DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 2**

Topic :- DETERMINANTS

1. If ω is a complex cube root of unity, then

$\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$ is equal to

a) -1 b) 1 c) 0 d) ω

2. The value of $\begin{vmatrix} {}^{10}C_4 & {}^{10}C_5 & {}^{11}C_m \\ {}^{11}C_6 & {}^{11}C_7 & {}^{12}C_{m+2} \\ {}^{12}C_8 & {}^{12}C_9 & {}^{13}C_{m+4} \end{vmatrix} = 0$, when m is equal to

a) 6 b) 5 c) 4 d) 1

3. If $\begin{vmatrix} 1 & 1 & 0 \\ 2 & 0 & 3 \\ 5 & -6 & x \end{vmatrix} = 29$, then x is

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

4. $\begin{vmatrix} \sin^2 x & \cos^2 x & 1 \\ \cos^2 x & \sin^2 x & 1 \\ -10 & 12 & 2 \end{vmatrix} =$

a) 0
b) $12\cos^2 x - 10\sin^2 x$
c) $12\sin^2 x - 10\cos^2 x - 2$
d) $10\sin 2x$

5. If A and B are square matrices of order 3 such that $|A| = -1$, $|B| = 3$ then $|3AB|$ is equal to

a) -9 b) -81 c) -27 d) 81

6. If a,b,c are non-zero real numbers, then the system of equations

$(\alpha + a)x + \alpha y + \alpha z = 0$

$\alpha x + (\alpha + b)y + \alpha z = 0$

$\alpha x + \alpha y + (\alpha + c)z = 0$

has a non-trivial solution, if

a) $\alpha^{-1} = -(a^{-1} + b^{-1} + c^{-1})$
b) $\alpha^{-1} = a + b + c$
c) $\alpha + a + b + c = 1$
d) None of these

7. The determinant $\begin{vmatrix} a & b & a\alpha - b \\ b & c & b\alpha - c \\ 2 & 1 & 0 \end{vmatrix}$ vanishes, if

a) a,b,c are in AP   b) $\alpha = \frac{1}{2}$ c) a,b,c are in GP   d) Both (b) or (c)

8. If -9 is a root of the equation $\begin{vmatrix} x & 3 & 7 \\ 2 & x & 2 \\ 7 & 6 & x \end{vmatrix} = 0$, then the other two roots are

a) 2, 7   b) -2, 7   c) 2, -7 d) -2, -7

9. If $ab + bc + ca = 0$ and $\begin{vmatrix} a - x & c & b \\ c & b - x & a \\ b & a & c - x \end{vmatrix} = 0$, then one of the value of x is

a) $(a^2 + b^2 + c^2)^{1/2}$ b) $\left[\frac{3}{2}(a^2 + b^2 + c^2)\right]^{1/2}$

c) $\left[\frac{1}{2}(a^2 + b^2 + c^2)\right]^{1/2}$ d) None of these

10. The roots of the equation $\begin{vmatrix} x - 1 & 1 & 1 \\ 1 & x - 1 & 1 \\ 1 & 1 & x - 1 \end{vmatrix} = 0$, are

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

11. $\begin{vmatrix} 1 & 2 & 3 \\ 1^3 & 2^3 & 3^3 \\ 1^5 & 2^5 & 3^5 \end{vmatrix}$ is equal to

a) 1!213   b) 1!3!5!   c) 6!   d) 9!

12. If $A = \begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$ and $|A^3| = 125$, then the value of $\alpha$is

a) ± 1 b) ± 2 c) ± 3 d) ± 5

13. The value of $\begin{vmatrix} x & 4 & y + z \\ y & 4 & z + x \\ z & 4 & x + y \end{vmatrix}$, is

a) 4   b) $x + y + z$ c) xyz d) 0

14. If A, B,C be the angles of a triangle, then $\begin{vmatrix} -1 & \cos C & \cos B \\ \cos C & -1 & \cos A \\ \cos B & \cos A & -1 \end{vmatrix}$ is equal to

a) 1   b) 0   c) $\cos A \cos B \cos C$ d) $\cos A + \cos B \cos C$

15. One factor of $\begin{vmatrix} a^2 + x & ab & ac \\ ab & b^2 + x & cb \\ ca & cb & c^2 + x \end{vmatrix}$ is

a) x^2

b) $(a^2+x)(b^2+x)(c^2+x)$
c) $\frac{1}{x}$
d) None of these

16. If $\begin{vmatrix} x+1 & x+2 & x+3 \\ x+2 & x+3 & x+4 \\ x+a & x+b & x+c \end{vmatrix} = 0$ then a, b,c are in

a) AP b) HP c) GP d) None of these

17. If $A = \begin{vmatrix} 1 & 0 & 0 \\ x & 1 & 0 \\ x & x & 1 \end{vmatrix}$ and $I = \begin{vmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{vmatrix}$, then

$A^3 - 4A^2 + 3A + I$ is equal to
a) $3I$ b) I c) $-I$ d) $-2I$

18. Determinant $\begin{vmatrix} 1 & x & y \\ 2 & \sin x + 2x & \sin y + 3y \\ 3 & \cos x + 3x & \cos y + 3y \end{vmatrix}$ is equal to

a) $\sin(x-y)$ b) $\cos(x-y)$ c) $\cos(x+y)$ d) $xy(\sin(x-y)$

19. If a,b,c are the positive integers, then the determinant $\Delta = \begin{vmatrix} a^2+x & ab & ac \\ ab & b^2+x & bc \\ ac & bc & c^2+x \end{vmatrix}$ is divisible by

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

20. If a,b,c are non-zero real numbers, then $\begin{vmatrix} bc & ca & ab \\ ca & ab & bc \\ ab & bc & ca \end{vmatrix}$ vanishes, when

a) $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=0$ b) $\frac{1}{a}-\frac{1}{b}-\frac{1}{c}=0$ c) $\frac{1}{b}+\frac{1}{c}-\frac{1}{a}=0$ d) $\frac{1}{b}-\frac{1}{c}-\frac{1}{a}=0$