DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 8**

Topic :- DETERMINANTS

1. If $a+b+c=0$, then the solution of the equation $\begin{vmatrix} a-x & c & b \\ c & b-x & a \\ b & a & c-x \end{vmatrix}=0$ is

a) 0
b) $\pm\frac{3}{2}(a^2+b^2+c^2)$
c) $0,\ \pm\sqrt{\frac{3}{2}(a^2+b^2+c^2)}$
d) $0,\ \pm\sqrt{(a^2+b^2+c^2)}$

2. If a,b and c are all different from zero and $\Delta=\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix}=0$, then the value of $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}$ is

a) abc
b) $\frac{1}{abc}$
c) $-a-b-c$
d) -1

3. If $(\omega\neq 1)$ is a cubic root of unity, then $\begin{vmatrix} 1 & 1+i+\omega^2 & \omega^2 \\ 1-i & -1 & \omega^2-1 \\ -i & -1+\omega-i & -1 \end{vmatrix}$

a) zero
b) 1
c) i
d) ω

4. The value of $\sum_{n=1}^{N} U_n$ if $U_n=\begin{vmatrix} n & 1 & 5 \\ n^2 & 2N+1 & 2N+1 \\ n^3 & 3N^2 & 3N \end{vmatrix}$, is

a) 0
b) 1
c) -1
d) None of these

5. The integer represented by the determinant $\begin{bmatrix} 215 & 342 & 511 \\ 6 & 7 & 8 \\ 36 & 49 & 54 \end{bmatrix}$ is exactly divisible by

a) 146
b) 21
c) 20
d) 335

6. If A is a 3×3non-singular matrix, then det $(A^{-1}\text{adj } A)$ is equal to

a) det A
b) 1
c) $(\det A)^2$
d) $(\det A)^{-1}$

7. Let $A=\begin{vmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{vmatrix}$, where $0\leq\theta\leq 2\pi$, then the range of o$|A|$ is

a) (2, 4)
b) [2, 4]
c) [2, 4)
d) All of these

8. In a third order determinant, each element of the first column consists of sum of two terms, each element of the second column consists of sum of three terms and each element of the third column consists of sum of four terms. Then, it can be decomposed into n determinant, where n has the value

a) 1 b) 9 c) 16 d) 24

9. If $a_1, a_2, \ldots, a_n, \ldots$, are in GP, then the determinant

$$\Delta = \begin{vmatrix} \log a_n & \log a_{n+1} & \log a_{n+2} \\ \log a_{n+3} & \log a_{n+4} & \log a_{n+5} \\ \log a_{n+6} & \log a_{n+7} & \log a_{n+8} \end{vmatrix}$$ is equal to

a) 2 b) 4 c) 0 d) 1

10. If ω be a complex cube root of unity, then $\begin{vmatrix} 1 & \omega & -\omega^2/2 \\ 1 & 1 & 1 \\ 1 & -1 & 0 \end{vmatrix}$ is equal to

a) 0 b) 1 c) ω d) ω^2

11. $\begin{vmatrix} \log e & \log e^2 & \log e^3 \\ \log e^2 & \log e^3 & \log e^4 \\ \log e^3 & \log e^4 & \log e^5 \end{vmatrix}$ is equal to

a) 0 b) 1 c) $4\log e$ d) $5\log e$

12. The value of the determinant, $\begin{vmatrix} \sqrt{13}+\sqrt{3} & 2\sqrt{5} & \sqrt{5} \\ \sqrt{15}+\sqrt{26} & 5 & \sqrt{10} \\ 3+\sqrt{65} & \sqrt{15} & 5 \end{vmatrix}$ is

a) $5(\sqrt{6}-5)$ b) $5\sqrt{3}(\sqrt{6}-5)$ c) $\sqrt{5}(\sqrt{6}-\sqrt{3})$ d) $\sqrt{2}(\sqrt{7}-\sqrt{5})$

13. If $\Delta_1 = \begin{vmatrix} 10 & 4 & 3 \\ 17 & 7 & 4 \\ 4 & -5 & 7 \end{vmatrix}, \Delta_2 = \begin{vmatrix} 4 & x+5 & 3 \\ 7 & x+12 & 4 \\ -5 & x-1 & 7 \end{vmatrix}$ such that $\Delta_1 + \Delta_2 = 0$, is

a) $x = 5$ b) $x = 0$ c) x has no real value d) None of these

14. Let $\Delta = \begin{vmatrix} 1+x_1y_1 & 1+x_1y_2 & 1+x_1y_3 \\ 1+x_2y_1 & 1+x_2y_2 & 1+x_2y_3 \\ 1+x_3y_1 & 1+x_3y_2 & 1+x_3y_3 \end{vmatrix}$, then value of Δ is

a) $x_1x_2x_3 + y_1y_2y_3$ b) $x_1x_2x_3y_1y_2y_3$

c) $x_2x_3y_2y_3 + x_3y_1y_3y_1 + x_1x_2y_1y_2$ d) 0

15. If $\begin{vmatrix} a & a+d & a+2\,d \\ a^2 & (a+d)^2 & (a+2\,d)^2 \\ 2a+3\,d & 2(a+d) & 2a+d \end{vmatrix} = 0$, then

a) $d = 0$ b) $a + d = 0$ c) $d = 0$ or $a + d = 0$ d) None of these

16. Determinant $\begin{vmatrix} b^2-ab & b-c & bc-ac \\ ab-a^2 & a-b & b^2-ab \\ bc-ac & c-a & ab-a^2 \end{vmatrix}$ is equal to

a) $abc(a+b+c)$ b) $3a^2b^2c^2$ c) 0 d) None of these

17. If the system of equations

$bx+ay=c, cx+az=b, cy+bz=a$

has a unique solution, then

a) $abc=1$ b) $abc=-2$ c) $abc=0$ d) None of these

18. If ω is a cube root of unity, then $\begin{vmatrix} x+1 & \omega & \omega^2 \\ \omega & x+\omega^2 & 1 \\ \omega^2 & 1 & x+\omega \end{vmatrix}$, is equal to

a) x^3+1 b) $x^3+\omega$ c) $x^3+\omega^2$ d) x^3

19. If A and B are two matrices such that $A+B$ and AB are both defined, then

a) A and B are two matrices not necessarily of same order

b) A and B are square matrices of same order

c) Number of columns of $A =$ Number of rows of B

d) None of these

20. The coefficient of x in $f(x)=\begin{vmatrix} x & 1+\sin x & \cos x \\ 1 & \log(1+x) & 2 \\ x^2 & 1+x^2 & 0 \end{vmatrix}$, $-1<x\leq 1$, is

a) 1 b) -2 c) -1 d) 0