DELHI PUBLIC SCHOOL , JAMMU

REVISION SHEET FOR CYCLE TEST 1

SESSION 2018-19

CLASS – XII **SUBJECT- MATHEMATICS**

TOPICS:

- **RELATION AND FUNCTION**
- **INVERSE TRIGONOMETRIC FUNCTIONS**
- **MATRICES**
- **DETERMINANTS**

VERY SHORT QUESTIONS

1.Let S={a,b,c}, find the total number of binary operations on S.

2.If sin($\sin^{-1}\frac{1}{2} + \cos^{-1}x$) = 1, then find the value of x

3.If $\begin{bmatrix}1 & 2\\3 & 4\end{bmatrix}\begin{bmatrix}3 & 1\\2 & 5\end{bmatrix}$ = $\begin{bmatrix}7 & 11\\k & 23\end{bmatrix}$,then find the value of k.

4. If A is a square matrix of order 3 such that $|adj\ A|$ = 64, then find $|A|$

5. Find the value of $\sin^{-1}\left(sin\frac{4\pi}{5}\right)$

(B) **SHORT QUESTIONS**

6. Let A = {x∈R:-1$\leq x \leq$ 1}=B.Show that f:A→ B given by f(x) = x$|x|$ is a bijection.

7.Write $\cot^{-1}\left(\frac{1}{\sqrt{x^2-1}}\right)$,$|x| > 1$ in simplest form.

8.Express the matrix A = $\begin{bmatrix}1 & 3 & 5\\-6 & 8 & 3\\-4 & 6 & 5\end{bmatrix}$ as the sum of a symmetric and a skew-symmetric matrix

9. Find the value of α so that the points (1,-5),(-4,5) and (α,7) are collinear.

10. If the operation * on Q-{1}, defined by a*b= a+b-ab for all a,b ∈ Q-{1},then a) is * commulative b) is * associative c)find the identity element d) Find the inverse of a for each a∈Q-{1}

11.Show that: tan$\left(\frac{1}{2}\sin^{-1}\frac{3}{4}\right)$ = $\frac{4-\sqrt{7}}{3}$

12. f A = $\begin{bmatrix} o & -tan\frac{\propto}{2} \\ tan\frac{\propto}{2} & 0 \end{bmatrix}$ and I is the identity matrix of order 2, then show that:

I +A = (I-A)$\begin{bmatrix} cos \propto & -sin \propto \\ sin \propto & cos \propto \end{bmatrix}$

13. Using properties of determinant, prove that: $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix}$ = ab+bc+ca+abc

14. Show that A = $\begin{bmatrix} 2 & -3 \\ 3 & 4 \end{bmatrix}$ satisfies the equation x^2-16x+17=0. Hence find A^{-1}

15. Solve for x: $\cos^{-1}\frac{x^2-1}{x^2+1} + \tan^{-1}\frac{2x}{x^2-1} = \frac{2\pi}{3}$

16. Show that f:N→N, given by $f(x) = \begin{cases} x+1, & xis\ odd \\ x-1, & x\ is\ even \end{cases}$ is both one one and onto.

LONG QUESTIONS

17. Consider f:R+→ $[5, \infty)$ given by f(x) = $9x^2$+6x-5. Show that f is invertible and f^{-1}(y) = $\left(\frac{\sqrt{y+6}-1}{3}\right)$.

18.Prove that :$\tan\left(\frac{\pi}{4} + \frac{1}{2}\cos^{-1}\frac{a}{b}\right) + tan\left(\frac{\pi}{4} - \frac{1}{2}\cos^{-1}\frac{a}{b}\right)$ = $\frac{2b}{a}$

19. Use product $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}\begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$. To solve the system of equations:

x-y+2z=1,2y-3z=1,3x-2y+4z=2.

20. Find the inverse of the matrix A = $\begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$ using elementary operations.

21. Given a non empty set X .Let * : P(X) X P(X) →P(X) be defined asA*B =(A-B)U(B-A) for all A,B E P(X).Show that the empty set Ø is the identity element and all the elements A of P(x) are invertible with A^{-1} = A.