Holiday Home work 2022

Assignment of Ch -3 Matrices

Important Example of NCERT : 4, 8 , 11 , 13, 19 , 21 , 22 , 24, 28
Important Question of NCERT : Ex 3.1 6(ii), 10, Ex 3.2 : 7(ii), 12, 13, 16, 17 , 18 , 19
. Ex 3.3: 6(i), 9 , 11, 12 Ex 3.4 : 7, 12, 15
Important Question of NCERT Miscellaneous Ex : 1 ,3 , 5 , 7 , 11, 13 , 14, 15

1. Write the number of all possible matrices of order 2 x 2 with each entry 1.2 or 3
2. Construct a matrix of order 2 x3 , whose element are given by $a_{ij} = \frac{1}{3}$ (-3i +j)
3. Find the value of x-y , if $2\begin{bmatrix}1 & 3\\ 0 & x\end{bmatrix} + \begin{bmatrix}y & 0\\ 1 & 2\end{bmatrix} = \begin{bmatrix}5 & 6\\ 1 & 8\end{bmatrix}$
4. If $3A - B = \begin{bmatrix}5 & 0\\ 1 & 1\end{bmatrix}$ and $B = \begin{bmatrix}5 & 6\\ 1 & 8\end{bmatrix}$, then find the matrix A
5. If A is a square matrix such that $A^2 = A$, then $(I - A)^3 + A$ is equal to
6. Find a matrix A, such that $2A - 3B + 5C = 0$, where $B = \begin{bmatrix}-2 & 2 & 0\\ 3 & 1 & 4\end{bmatrix}$ and $C = \begin{bmatrix}2 & 0 & 2\\ 7 & 1 & 6\end{bmatrix}$
7. If $A = \begin{bmatrix}0 & 2\\ 3 & -4\end{bmatrix}$ and $kA = \begin{bmatrix}0 & 3a\\ 2b & 24\end{bmatrix}$, then find the values of k , a and b.
8. Show that all the diagonal elements of a skew matrix are zero.
9. If the matrix $A = \begin{bmatrix}0 & a & -3\\ 2 & 0 & -1\\ b & 1 & 0\end{bmatrix}$ is skew- symmetric , find the value a and b.
10. If A is a square matrix such that $A^2 = I$, then find the simplified value of $(A - I)^3 + (A+I)^3 - 7A$, where I is identity matrix.
11. If A is a square matrix such that $A^2 = A$, then find the simplified value of $7A - (A + I)^3$ where I is identity matrix.
12. Write a square matrix of order 2, which is both symmetric and skew symmetric.
13. If $A = \begin{bmatrix}1 & 2 & 2\\ 2 & 1 & x\\ -2 & 2 & -1\end{bmatrix}$ is a matrix satisfying $AA' = 9\, I_3$. Find x.
14. Find the inverse of following matrix using elementary operations (first question by Row and Second by column)
15. Find a matrix A such that $\begin{bmatrix}2 & -1\\ 1 & 0\\ -3 & 4\end{bmatrix} A = \begin{bmatrix}-1 & -8\\ 1 & -2\\ 9 & 22\end{bmatrix}$ (ii) $\begin{bmatrix}2 & -1\\ 1 & 0\\ -3 & 4\end{bmatrix} A = \begin{bmatrix}-1 & -8 & -10\\ 1 & -2 & -5\\ 9 & 22 & 15\end{bmatrix}$
16. if $A = \begin{bmatrix}1 & -1\\ 2 & -1\end{bmatrix}$, $B = \begin{bmatrix}a & 1\\ b & -1\end{bmatrix}$ and $(A+B)^2 = A^2 + B^2$. then find the values of a and b.
17. Express the following matrix as a sum of a symmetric and skew –symmetric matrix, and verify your result.

$$\begin{bmatrix}3 & -2 & -4\\ 3 & -2 & -5\\ -1 & 1 & 2\end{bmatrix}$$

18. Let A and B are matrices of order 3x2 and 2x4 respectively . Write the order of of matrix (AB) and (AB)'
19. Three school A, B and C organized a mela for collecting funds for helping the rehabilitation of food victims. They sold handmade fans , mats , and plates from recycled material at a cost of Rs 25, Rs 100 and Rs 50 each. The number of articles sold are given. Find the funds collected by each school separately by selling the above articles. Also find the total funds collected for the purpose.

