DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 1**

Topic :- DETERMINANTS

1. $\begin{vmatrix} b^2c^2 & bc & b+c \\ c^2a^2 & ca & c+a \\ a^2b^2 & ab & a+b \end{vmatrix}$ is equal to
a) $\frac{1}{abc}(ab+bc+ca)$ b) $ab+bc+ca$ c) 0 d) $a+b+c$

2. If $a^{-1}+b^{-1}+c^{-1}=0$ such that $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = \lambda$ then value of λ is
a) 0 b) abc c) $-abc$ d) None of these

3. If a, b, c, are in A.P., then the value of
$\begin{vmatrix} x+1 & x+2 & x+a \\ x+2 & x+3 & x+b \\ x+3 & x+4 & x+c \end{vmatrix}$, is
a) 3 b) -3 c) 0 d) None of these

4. $\begin{vmatrix} a-b & b-c & c-a \\ x-y & y-z & z-x \\ p-q & p-r & r-p \end{vmatrix}$ is equal to
a) $a(x+y+z)+b(p+q+r)+c$ b) 0
c) $abc+xyz+ppr$ d) None of the above

5. $\begin{vmatrix} a-b+c & -a-b+c & 1 \\ a+b+2c & -a+b+2c & 2 \\ 3c & 3c & 3 \end{vmatrix}$ is
a) $6ab$ b) ab c) $12ab$ d) $2ab$

6. In the determinant $\begin{vmatrix} 0 & 1 & -2 \\ -1 & 0 & 3 \\ 2 & -3 & 0 \end{vmatrix}$, the value of cofactor to its minor of the element -3 is
a) -1 b) 0 c) 1 d) 2

7. If ω is a cube root of unity, then for polynomial is
$\begin{vmatrix} x+1 & \omega & \omega^2 \\ \omega & x+\omega^2 & 1 \\ \omega^2 & 1 & x+\omega \end{vmatrix}$
a) 1 b) ω c) ω^2 d) 0

8. If $\begin{vmatrix} x+a & b & c \\ a & x+b & c \\ a & b & x+c \end{vmatrix} = 0$, then x equals
a) $a+b+c$ b) $-(a+b+c)$ c) $0, a+b+c$ d) $0, -(a+b+c)$

9. If a, b, c are the sides of a ΔABC and A, B, C are respectively the angles opposite to them, then

$\begin{vmatrix} a^2 & b\sin A & c\sin A \\ b\sin A & 1 & \cos(B-C) \\ c\sin A & \cos(B-C) & 1 \end{vmatrix}$ equals

a) $\sin A - \sin B \sin C$ b) abc c) 1 d) 0

10. If $D_r = \begin{vmatrix} 2^{r-1} & 3^{r-1} & 4^{r-1} \\ x & y & z \\ 2^n - 1 & (3^n-1)/2 & (4^n-1)/3 \end{vmatrix}$, then the value of $\sum_{r=1}^{n} D_r$ is equal to

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

11. If A, B and C are the angles of a triangle and $\begin{vmatrix} 1 & 1 & 1 \\ 1+\sin A & 1+\sin B & \sin C \\ \sin A + \sin^2 A & \sin B + \sin^2 B & \sin C + \sin^2 C \end{vmatrix} = 0$ then the triangle must be

a) Equilateral b) Isosceles c) Any triangle d) Right angled

12. Let $A = \begin{bmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{bmatrix}$, where $0 \le \theta < 2\pi$. Then, which of the following is not correct?

a) Det $(A) = 0$ b) Det $(A) \in (-\infty, 0)$ c) Det $(A) \in [2,4]$ d) Det $(A) \in [-2, \infty)$

13. $\begin{vmatrix} 1 & 5 & \pi \\ \log_e e & 5 & \sqrt{5} \\ \log_{10} 10 & 5 & e \end{vmatrix}$ is equal to

a) $\sqrt{\pi}$ b) e c) 1 d) 0

14. If $a^2 + b^2 + c^2 = -2$ and $f(x) = \begin{vmatrix} 1+a^2x & (1+b^2)x & (1+c^2)x \\ (1+a^2)x & (1+b^2x) & (1+c^2)x \\ (1+a^2)x & (1+b^2)x & (1+c^2x) \end{vmatrix}$, then $f(x)$ is a polynomial of degree

a) 2 b) 3 c) 0 d) 1

15. If $c < 1$ and the system of equations $x + y - 1 = 0, 2x - y - c = 0$ and $-bx + 3by - c = 0$ is consistent, then the possible real values of b are

a) $b \in \left(-3, \frac{3}{4}\right)$ b) $b \in \left(-\frac{3}{4}, 4\right)$ c) $b \in \left(-\frac{3}{4}, 3\right)$ d) None of these

16. The value of $\begin{vmatrix} 1 & 1 & 1 \\ (2^x + 2^{-x})^2 & (3^x + 3^{-x})^2 & (5^x + 5^{-x})^2 \\ (2^x - 2^{-x})^2 & (3^x - 3^{-x})^2 & (5^x - 5^{-x})^2 \end{vmatrix}$ is

a) 0 b) 30^x c) 30^{-x} d) 1

17. If A is an invertible matrix, then $\det(A^{-1})$ is equal to

a) $\det b(A)$ b) $\frac{1}{\det(A)}$ c) 1 d) None of these

18. If $a \neq 0, b \neq 0, c \neq 0$, then $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix}$ is equal to

a) abc b) $abc\left(1 + \frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$ c) 0 d) $1 + \frac{1}{a} + \frac{1}{b} + \frac{1}{c}$

19. If $f(x) = \begin{vmatrix} a & -1 & 0 \\ ax & a & -1 \\ ax^2 & ax & a \end{vmatrix}$, then $f(2x) - f(x)$ is equal to

a) ax b) $ax(2a + 3x)$ c) $ax(2 + 3x)$ d) None of these

20. If $\begin{vmatrix} -12 & 0 & \lambda \\ 0 & 2 & -1 \\ 2 & 1 & 15 \end{vmatrix} = -360$, then the value of λ is

a) -1 b) -2 c) -3 d) 4