SUMMER VACATION

HOLIDAY HOMEWORK

SESSION 2023-24

CLASS XII (Science)

MRGS, ROHTAK

PREFACE

Dear Parents and Students,

Summer vacation is around the corner, bringing with itself a much-needed respite from hectic school days. We hope that you will thoroughly enjoy the vacations and make the most of this summer. While it is indeed important that you relax and refresh yourselves, it is also important that you exercise your minds.

Keeping this in mind, we have designed various exciting activities to keep the students engaged and active during the summer vacation. These fun projects/ assignments would enhance learning skills, help understand concepts better, and make for a great crash course aimed at improving academic output.

These activities will not only help you to revise what was taught, but will also enrich your knowledge. These projects will be assessed as Subject Enrichment Activity, Portfolio or Art Integrated activity.

We encourage parents to motivate and support the students to ensure the given work is completed in time, to the best of their ability. Your support and encouragement both have a huge impact on your child's learning ability.

The Holiday Home Work is to be done neatly with relevance to the questions asked and to be submitted to the subject teachers . School reopening i.e. 1th July 2023.

Wishing you a fun filled, safe summer vacation.

PRINCIPAL
MR. DHARMVEER

English

1. Choose any two comprehensive passages (**Discursive & Case based) from** e-book or any source and write the answers of the questions. Find 10 difficult words from the passage.

2. Write 10 objective questions of the chapter "The Last Lesson" ", Lost Spring" and "Deep Water" Which has not been written in your Fair Notebook.

3. Write 10 objective questions of the chapter "The Third Level" and "Tiger King" which has not been written in your Fair Notebook.

4. Write two conceptual and internal questions of each chapter "The Last Lesson", "Lost Spring", and " Deep Water" and " The Third Level" and " The Tiger King" .

5. Write summary of the poem "My Mother At Sixty Six" in your own language.

6. Write five Notices (Meeting,Event,Lost & Found, Tour,Competition).

7. Write five invitation Letters. Formal -In a fixed and Printed format.

Physics

1. Revise Chapter 1, 2, 3.

2. Make a Project file on an Electric Field, Potential or Capacitor.

3. Do give assignment in your fair Notebook and Complete your Practical file

Chemistry

1.Revise ch-1 to 3.

2.Do all the pyq of last 5 years.

3.Do all the ncert questions of these chapters in your fnb.

4.Prepare a project report on battery or colligative properties.

5.Solve the assignment in your fnb.

Biology

1: Revise chapter -2

 Sexual Reproduction in Flowering plant.

2: Revise chapter -3

 Human Reproduction

3: Revise chapter:4

   Reproductive Health

4: Do assignment of chapter 2:3:4 in your

 Note book.

5: Write Ncert question of chapter 2:3:4

In your Notebook.

6: Draw diagram of Male reproductive system, Female Reproductive system.

Flower,ovule. Embryo sac. Double Fertilization. Graph of Menstrual cycle.

Structure of Graffian follicles

Maths

Practice, chapter 3,4,5 and 7 (up to done) and assignment all in rough notebook

Q.1 If two rows of a determinants are identical, then what is the value of the determinant? (2012 I)

(a) 0 (b)1 (c)-1 (d) can be any real value

Q.2 If A=$\begin{vmatrix} 1 & 2 \\ 2 & 3 \end{vmatrix}$ and B = $\begin{vmatrix} 1 & 0 \\ 1 & 0 \end{vmatrix}$, then what is the (2012 I)

Value of determinant of AB? **(2012 I)**

(a) 0 (b)1 (c) 10 (d) 20

Q.3 If $\begin{vmatrix} 8 & -5 & 1 \\ 5 & x & 1 \\ 6 & 3 & 1 \end{vmatrix}$ =2, then what is the value of x?

(a) 4 (b) 5 (c) 6 (d) 8 **(2012 II)**

Q.4 What is the value of $\begin{vmatrix} -a^2 & ab & a \\ ab & -b^2 & bc \\ ac & bc & -c^2 \end{vmatrix}$ = ?

(2012 I)

Q.5 If a matrix A has inverse B and C, then which one

of the following is correct ?

