INDIAN SCHOOL DARSAIT
DEPARTMENT OF MATHEMATICS

Subject :MATHEMATICS **Topic :DETERMINANTS -NO:4** **Date :7-5-2017**

Resource Person:PremelaIsac **Date of submission :14-5-2017**

Name of the Student: _____ **Class &Division:Roll. Number:**

Sl.No.	Questions	Marks
1.	Using properties of determinants prove the following: i) $\begin{vmatrix} a & a+b & a+2b \\ a+2b & a & a+b \\ a+b & a+2b & a \end{vmatrix} = 9b^2(a+b)$	4
2.	If $A=\begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$, then find the value of $A^2 - 3A + 2I$. Hence find A^{-1}.	4
3.	If a, b, c are positive and unequal, show that the following determinant is negative $\Delta=\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$	4
4.	For what value of k, the matrix $\begin{bmatrix} k & 2 \\ 3 & 4 \end{bmatrix}$ has no inverse?	1
5.	Find the matrix X for which $\begin{bmatrix} 1 & -4 \\ 3 & -2 \end{bmatrix} X = \begin{bmatrix} -16 & -6 \\ 7 & 2 \end{bmatrix}$.	2
6.	Using properties of determinants show that $\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix} = a^3$	4
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 it to solve the system $y+2z=7$, $x-y=3, 2x+3y+4z=17$.	6
8.	Using properties of determinants show that if $\begin{vmatrix} 3 & -2 & \sin\theta & 3\theta \\ -7 & 8 & \cos\theta & 2\theta \\ -11 & 14 & 2 & \end{vmatrix} = 0$, then $\sin\theta = 0$ or $\frac{1}{2}$.	4
9.	Using properties of determinants show that $\begin{vmatrix} b+c & a-b & a \\ c+a & b-c & b \\ a+b & c-a & c \end{vmatrix} = 3a - a^3 - b^3 - c^3$.	4

10.	If A= $\begin{bmatrix} 1 & 2 & 0 \\ -2 & -1 & -2 \\ 0 & -1 & 1 \end{bmatrix}$ find A^{-1} using elementary transformations and use it to solve $x-2y=10$, $2x-y-z=8, -2y+z=7.$	6
11.	If $A=\begin{pmatrix} 2 & 3 \\ -1 & 2 \end{pmatrix}$ then show that $A^2-4A+7I=0$. Using this result find A^3 .	4
12.	If p,q,r are not in GP , and $\begin{vmatrix} 1 & \frac{q}{p} & \sim+\frac{q}{p} \\ 1 & \frac{r}{q} & \sim+\frac{r}{q} \\ p\sim+q & q\sim+r & 0 \end{vmatrix}$ = 0 , prove that $p\sim^2+2q\sim+r=0$	4
13.	In ΔABC , if $\Delta=\begin{vmatrix} 1 & 1 & 1 \\ \sin A & \sin B & \sin C \\ \sin A+\sin^2 A & \sin B+\sin^2 B & \sin C+\sin^2 C \end{vmatrix}=0$, then prove that the triangle ABC is isosceles.	4
14.	In the matrix equation $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}\begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}=\begin{bmatrix} 8 & 5 \\ 20 & 13 \end{bmatrix}$ apply $R_2 \to R_2-R_1$ and then apply $C_2 \to C_2-C_1$.	1
15.	If a,b and c are in A.P,Find the value of $\begin{vmatrix} 2y+4 & 5y+7 & 8y+a \\ 3y+5 & 6y+8 & 9y+b \\ 4y+6 & 7y+9 & 10y+c \end{vmatrix}$	4

Dear Children,
There is no substitute for hard work.
All the best. God Bless.