School→ / Articles↓	A	B	C
Hand fans	40	25	35
Mats	50	40	50
Plates	20	30	40

Assignment of Ch – 4 Determinants

Important Example of NCERT : 11, 12, 14 , 15 , 16 ,18, 25 , 26 , 29 , 30 , 32 , 33 , 34 Important Question of NCERT : Ex 4.1: 4 , 8 Ex 4.3: 2 ,3(i) , 5 Ex 4.4 : 3, 4 Ex 4.5: 4, 9, 14, 15, 17, 18 Ex 4.6 : 11, 15 Important Question of NCERT Miscellaneous Ex : 2, 4, 11 , 13 ,15 , 19

1. If A and B are square matrix of the same order 3, such that IAI = 2 and AB = $2I_3$, write the value of IBI.
2. If A is a square matrix of order 3, such that IAI = 9, then write the value of I2 adjAI.
3. If A is a 3x3 invertible matrix, then what will be the value of k if $\det(A)^{-1} = (\det A)^k$.
4. If A and B are square matrices of order 3 such that IAI = -1 and IBI = 3, then find the value of I 2ABI
5. If A is an invertible matrix of order 2 and IAI = 4 , then find the value of $\det(A^{-1})$
6. If A is a 3 x 3 invertible matrix and I3AI = k IAI , then write the value of k.
7. If A is a square matrix and IAI = 2 the write the value of IAA'I
8. For what value of x , the matrix $\begin{matrix} 5-x & x+1 \\ 2 & 4 \end{matrix}$ is singular?
9. Given matrix A = $\begin{matrix} 2 & -3 \\ -4 & 7 \end{matrix}$ compute A^{-1} and show that $2A^{-1} = 9I - A$ where I is identity matrix.
10. Determine the product $\begin{matrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{matrix} \begin{matrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 4 \end{matrix}$ and use it to solve the system of equations :
    x –y +z = 4, x-2y -2z = 9 and 2x + y + 3z = 1.
11. Use product $\begin{matrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{matrix} \begin{matrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{matrix}$ to solve the system of equations:
    x + 3z = 9 , -x + 2y - 2z = 4 and 2x -3y + 4z = -3
12. A committee of a residential colony decided to award some of its members for Honesty, for Helping others and for supervising the workers to keep the colony neat and clean. The sum of all the awardees is 12. Three times the sum of awardees for cooperation and supervision added to two times the number of awardees for Honesty is 33. If the sum of the number of awardees for Honesty and supervision is twice the number of awardees for helping others, using matrix method, find the number of awardees of each category.
13. Solve the following L. P. P graphically , Maximize Z= 50 x + 60 y

    subject to constrains: $2x + y \leq 18$, $x + 2y \leq 12$, $x + 3y \leq 15$, $x, y \geq 0$
14. Solve the following L. P. P graphically , Minimize Z= 30x - 30 y + 1800

    subject to constrains: $x + y \geq 15$, $x + y \leq 30$, $x \leq 15$, $y \leq 20$ $x, y \geq 0$

Derivative (XII)

1. $Y = e^{\tan x}$ then prove that $\cos^2 x\, y_2 - (1+\sin 2x)\, y_1 = 0$
2. $X = b(\cos a + \log\tan(a/2))$ and $y = b \sin a$ find y_2 at $a = \pi/4$
3. $Y = \sin^{-1}(x\sqrt{1-x} - \sqrt{x}\sqrt{i-x^2})$ find dy/dx
4. $Y = \operatorname{cosec}^{-1}x$, $x > 1$ then prove that $x(x^2-1)y_2 + (2x^2-1)y_1 = 0$
5. If $e^{a\tan^{-1}x} = \log y$ prove that $(1+x^2)y_2 + (2x-a)y_1 = 0$
6. $Y = (\cot^{-1}x)^2$ then show that $(x^2+1)^2 y_2 + 2x(x^2+1)y_1 = 2$
7. If $x^y = e^{x-y}$ then prove that $dy/dx = \log x/(1+\log x)^2$
8. If $\sin y = x \sin(a+y)$ prove that $dy/dx = \sin^2(a+y) / \sin a$

9. X = a (cost + t sint) and y = a(sint – t cost), $0<t<\pi/2$, find y_2
10. X =2cosa – cos2a, y = 2sina – sin2a prove that dy/dx = Tan (3a/2)
11. $Y = (x + \sqrt{x^2+1})^m$ then show that $(x^2+1)y_2 + xy_1 - m^2y = 0$
12. If $x^m y^n = (x+y)^{m+n}$ prove that $y_2 = 0$
13. X = cosa and $y \sin^3 a$ prove that $y\, y_2 + y_1^2 = 3 \sin^2 a (5 \cos^2 a - 1)$
14. $Y = x^x$ prove that $x\, y\, y_2 - x y_1^2 - y^2 = 0$

Inverse Trigonometry (XII)

1. Prove that $\cos(\tan^{-1}(\sin(\cot^{-1}x)))$
2. Find the value of $\cos^{-1}(\cos \frac{13\pi}{6})$
3. Express $\tan^{-1}(\frac{Cosx}{1-Sinx})$ in simplest form $\frac{-\pi}{2} < x < \frac{3\pi}{2}$
4. Express $\tan^{-1}(\frac{Cosx-Sinx}{Cosx+Sinx})$ in simplest form.