(a) B may not be equal to C

(b) B should be equal to C

(c) B and C should be unit matrices

(d) None of the above

(2012 I)

Q.6 If A is a square matrix such that $A^2=1$, where I is the identity matrix, then what is the value of A^{-1}?

(a) A+I (b) Null matrix

(c) A (d) Transpose of A **(2012 I)**

Q.7 If A =$\begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}$ and B = $\begin{bmatrix} 0 & -1 \\ 1 & 2 \end{bmatrix}$, then what is the value of B^{-1} A^{-1}? (2012 I)

(a) $\begin{bmatrix} 1 & -3 \\ -1 & 2 \end{bmatrix}$ (b) $\begin{bmatrix} -1 & 3 \\ 1 & -2 \end{bmatrix}$

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

Q.8 If each element in a row of a determinant is

multiplied by the same factor r, then the value of

the determinant. (2012

(a) is multiplied by r^3 (b) is increased by 3r

(c) remains unchanged (d) is multiplied by r

Q.9 The value of the determinant $\begin{vmatrix} x^2 & 1 & y^2+z^2 \\ y^2 & 1 & z^2+x^2 \\ z^2 & 1 & x^2+y^2 \end{vmatrix}$ is (2012

(a) 0 (b) $x^2+y^2+z^2$

(c) $x^2+y^2+z^2+1$ (d) None of these

Q.10 If the matrix $\begin{vmatrix} a & 2 & 2 \\ -3 & 0 & 4 \\ 1 & -1 & 1 \end{vmatrix}$ is not invertible, then

(2012 II)

(a) a= -5 (b) a=5 (c) a=0 (d)a=1

Q.11 The inverse of a diagonal matrix is a (2012 II)

(a) symmetric matrix (b) skew-symmetric matrix

(c) diagonal matrix (d) None of these

Q.12 The determinant of a orthogonal matrix

(a) ± 1 (b) 2 (c) 0 (d) ± 2 **(2013 I)**

Q.13 The value of the determinant $\begin{vmatrix} m & n & p \\ p & m & n \\ n & p & m \end{vmatrix}$

(a) is a perfect cube (b) is a perfect square

(c) has linear factor (d) is zero

Q.14 The roots of the equation (2013 I)

$\begin{vmatrix} 1 & t-1 & 1 \\ t-1 & 1 & 1 \\ 1 & 1 & t-1 \end{vmatrix}$ =0 are

Q.18 If A and B are two two non-singular square Matrices such that AB-A , then which one of the

following is correct? (2013

(a) B is an identity matrix (b) B = A^{-1}

(c) B = A^2 (c) Determinants of B is zero

Q.19 The cofactor of the element 4 in the

determinants $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 5 & 8 & 9 \end{vmatrix}$ is

(a) 2 (b) 4 (c) 6 (d) -6

Q.20 What is the value of the determinant $\begin{vmatrix} 1 & bc & a(b+c) \\ 1 & ca & b(c+a) \\ 1 & ab & c(a+b) \end{vmatrix}$?

Q.21 If A is a square matrix of order 3 with

$|A| \neq 0$, which one of the following is correct?

(a) $|adj = A||A|$ (b) $|adj\,A| = |A|^2$

(c) $|adj\,A| = |A|^3$ (d) $|adj\,A|^2 = |A|$

(a)1,2   (b) -1,2   (c) 1,-2   (d) -1,-2

Q.15 If D is determinant of order 3 and D' is the Determinant obtained by replacing the element Of D by their cofactors, then which one of the Following is correct?

(a) D'=D^2 (b) D'=D^3 (c)D'=2D^2 (d) D'=3D^3

Q.16 Consider the following statements   (2013 I)

I. A matrix is not a number.

II. Two determinants of different orders may have the Same value.

Which of the above statement(s) is/are correct?

