\begin{bmatrix} 1 & 3 & 3 \\ 1 & \lambda & 3 \\ 1 & 3 & 4 \end{bmatrix}$   
then the value of  $\lambda$  is  
(a) - 4 (b) 1 (c) 3 (d) 4  
2. Let  $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$  be a square matrix such that  $adj A = A$ , then  $(a + b + c + d)$  is  
(a) 2a (b) 2b (c) 2c (d) 0  
3. If  $A = \begin{bmatrix} 3 & -2 \\ 4 & -2 \end{bmatrix}$ , then the value of 'k' if  $A^2 + 2I = kA$  is ,  
(a) 0 (b) -7 (c) 1 (d) 8  
4. If A is a square matrix of order 3 such that the value of  $|adjA| = 8$ , then the value of  $|A^T|$  is  
(a)  $\sqrt{2}$  (b)  $-\sqrt{2}$  (c) 8 (d)  $2\sqrt{2}$   
5. Find the matrix  $A^2$ , where  $A = [a_{i_1}]$  is a 2 × 2 matrix whose elements are given by  
 $a_{i_1} = maximum (i, f) - minimum (i, f)$ :  
(a)  $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$  (b)  $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$  (c)  $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  (d)  $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$   
6. The value of 'x', if  $\begin{vmatrix} 3x & 7 \\ -2 & 4 \end{vmatrix} = \begin{vmatrix} 8 & 7 \\ 6 & 4 \end{vmatrix}$  is  
(a)1 (b)2 (c)^{-1} (d)^{-2}  
7. If the matrix  $A = \begin{bmatrix} 0 & a & -3 \\ 2 & 0 & -1 \\ b & 1 & 0 \end{bmatrix}$  is skew-symmetric, then the value of 'a' and 'b' is (a)  
 $a=2, b=-3$  (b)a=-2, b=3 (c)a=-2, b=-3 (d)a=2, b=3  
8. The minor of the element 6 in  $\Delta = \begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$  is ?  
(a) -36 (b) -6 (c)8 (d) -14

- If the points (a, b), (c, d) and (a c, b d) are collinear, then using determinants show that ad = cb
- 10. If A is a square matrix of order 3 such that |adjA| = 64, then |A| is .....

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- 11. If  $\begin{bmatrix} 1 & 0 \\ y & 5 \end{bmatrix} + 2 \begin{bmatrix} x & 0 \\ 1 & -2 \end{bmatrix} = I$ , then find (x y).
- 12. If  $M_{11} = -40$ ,  $M_{12} = -10$  and  $M_{13} = 35$ , of the determinant  $\Delta = \begin{vmatrix} 1 & 3 & -2 \\ 4 & -5 & 6 \\ 3 & 5 & 2 \end{vmatrix}$ , then value of  $\Delta$  is ?

13. Find the minors of the diagonal elements of the matrix  $\begin{bmatrix} 1 & i & -i \\ -i & 1 & i \\ 1 & -i & i \end{bmatrix}$ 

- 14. If A is a matrix of order 2x2, then find  $(A^3)^{-1}$ ?
- 15. Examine the consistency of the following equations, using determinants: (i) x + y = 4, 3x - 4y = 2 (ii) 2x + 3y = 10, 4x + 6y = 20
- 16. For the matrix  $A = \begin{bmatrix} 2 & 3 & 5 \\ 4 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix}$ , if A = P + Q, where P is symmetric and Q is

skew-symmetric matrix. Find the matrix P.

- 17. If  $\begin{vmatrix} 2 & 3 & 2 \\ x & x & x \\ 4 & 9 & 1 \end{vmatrix} + 3 = 0$ , then value of x is ?
- 18. Find  $|(adjA^T)|$ , if  $A = \begin{bmatrix} 2 & -1 \\ 4 & 3 \end{bmatrix}$ .
- 19. If A is a non-singular square matrix of order 3 such that  $A^2 = 3A$ , then value of |A| is?
- 20. Check using determinants, whether the points (a+5, a-4), (a-2, a+3) and (a, a) line on a line?
- 21. Find a matrix A such that |A| = 2 and  $adj A = \begin{bmatrix} 2 & 2 & 0 \\ 2 & 5 & 1 \\ 0 & 1 & 1 \end{bmatrix}$ ? 22. Compute,  $(AB)^{-1}$ , when  $A = \begin{bmatrix} 1 & 1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & 2 & 0 \\ 0 & 3 & -1 \\ 1 & 0 & 2 \end{bmatrix}$
- 23. Obtain the product of the matrices  $A = \begin{bmatrix} 1 & p & 0 \\ 0 & 1 & p \\ 0 & 0 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & 0 & 0 \\ q & 1 & 0 \\ 0 & q & 1 \end{bmatrix}$ .

Hence find the determinant of the product of AB.

24. Using matrices solve the following system of linear equations:

8x + 4y + 3z = 18, 2x + y + z = 5, x + 2y + z = 5

25. Find the value of x(integer), if  $\begin{bmatrix} x & 4 & -1 \end{bmatrix} \begin{bmatrix} 2 & 1 & -1 \\ 1 & 0 & 0 \\ 2 & 2 & 4 \end{bmatrix} \begin{bmatrix} x & 4 & -1 \end{bmatrix}^T = 0$ ? 26. Determine the value of 2a + 3b - c, if  $A = \begin{bmatrix} 0 & -1 & 28 \\ a - 8 & 0 & 3b \\ -c + 2 & -2 & 0 \end{bmatrix}$  is a skew-symmetric matrix?