ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

FOR GOD AND COUNTRY

SOLUTIONS OF WORKSHEET-3

SUBJECT – MATHEMATICS

Pre-test

Chapter: MATRICES AND DETERMINANTS **Class: XII**

Topic: DETERMINANTS & INVERSE OF MATRICES **Date: 05.05.2020**

I] Choose the correct option $(1 \times 15 = 15)$

1) A square matrix A is called singular if –

a) $|A| > 0$
b) $|A| < 0$
c) $|A| = 1$
d) $|A| = 0$

2) $\frac{Adj.A}{|A|} =$

a) A^T
b) A^{-1}
c) $(A^T)^{-1}$
d) $(A^{-1})^T$

3) Which of the following statements is false –

a) $(A^{-1})^{-1} = A$
b) $(A^T)^{-1} \neq (A^{-1})^T$
c) $A^{-1} \cdot A = A \cdot A^{-1} = I$
d) $(AB)^{-1} = B^{-1} \cdot A^{-1}$

4) If $A = \begin{bmatrix} 5 & -8 \\ -5 & 8 \end{bmatrix}$, then $A^{-1} = ?$

a) $\frac{1}{5}\begin{bmatrix} 8 & 5 \\ -8 & -5 \end{bmatrix}$
b) $\frac{1}{8}\begin{bmatrix} 8 & 5 \\ 8 & 5 \end{bmatrix}$
c) $\frac{1}{5}\begin{bmatrix} -8 & -5 \\ -8 & -5 \end{bmatrix}$
d) Does not exist.

5) If $A = \begin{bmatrix} 7 & 8 \\ 2 & 2 \end{bmatrix}$, then $A^{-1} = ?$

a) $\frac{1}{2}\begin{bmatrix} -2 & -7 \\ -8 & 2 \end{bmatrix}$

b) $\frac{1}{2}\begin{bmatrix} 2 & 7 \\ 8 & -2 \end{bmatrix}$

c) $\begin{bmatrix} -1 & 4 \\ 1 & -\frac{7}{2} \end{bmatrix}$

d) $\begin{bmatrix} 1 & -4 \\ -1 & \frac{7}{2} \end{bmatrix}$

6) If $A = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$, *then* A^{-1} *is* $-$

a) –A

b) A

c) 1

d) None of these.

7) If $A = diag(a \quad b \quad c)$, *where* a, b, c *are non zero real nos.* ; *then* A^{-1} *is* $-$

a) $diag(a^{-1} \quad b^{-1} \quad c^{-1})$

b) $diag(bc \quad ac \quad ab)$

c) $\frac{A}{|A|}$

d) $\frac{I}{|A|}$

8) If $A = \begin{bmatrix} \cos 2\theta & -\sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{bmatrix}$, then $A^{-1} = ?$

a) –A

b) A^T

c) $(-A)^T$

d) None of these.

9) The adjoint of the matrix $\begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ *is* $-$

a) $\begin{bmatrix} 4 & 8 & 3 \\ 2 & 1 & 6 \\ 0 & 2 & 1 \end{bmatrix}$

b) $\begin{bmatrix} 1 & -1 & 0 \\ -2 & 3 & -4 \\ -2 & 3 & -3 \end{bmatrix}$

c) $\begin{bmatrix} 11 & 9 & 3 \\ 1 & 2 & 8 \\ 6 & 9 & 1 \end{bmatrix}$

d) $\begin{bmatrix} 1 & -2 & 1 \\ -1 & 3 & 3 \\ -2 & 3 & -3 \end{bmatrix}$

10) The inverse of the matrix $\begin{bmatrix} 3 & 2 & 1 \\ 4 & -1 & 2 \\ 7 & 3 & -3 \end{bmatrix}$ is –

a) $\frac{1}{62}\begin{bmatrix} -3 & 9 & 5 \\ 26 & -16 & -2 \\ 19 & 5 & -11 \end{bmatrix}$

b) $\frac{1}{62}\begin{bmatrix} -3 & 9 & 5 \\ 26 & -16 & 2 \\ 19 & 5 & -11 \end{bmatrix}$

c) $\frac{1}{62}\begin{bmatrix} -3 & 9 & 5 \\ 26 & -16 & -2 \\ 19 & 5 & 11 \end{bmatrix}$

d) $\frac{1}{62}\begin{bmatrix} -3 & 9 & -5 \\ 26 & -16 & -2 \\ 19 & 5 & -11 \end{bmatrix}$

11) Which of the following systems of equations is consistent ?

i. $3x + 4y + 7z = 1$, $x + 2y + 3z = 1$, $2x + 3y + 5z = 1$
ii. $x + 2y + z = 7$, $x + 3z = 11$, $2x - 3y = 1$

a) Only i
b) Only ii
c) Both i & ii
d) None of these.

12) Which of the following systems of equations has infinite number of solutions ?

i. $2x - 3y + 4x = 7$, $3x - 4y + 5z = 8$, $4x - 5y + 6z = 9$
ii. $3x + 4y + 5z = 2$, $x + 2y + 3z = 1$, $5x + 6y + 7z = 3$

a) Only i
b) Only ii
c) Both i & ii
d) None of these.

13) The value of $\begin{vmatrix} 10! & 11! & 12! \\ 11! & 12! & 13! \\ 12! & 13! & 14! \end{vmatrix}$ *is* –

a) $10 \times 11 \times 12$
b) $10! \times 11! \times 12!$
c) 0
d) $2(10! \times 11! \times 12!)$

14) If $f(x) = \begin{vmatrix} \sin x & \cos x & \tan x \\ x^3 & x^2 & x \\ 2x & 1 & 1 \end{vmatrix}$, then $\lim_{x \to 0} \frac{f(x)}{x^2} = ?$

a) -1
b) 1
c) 0
d) -2

15) If two rows (or two colomns) of $|A|$ are identical, then $|A| = ?$

a) 1
b) -1
c) 0
d) 2

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