(a) Only I   (b) Only II

(c) Both I and II   (d) Neither I and II

Q.17 What is the value of the minor of the element

9 in the determinant $\begin{bmatrix} 10 & 19 & 2 \\ 0 & 13 & 1 \\ 9 & 24 & 2 \end{bmatrix}$ **?**   **(2013 I)**

(a) -9   (b) -7   (c) 7   (d) 0

Q.22 If 2A =$\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$, then what is A^{-1} equal to ?   **(2013 II)**

(a) $\begin{bmatrix} 2 & -1 \\ -3 & 2 \end{bmatrix}$ (b) $\frac{1}{2}\begin{bmatrix} 2 & -1 \\ -3 & 2 \end{bmatrix}$ (c) $\frac{1}{4}\begin{bmatrix} 2 & -1 \\ -3 & 2 \end{bmatrix}$ (d) None of these

Q.23 Consider the following statements   **(2013 II)**

   I. The matrix $\begin{vmatrix} 1 & 2 & 1 \\ a & 2a & 1 \\ b & 2b & 1 \end{vmatrix}$ is singular

   II. The matrix $\begin{vmatrix} c & 2c & 1 \\ a & 2a & 1 \\ b & 2b & 1 \end{vmatrix}$ is non-singular

   Which of the above statement(s) is / are correct?

   (a) Only I   (b) Only II   (c) Both I and II(d) Either I or II

Q.24 One of the roots of $\begin{vmatrix} x+a & b & c \\ a & x+b & c \\ a & b & x+x \end{vmatrix} = 0$ **is**   **(2013 II)**

   (a) abc   (b) a+b+c   (c) –(a+b+c)   (d) –abc

Q.25 The determinant of an odd order skew-symmetric matrix is always   **(2014 I)**

   (a) zero (b) one   (c) negative   (d) depends on the matrix

Q.26 If any two adjacent rows or columns of a determinant are interchanged in position, the value of the determinant   **(2014 I)**

   (a) becomes zero   (b) remains the same   (c) changes its sign   (d) is doubled

Q.27 Consider two matrices

   A=$\begin{vmatrix} 1 & 2 \\ 2 & 1 \\ 1 & 1 \end{vmatrix}$ $and\ B = \begin{vmatrix} 1 & 2 & -4 \\ 2 & 1 & -4 \end{vmatrix}$ **(2014 I)**

   Which one of the following is correct?

   (a) B is the right inverse of A

   (b) B is the left inverse of A

   (c) B is the both sided inverse of A

   (d) None of the above

Q.28 Consider the following statements in respect of the matrix A=$\begin{bmatrix} 0 & 1 & 2 \\ -1 & 0 & -3 \\ -2 & 3 & 0 \end{bmatrix}$ **(2014 II)**

   I. The matrix A is skew – symmetric

   II. The matrix A is symmetric

   III. The matrix A is invertible.

    Which of the above statement(s) is/are correct ?

   (a) Only I   (b) Only III

   (c) I and II   (d) II and III

Q.29 If A and B are square matrices of second order such that |A|= -1 and |B| = 3. then what is |$3AB$| equal to?   **(2014 II)**

(a) 3   (b) -9   (c) -27   (d) None of these

Q.30 If the matrix A is such that $\begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix} A = \begin{bmatrix} 1 & 1 \\ 0 & -1 \end{bmatrix}$, then what is A equal to ? (2014 II)

(a) $\begin{bmatrix} 1 & 4 \\ 0 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 4 \\ 0 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} -1 & 4 \\ 0 & -1 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & -4 \\ 0 & -1 \end{bmatrix}$

Q.31 From the matrix equation AB = AC, where A, B and C are the square matrices of same order, we can conclude B = C provided (2014 II)

(a) A is non-singular   (b) A is singular(c) A is symmetric   (d) A is skew-symmetric

Q.32 If A is an invertible matrix, then what is det (A^{-1}) equal to? (2014 II)

(a) det (A)   (b) $\frac{1}{det\ (A)}$ (c)1   (d) None of these

Q.33 If $\begin{vmatrix} 6i & -3i & 1 \\ 4 & 3i & -1 \\ 20 & 3 & i \end{vmatrix} = x + iy, where\ i = \sqrt{-1}$, then what is x equal to? (2014 II)

(a) 3   (b) 2   (c) 1   (d) 0

Q.34 If $\begin{vmatrix} a & b & 0 \\ 0 & a & b \\ b & 0 & a \end{vmatrix} = 0$, then which one of the following is correct? (2014 II)

(a) a/b is one of the cube roots of unity

(b) a/b is one of the cube roots of unity

(c) a is one of the cube roots of unity

(d) b is one of the cube roots of unity

Q.35 Consider the following statements (2014 II)

I. Determinant is a square matrix

II. Determinant is a number associated with a square matrix

Which of the above statement(s) is/are correct?

