# PANCHSHEEL PUBLIC SCHOOL

10+2 Senior Secondary School (Affiliated & Recognized by CBSE)

Jaitpur, Badarpur, New Delhi-44

## MID-TERM REVISION PAPER
## SESSION 2023-24

**Time:**     **Subject: MATHS**     **Class: XII**     **Date:**     **M. Marks: 60**

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NOTE: Q. 1 to 15 each carry 1 mark ( MCQ)

Q. 16 to 20 each carry 2 marks.

Q. 21 to 24 each carry 3 marks.

Q. 25 and 26 each carry 4 marks.

Q.27 to 29 each carry 5 marks.

Q.1    The principal value of $\cot^{-1}(-\sqrt{3})$

a) $-\pi/6$          b) $\pi/6$          c) $2\pi/3$          d) $5\pi/6$

Q.2.  A and B are square matrices of same order, then AB' - BA' is a

a).   Symmetric matrix     b) skew symmetric matrix     c) zero matrix     d) Identity matrix

Q. 3.  The number of all potanssible matrices of order 2x3 with each entry 1 or 2 is

a) 16          b) 6          c) 64          d) 24

Q.4.If a matrix A is both symmetric and skew symmetric then A is necessarily a

a) Diagonal matrix.   b) zero matrix     c) square matrix.   d) Identity matrix

Q.5.  If A is a square matrix of order 3 and $|A| = 5$ , then the value of $|2A'|$ is

a) -10          b) 10          c) -40.          d) 40

Q.6.  The system of linear equations: 5x+ky =5 , 3x +3y = 5 will be consistent and independent if

a) $k \neq -3$          b) k=-5          c) k=5          $k \neq 5$

Q.7.  The range of the principal value of $\sec^{-1}x$ is

a). $(-\pi/2, \pi/2)$     b) $[-\pi/2, \pi/2] - \{0\}$   c) $[0, \pi] - \{\pi/2\}$          d) $(0, \pi)$

Q.8. Two matrices A and B will be inverse to each other only if

a) AB=BA       b) AB=BA =O       c) AB = O , BA = I       d) AB = BA = I

Q.9. If A is a square matrix of order 3, then which of the following is not true

a)  $|A'| = |A|$          b) $|kA| = k^3|A|$          c)  minor of an element of $|A|$ can never be equal cofactor of the same element          d) None of these

Q.10. If A is square matrix of order 3 and $|A| = -5$, then $|adj A|$ is

a) 125          b) -25          c) 25          d) -125

Q.11.  Let A= {1,2,3} and consider the relation R= {(1,1), (2,2), (3,3),(1,2),(2,3),(1,3)}. Then R is

a) Reflexive but not symmetric.                    b) Reflexive but not transitive

c) Symmetric and transitive                    d) Neither matric Nor transitive

Q.12. Every invertible function is

   a) monotonic function.   b)  constant function    c) identity function        d) none of these

Q.13. The principal value of tan⁻¹(tan 3π/5)

   a) $2\pi/5$.            b) $-2\pi/5$            c) $3\pi/5$            d) $-3\pi/5$

Q. 14.  If A is a square matrix of order 3 and $|A| = 5$ , then the value of $|2A'|$ is

   a) -10                b) 10                c) -40.                d) 40

Q.15. The system of linear equations: $5x+ky = 5$ , $3x +3y = 5$ will be consistent and independent if

   a) $k \neq -3$            b) $k=-5$            c) $k=5$                $k \neq 5$

Q.16. Find the values of x if the area of triangle with vertices (x,4) , (2,-6) and (5,4) is 35 sq. units.

Q.17. Find the inverse of the matrix

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \alpha & \sin \alpha \\ 0 & \sin \alpha & -\cos \alpha \end{bmatrix}.$$

Q.18. Find the value of  $\sin 3\pi/2$ - sin ( sec⁻¹t + cosec⁻¹t ) where $|t| \geq 1$.

Q. 19. Using principal values, evaluate:  $\cos^{-1}( \cos 2\pi/3) + \sin^{-1}( \sin 2\pi/3 )$

Q.20.  Express the following matrix as the sum of symmetric and skew symmetric matrix.

$$\begin{bmatrix} 2 & 4 & -6 \\ 7 & 3 & 5 \\ 1 & -2 & 4 \end{bmatrix}$$

Q.21. Define the followings with suitable example .

   a) Singular and non singular matrix.   b).  Symmetric and skew symmetric matrix

   c) Scalar matrix

Q.22. Write   in simplest form of   tan⁻¹( cos x / 1+sin x )

                                 OR

                        cot⁻¹ [ 1/ √(x²-1)]

Q.23. Solve the following Equation for x

        sin⁻¹4x + sin⁻¹3x = -π/2

Q.24. Find dy/ dx if

     1) x= a sec t ,  y= b tan t       2) y = log tan ( π/4+x/2)

Q.25.  send is pouring from A pipe at the rate of 12 cm cube per second. The falling sand form A cone on the ground in such a way that the height of the cone is always one- sixth of the radius of the base. How fast is the height of the sand cone increasing when the height is 4 cm.

Q.26. Prove that f(x) = 4 sin x/(2+cos x) -x is an increasing function of x in [0,π/2]

Q.27. Solve the following system of equations by matrix method

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

Q.28. If the sum of the length of the hypotenuse and side of a right angled triangle is given. Show that the area of the triangle is maximum when the angle between them is $\pi/3$

Q.29. Show that the function f defined by f(x) = |1-x+|x||  is everywhere continuous