	BCM SCHOOL BASANT AVENUE DUGRI ROAD LUDHIANA **HOLIDAY HOMEWORK** **CLASS XIISC**
1	Find the matrix A satisfying the matrix equation: $\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} A \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
2	Find the matrix A such that $\begin{bmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{bmatrix} A = \begin{bmatrix} -1 & -8 & -10 \\ 1 & -2 & -5 \\ 9 & 22 & 15 \end{bmatrix}$.
3	**If A, B are square matrices of same order and B is a skew - symmetric matrix, show that A'BA is skew symmetric.**
4	If $y = (\cos x)^{(\cos x)^{(\cos x)\ldots\infty}}$, show that $\frac{dy}{dx} = \frac{y^2 \tan x}{y \log \cos x - 1}$
5	If $A = \frac{1}{\pi}\begin{bmatrix} \sin^{-1}(x\pi) & \tan^{-1}\left(\frac{x}{\pi}\right) \\ \sin^{-1}\left(\frac{x}{\pi}\right) & \cot^{-1}(\pi x) \end{bmatrix}, B = \frac{1}{\pi}\begin{bmatrix} -\cos^{-1}(x\pi) & \tan^{-1}\left(\frac{x}{\pi}\right) \\ \sin^{-1}\left(\frac{x}{\pi}\right) & -\tan^{-1}(\pi x) \end{bmatrix}$, then A - B is equal to
6	**Consider f: $R^+ \rightarrow [-5, \infty)$ given by $f(x) = 9x^2 + 6x - 5$. Show that f is invertible with $f^{-1}(y) = \left(\frac{\sqrt{y+6}-1}{3}\right)$. Hence find (i) $f^{-1}(10)$ (ii) if $^{-1}(y) = 43$**
7	Given $A = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}, B = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$, find BA and use this to solve the system of equations y + 2z = 7, x - y = 3, 2x + 3y + 4z = 17.
8	If $x = a.sin(2t).(1 + cos2t)$ and $y = b.cos2t.(1 - cos2t)$, show that $\left(\frac{dy}{dx}\right)_{at\ t=\frac{\pi}{4}} = \frac{b}{a}$
9	**Given**

	$A=\begin{bmatrix}1 & -1 & 1\\ 1 & -2 & -2\\ 2 & 1 & 3\end{bmatrix}$ and $B=\begin{bmatrix}-4 & 4 & 4\\ -7 & 1 & 3\\ 5 & -3 & -1\end{bmatrix}$ **find AB and use this result in solving the following system of equation.** $x-y+z=4$ $x-2y-2z=9$ $2x+y+3z=1$
10	If $\sqrt{1-x^2}+\sqrt{1-y^2}=a(x-y)$, prove that $\frac{dy}{dx}=\sqrt{\frac{1-y^2}{1-x^2}}$ **If**
11	**The sum of three no. is 6. If we multiply third no. by 3 and add second no. to it, we get II. By adding first and third no. we get double of the second no. represent it algebraically and find the no. using matrix method.**
12	**Find the value of K so that function is continuous at the given value.** $f(x)=\begin{cases}Kx+1 & \text{if } x\le\pi\\ & \text{at } x=\pi\\ \cos x & \text{if } x>\pi\end{cases}$
13	**Differentiate the following w.r.t. to x** $\tan^{-1}\left(\frac{\sqrt{1+x}-\sqrt{1-x}}{\sqrt{1+x}+\sqrt{1-x}}\right)$ **(ii)** Differentiate w.r.t. x: $\sin^m x\cdot\cos^n x$
14	**(i)If** $x=a\sin pt,\ y=b\cos pt$ **, find the value of** $\frac{d^2y}{dx^2}$ **at t = 0** **(ii)** Differentiate w.r.t. x: $\cos^{-1}\left(\frac{\sin x+\cos x}{\sqrt{2}}\right);\ where\ \frac{-\pi}{4}<x<\frac{\pi}{4}$
15	Let $f(x)=\begin{cases}\frac{1-\cos 4x}{x^2},\ if\ x<0\\ =a,\ if\ x=0\\ \frac{\sqrt{x}}{\sqrt{16+\sqrt{x}}-4},\ if\ x>0\end{cases}$. For what value of a, f is continuous at x = 0?