(a) Only I   (b) Only II   (c) Both I and II(d) Neither I and II

Q.36 If a$\neq b \neq c$ all are positive, then the value of determinant $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$ is (2014 II)

(a) non-negative   (b) non-positive   (c) negative   (d) positive

Q.37 The value of $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1 + x & 1 \\ 1 & 1 & 1 + y \end{vmatrix}$ is (2015 I)

(a) x+y   (b) x-y   (c) xy   (d) 1+x+y

Q.38 Consider the following in respect of two non-singular matrices A and B same order. (2015 I)

I. det (A+B) =det A+ debt

II. (A+B)$^{-1}$ = A^{-1}+B^{-1}

Which of the above statement(s) is/are correct?

(a) Only I   (b) Only II   (c) Both I and II(d) Neither I nor II

Q.39 If A=$\begin{bmatrix} 2 & 7 \\ 1 & 5 \end{bmatrix}$, then what is A+3A^{-1} equal to? (2015 I)

(a) 3l (b)5l (c) 7l (d) None of these

Q.40 If A is an invertible matrix of order n and k is any positive real number, then the value of [det (kA)]$^{-1}$ det(A) is (2015 II)

(a)k^{-n} (b) k^{-1} (c) k^n (d) nk

Q.41 If the value of the determinant $\begin{vmatrix} a & 1 & 1 \\ 1 & b & 1 \\ 1 & 1 & c \end{vmatrix}$ is positive , where a$\neq b \neq c,$ then the value of abc (2015 II)

(a) cannot be less than 1   (b) is greater than -8

(c) is less than -8   (d) must be greater than 8

Q.42 If a,b and c are real numbers, then the value of the determinants $\begin{vmatrix} 1 - a & a - b - c & b + c \\ 1 - b & b - c - a & c + a \\ 1 - c & c - a & a + b \end{vmatrix}$ is

(a) 0   (b) 9a-b)(b-c)(c-a)   (c) (a+b+c)^2 (d) (a+b+c)^3 (2015 II)

Q.43 Consider the following statements in respect of the determinant $\begin{vmatrix} cos^2\frac{\alpha}{2} & sin^2\frac{\alpha}{2} \\ sin^2\frac{\beta}{2} & cos^2\frac{\beta}{2} \end{vmatrix}$ (2015 II)

Where α, β are complementary angles.

I. The value of the determinant is $\frac{1}{\sqrt{2}} cos\left(\frac{\alpha - \beta}{2}\right)$

II. The maximum value of the determinant is $\frac{1}{\sqrt{2}}$.

Which of the above statement(s) is/are correct?
(a) Only I   (b) Only II   (c) Both I and II(d) Neither I nor II

Q.44 The matrix A=$\begin{bmatrix} 1 & 3 & 2 \\ 1 & x-1 & 1 \\ 2 & 7 & x-3 \end{bmatrix}$ will have inverse for every real number x except for   **(2015 II)**

(a) x=$\frac{11\pm\sqrt{5}}{2}$ (b) x=$\frac{9\pm\sqrt{5}}{2}$ (c) x=$\frac{11\pm\sqrt{3}}{2}$ (d) x=$\frac{9\pm\sqrt{3}}{2}$

Q.45 If A is an orthogonal matrix of order 3 and B=$\begin{bmatrix} 1 & 2 & 3 \\ -3 & 0 & 2 \\ 2 & 5 & 0 \end{bmatrix}$, then which of the following is/are correct?

    (I). $|A| = \pm 47$ **II. AB = BA**

Select the correct answer using the code given below: **(2015 II)**
(a) Only I   (b) Only II   (c) Both I and II   (d) Neither I nor II

Q.46 If A is a square matrix, then what is adj (A^{-1})−(adj A)$^{-1}$ equal to?   **(2016 I)**
(a) 2$|A|$ (b) Null matrix   (c) Unit matrix   (d) None of these

Directions (Q. Nos. , 47-48) Consider the function f (x)= $\begin{vmatrix} x^3 & \sin x & \cos x \\ 6 & -1 & 0 \\ p & p^2 & p^3 \end{vmatrix}$, where p is a constant.

Q.47 What is the value of f(O) ?   **(2016 I)**
(a) p^3 (b) 3p^3 (c) 5p^3 (d) -6p^3

Q.48 What is the value of p for which $f(O) = 0$?
(a) $-\frac{1}{6} or 0$ (b)-1   (c)$-\frac{1}{6} or 1$ (d) -1 or 1

Q.49 Which of the following determinants have value "zero" ?   **(2016 I)**

(I) $\begin{vmatrix} 41 & 1 & 5 \\ 79 & 7 & 9 \\ 29 & 5 & 3 \end{vmatrix}$ (II) $\begin{vmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{vmatrix}$ (III) $\begin{vmatrix} 0 & c & b \\ -c & 0 & a \\ -b & -a & o \end{vmatrix}$

Select the correct answer using the code given below.
(a) I and II   (b) II and III   (c) I and III   (d) I, II and III

Q.50 The system of linear equations kx + y+z = 1, x+ky +z =1 and x+y+kz = 1 has a unique solution under which one of the following conditions?
(a) $k \neq 1\ and\ k \neq -2$
(b)$k \neq 1\ and\ k \neq 2$
(c) $k \neq -1\ and\ k \neq -2$
(d) $k \neq -1\ and\ k \neq 2$

Q1 Construct a 2 × 2 matrix A = [a$_{ij}$] whose elements are given by $a_{ij} = \left|(i)^2 - j\right|$.

(2020)

Q2 Write the number of all possible matrices of order 2 × 2 with each entry 1, 2 or 3.

(AI 2016)

Q3 Write the element a$_{23}$ of a 3 × 3 matrix A = [a$_{ij}$] whose elements a$_{ij}$ are given by $a_{ij} = \frac{|i-j|}{2}$.

(Delhi 2015)

Q4 The elements a$_{ij}$ of a 3 × 3 matrix are given by $a_{ij} = \frac{1}{2}\left|-3i + j\right|$. Write the value of element a$_{32}$.

(AI 2014C)

Q5 For a 2 × 2 matrix A = [a$_{ij}$], whose elements are given by $a_{ij} = \frac{(i+2j)^2}{4}$, write the value of a$_{21}$.

(Delhi 2012C)

Q6 For a 2 × 2 matrix, A = (a$_{ij}$) whose elements are given by $aij = \frac{i}{j}$, write the value of a$_{12}$.

Q7 If a matrix has 5 elements, then write all possible orders it can have *(AI 2011)*

Q8 If $\begin{bmatrix} x-y & z \\ 2x-y & w \end{bmatrix} = \begin{bmatrix} -1 & 4 \\ 0 & 5 \end{bmatrix}$, find the value of x + y. *(AI 2014)*

Q9 If $\begin{pmatrix} a+4 & 3b \\ 8 & -6 \end{pmatrix} = \begin{pmatrix} 2a+2 & b+2 \\ 8 & a-8b \end{pmatrix}$, write the value of a – 2b. *(Foreign 2014)*

Q10 If $\begin{bmatrix} x.y & 4 \\ z+6 & x+y \end{bmatrix} = \begin{bmatrix} 8 & w \\ 0 & 6 \end{bmatrix}$, write the value of (x + y + z) *(Delhi 2014C)*

Q11 Find the value of a if
$\begin{bmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$ *(Delhi 2013)*

Q12 Find the value of b if
$\begin{bmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$ *(Delhi 2013)*

Q13 If $\begin{bmatrix} x-y & 2y \\ 2y+z & x+y \end{bmatrix} = \begin{bmatrix} 1 & 4 \\ 9 & 5 \end{bmatrix}$, then write the value of (x + y + z). *(AI 2013C)*

Q14 If $\begin{bmatrix} 2x+1 & 2y \\ 0 & y^2+1 \end{bmatrix} = \begin{bmatrix} x+3 & 10 \\ 0 & 26 \end{bmatrix}$, write the value of (x + y). *(AI 2012C)*

Q15 If $\begin{bmatrix} x & x-y \\ 2x+y & 7 \end{bmatrix} = \begin{bmatrix} 3 & 1 \\ 8 & 7 \end{bmatrix}$, the find the value of y. *(Delhi 2011C)*

Q16 If A is a square matrix such that $A^2 = A$, then $(I - A)^3 + A$ is equal to
a) I   (b) 0   (c) I – A   (d) I + A
(2020)

Q17 If A is a square matrix such that $A^2 = I$, then find the simplified value of $(A - I)^3 + (A + I)^3 - 7A$.
(Delhi 2016)

Q18 If $[2\,1\,3]\begin{bmatrix} -1 & 0 & -1 \\ -1 & 1 & 0 \\ 0 & 1 & 1 \end{bmatrix}\begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix} = A$, then write the order of matrix A. *(Foreign 2016)*

Q19 Solve the following matrix equation of x:
$[x\ 1]\begin{bmatrix} 1 & 0 \\ -2 & 0 \end{bmatrix} = O$ *(Delhi 2014)*

Q20 If $2\begin{bmatrix} 3 & 4 \\ 5 & x \end{bmatrix} + \begin{bmatrix} 1 & y \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 7 & 0 \\ 10 & 5 \end{bmatrix}$, find   (x – y). *(Delhi 2014)*

Q21 If A is a square matrix such that $A^2 = A$, then write the value of $7A - (I + A)^3$, where I is an identity matrix. *(AI 2014)*

Q22 If $(2x\ \ 4)\begin{bmatrix} x \\ -8 \end{bmatrix} = O$, find the positive value of x. *(AI 2014C)*

Q23 If $\begin{bmatrix} 9 & -1 & 4 \\ -2 & 1 & 3 \end{bmatrix} = A + \begin{bmatrix} 1 & 2 & -1 \\ 0 & 4 & 9 \end{bmatrix}$, then find the matrix A. *(Delhi 2013)*

Q24 If matrix $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$ and $A^2 = kA$, then write the value of k. *(AI 2013)*

Q25 If matrix $A = \begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$ and $A^2 = pA$, then write the value of p. *(AI 2013)*

Q26 If matrix $A = \begin{bmatrix} 3 & -3 \\ -3 & 3 \end{bmatrix}$ and $A^2 = \lambda A$, then write the value of λ. *(AI 2013)*

Q27 If $2\begin{bmatrix} 1 & 3 \\ 0 & x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}$, then write the value of (x +y). *(Delhi 2013C, AI 2012)*

Q28 Simplify :

$$\cos\theta\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix} + \sin\theta\begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$$

(Delhi 2012)

Q29 If $\begin{bmatrix} 2 & 3 \\ 5 & 7 \end{bmatrix}\begin{bmatrix} 1 & -3 \\ -2 & 4 \end{bmatrix} = \begin{bmatrix} -4 & 6 \\ -9 & x \end{bmatrix}$, write the value of x. *(Delhi 2012)*

Q30 Find the value of x + y from the following equation:

$$\begin{bmatrix} x & 5 \\ 7 & y-3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}$$ *(AI 2012)*

Q31 If $3A - B = \begin{bmatrix} 5 & 0 \\ 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 3 \\ 2 & 5 \end{bmatrix}$, then find the matrix A. *(Delhi 2012C)*

Q32 Find a matrix A such that 2A – 3B + 5C = O, where

$$B = \begin{bmatrix} -2 & 2 & 0 \\ 3 & 1 & 4 \end{bmatrix} \text{ and } C = \begin{bmatrix} 2 & 0 & -2 \\ 7 & 1 & 6 \end{bmatrix}$$

(Delhi 2019)

Q33 Let $A = \begin{pmatrix} 2 & -1 \\ 3 & 4 \end{pmatrix}$, $B = \begin{pmatrix} 5 & 2 \\ 7 & 4 \end{pmatrix}$, $C = \begin{pmatrix} 2 & 5 \\ 3 & 8 \end{pmatrix}$, find a matrix D such that CD – AB = O.

(Delhi 2017)

Q34 Find matrix A such that

$$\begin{bmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{bmatrix} A = \begin{bmatrix} -1 & -8 \\ 1 & -2 \\ 9 & 22 \end{bmatrix}$$

(AI 2017)

Q35 If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$ find A^2 – 5A +4I and hence find a matrix X such that A^2 – 5A + 4I + X = O

(Delhi 2015)

Q36 Three schools A, B and C organized a mela for collecting funds for helping the rehabilitation of flood victims. They sold hand made 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 below.

Article/School	A	B	C
Hands – fans	40	25	35
Mats	50	40	50
Plates	20	30	40

Find the funds collected by each school separately by selling the above articles. Also, find the total funds collected for the purpose. Write one value generated by the above situation. *(Delhi 2015)*

Q37 To promote the making of toilets for women, an organization tried to generate awareness through (i) house calls (ii) letters and (iii) announcements. The cost for each mode per attempt is given below :

(i) Rs. 50   (ii) Rs. 20   (iii) Rs. 40

The number of attempts made in three villages X, Y and Z are given below:

	(i)	(ii)	(iii)
X	400	300	100
Y	300	250	75
Z	500	400	150

Find the total cost incurred by the organization for the three villages separately, using matrices. Write one value generated by the organization in the society. *(AI 2015)*

Q38 If $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} a & 1 \\ b & -1 \end{bmatrix}$ and $(A + B)^2 = A^2 + B^2$, then find the values of a and b.

(Foreign 2015)

Q39 In a parliament election, a political party hired a public relations firm to promote its candidates in three ways – telephone, house calls and letters. The cost per contact (in paise) is given in matrix A as

$$A = \begin{bmatrix} 140 \\ 200 \\ 150 \end{bmatrix} \begin{matrix} Telephone \\ House\,call \\ Letters \end{matrix}$$

The number of contacts of each type made in two cities X and Y is given in matrix B as

$$\begin{matrix} Telephone & Hou\,se\,call & Letters \end{matrix}$$
$$B = \begin{bmatrix} 1000 & 500 & 5000 \\ 3000 & 1000 & 10000 \end{bmatrix} \begin{matrix} City\,X \\ City\,Y \end{matrix}$$ Find the total amount spent by the party in the two cities.

What should one consider before casting his/her vote-party's promotional activity or their social activities?
(Foreign 2015)

Q40 If $\begin{bmatrix} 2x & 3 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ -3 & 0 \end{bmatrix} \begin{bmatrix} x \\ 3 \end{bmatrix} = O$, find x.
(Delhi 2015C)

Q41 A trust fund, Rs. 35,000 is to be invested in two different types of bonds. The first bond pays 8% interest per annum which will be given to orphanage and second bond pays 10% interest per annum which will be given to an N.G.O. (Cancer Aid Society). Using matrix multiplication determine how to divide Rs. 35,000 among to two types of bonds if the trust fund obtains an annual total interest of Rs. 3,200. What are the values reflected in this question? *(AI 2015C)*

Q42 If A is a matrix of order 3 × 2, then the order of the matrix A′ is _____. *(2020)*

Q43 If $A^T = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 & 1 \\ 1 & 2 & 3 \end{bmatrix}$, then find $A^T - B^T$. *(AI 2012)*

Q44 A square matrix A is said to be skew – symmetric, if _____. *(2020)*

Q45 If the matrix $A = \begin{bmatrix} 0 & a & -3 \\ 2 & 0 & -1 \\ b & 1 & 0 \end{bmatrix}$ is skew symmetric, find the values of 'a' and 'b'.

(2018)

Q46 Matrix $A = \begin{bmatrix} 0 & 2b & -2 \\ 3 & 1 & 3 \\ 3a & 3 & -1 \end{bmatrix}$ is given to be symmetric, find values of a and b.
(Delhi 2016)

Q47 If $A = \begin{bmatrix} 3 & 5 \\ 7 & 9 \end{bmatrix}$ is written as A = P + Q, where P is a symmetric matrix and Q is a skew symmetric matrix, then write the matrix P. *(Foreign 2016)*

Q48 Express the matrix $A = \begin{bmatrix} 2 & 4 & -6 \\ 7 & 3 & 5 \\ 1 & -2 & 4 \end{bmatrix}$ as the sum of a symmetric and a skew symmetric matrix.
(AI 2015C)

Q49 Write a 2 × 2 matrix which is both symmetric and skew symmetric.
(Delhi 2014C)

Q50 For what value of x, is the matrix $A = \begin{bmatrix} 0 & 1 & -2 \\ -1 & 0 & 3 \\ x & -3 & 0 \end{bmatrix}$, a skew – symmetric matrix?
(AI 2013)

Q51 If A and B are symmetric matrices, such that AB and BA are both defined, then prove that AB – BA is a skew symmetric matrix.
(AI 2019)

Q52   Show that all the diagonal elements of a skew symmetric matrix are zero. *(Delhi 2017)*

Q53   Use elementary column operation $C_2 \rightarrow C_2 + 2C_1$ in the following matrix equation:

$$\begin{pmatrix} 2 & 1 \\ 2 & 0 \end{pmatrix} = \begin{pmatrix} 3 & 1 \\ 2 & 0 \end{pmatrix}\begin{pmatrix} 1 & 0 \\ -1 & 1 \end{pmatrix} \qquad \textit{(AI 2016)}$$

Q54   Use elementary column operation $C_2 \rightarrow C_2 - 2C_1$ in the matrix equation

$$\begin{pmatrix} 4 & 2 \\ 3 & 3 \end{pmatrix} = \begin{pmatrix} 1 & 2 \\ 0 & 3 \end{pmatrix}\begin{pmatrix} 2 & 0 \\ 1 & 1 \end{pmatrix}. \qquad \textit{(Foreign 2014)}$$

Q55   Obtain the inverse of the following matrix using elementary operations :

$$A = \begin{bmatrix} 2 & 1 & -3 \\ -1 & -1 & 4 \\ 3 & 0 & 2 \end{bmatrix} \qquad \textit{(2020)}$$

Q56   Find the inverse of the following matrix using elementary operations

$$A = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix} \qquad \textit{(Delhi 2019)}$$

Q57   Using elementary row transformations, find the inverse of the matrix $\begin{bmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{bmatrix}$

(AI 2019)

Q58   Using elementary row transformations, find the inversed of the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ -2 & -4 & -5 \end{bmatrix} \qquad \textit{(2018)}$$

Q59   Using elementary operations, find the inverse of the following matrix :

$$\begin{bmatrix} -1 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix} \qquad \textit{(Dehli 2012)}$$

Q60   Using elementary transformations, find the inverse of the matrix.

$$\begin{pmatrix} 1 & 3 & -2 \\ -3 & 0 & -1 \\ 2 & 1 & 0 \end{pmatrix}$$

<u>Music</u>

1. **परिभाषाएँ**: (अलंकार, कण, मिड़, खटका, मुर्कि, गमक, ग्राम, मूर्छना, अलाय, तान) कॉपी में लिखो और याद करो।
2. रागो के समय और सिद्धांत के बारे में लिखना है और याद करना है।
3. संगीत रतनाकर, संगीत पारिजात दोनो गरंत को अपनी कॉपी में लिखो और याद करो।
4. जीवनियाँ - फयाज खान व बड़े गुलाम अली खान, क्रिश्न राव शंकर पंडित = इन सभी जीवनियों को कॉपी में लिखो और याद करो।
5. झपताल, रूपकताल, दमारताल = इन सभी तालो का परिचय और बोटेसन डायग्राम बनाके अपनी कॉपी में लिखो और याद करो।
6. तालपूरा मिलाने की विधि लिखो।
7. भैरव राग, बागेश्वरी राग और मालकोश राग = याद करो और इन्हें कॉपी में लिखो।