DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 5**

Topic :- DETERMINANTS

1. If $\Delta(x) = \begin{vmatrix} x^n & \sin x & \cos x \\ n! & sin\frac{n\pi}{2} & \cos\frac{n\pi}{2} \\ a & a^2 & a^3 \end{vmatrix}$, then the value of $\frac{d^n}{dx^n}[\Delta(x)]$ at $x = 0$ is

a) -1 b) 0 c) 1 d) Dependent of a

2. For positive numbers x, y and z, the numerical value of the determinant $\begin{vmatrix} 1 & \log_x y & \log_x z \\ \log_y x & 1 & \log_y z \\ \log_z x & \log_z y & 1 \end{vmatrix}$ is

a) 0 b) 1 c) $\log_e xyz$ d) None of these

3. The value of the determinant $\begin{vmatrix} 15! & 16! & 17! \\ 16! & 17! & 18! \\ 17! & 18! & 19! \end{vmatrix}$ is equal to

a) $15! + 16!$ b) $2(15!)(16!)(17!)$ c) $15! + 16! + 17!$ d) $16! + 17!$

4. If $\Delta = \begin{vmatrix} 3 & 4 & 5 & x \\ 4 & 5 & 6 & y \\ 5 & 6 & 7 & z \\ x & y & z & 0 \end{vmatrix}$, then Δ equals

a) $(y - 2z + 3x)^2$
b) $(x - 2y + z)^2$
c) $(x + y + z)^2$
d) $x^2 + y^2 + z^2 - xy - yz - zx$

5. If the system of equations $2x + 3y + 5 = 0$, $x + ky + 5 = 0$, $kx - 12y - 14 = 0$ be consistent, then value of k is

a) $-2, \frac{12}{5}$ b) $-1, \frac{1}{5}$ c) $-6, \frac{17}{5}$ d) $6, -\frac{12}{5}$

6. If $\begin{vmatrix} b^2 + c^2 & ab & ac \\ ab & c^2 + a^2 & bc \\ ca & cb & a^2 + b^2 \end{vmatrix} = k\, a^2\, b^2\, c^2$, then k is equal to

a) 3 b) 2 c) 4 d) None of these

7. The repeated factor of the determinant $\begin{vmatrix} y+z & x & y \\ z+x & z & x \\ x+y & y & z \end{vmatrix}$, is

a) $z-x$ b) $x-y$ c) $y-z$ d) None of these

8. The determinant $\begin{vmatrix} 4+x^2 & -6 & -2 \\ -6 & 9+x^2 & 3 \\ -2 & 3 & 1+x^2 \end{vmatrix}$ is not divisible by

a) x b) x^3 c) $14+x^2$ d) x^5

9. If a,b,c are different, then the value of x satisfying $\begin{vmatrix} 0 & x^2-a & x^3-b \\ x^2+a & 0 & x^2+c \\ x^4+a & x-c & 0 \end{vmatrix} = 0$ is

a) a b) b c) c d) 0

10. Determinant $\begin{vmatrix} b^2+c^2 & a^2 & a^2 \\ b^2 & c^2+a^2 & b^2 \\ c^2 & c^2 & a^2+b^2 \end{vmatrix}$ is equal to

a) abc b) $4\,abc$ c) $4a^2b^2c^2$ d) $a^2b^2c^2$

11. If $a \neq p, b \neq q, c \neq r$ and $\begin{vmatrix} p & b & c \\ p+a & q+b & 2c \\ a & b & r \end{vmatrix} = 0$, then $\frac{p}{p-a} + \frac{q}{q-b} + \frac{r}{r-c}$ is equal to

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

12. $\begin{vmatrix} a+b+2c & a & b \\ c & 2a+b+c & b \\ c & a & a+2b+c \end{vmatrix}$ is equal to

a) $(a+b+c)^2$ b) $2(a+b+c)^2$
c) $(a+b+c)^3$ d) $2(a+b+c)^3$

13. If [ ] denotes the greatest integer less than or equal to the real number under consideration and $-1 \leq x < 0; 0 \leq y < 1; 1 \leq z < 2$, then the value of the determinant $\begin{vmatrix} [x]+1 & [y] & [z] \\ [x] & [y]+1 & [z] \\ [x] & [y] & [z]+1 \end{vmatrix}$ is

a) $[x]$ b) $[y]$ c) $[z]$ d) None of these

14. The values of x for which the given matrix $\begin{bmatrix} -x & x & 2 \\ 2 & x & -x \\ x & -2 & -x \end{bmatrix}$ will be non-singular, are

a) $-2 \leq x \leq 2$ b) For all x other then 2 and -2
c) $x \geq 2$ d) $x \leq -2$

15. If all the elements in a square matrix A of order 3 are equal to 1 or -1, then $|A|$, is

a) An odd number b) An even number c) An imaginary number d) A real number

16. Let a,b,c be such that $(b+c) \neq 0$ and

$$\begin{vmatrix} a & a+1 & a-1 \\ -b & b+1 & b-1 \\ c & c-1 & c+1 \end{vmatrix}$$

$$+\begin{vmatrix} a+1 & b+1 & c-1 \\ a-1 & b-1 & c+1 \\ (-1)^{n+2}a & (-1)^{n+1}b & (-1)^{n}c \end{vmatrix}^{1} = 0$$

Then the value of n is

a) Zero b) Any even integer c) Any odd integer d) Any integer

17. Determinant $\begin{vmatrix} 1/a & a^2 & bc \\ 1/b & b^2 & ca \\ 1/c & c^2 & ab \end{vmatrix}$ is equal to

a) abc b) $\frac{1}{abc}$ c) $ab+bc+ca$ d) 0

18. One root of the equation $\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix}=0$ is

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

19. The value of $\begin{vmatrix} a^2 & b^2 & c^2 \\ (a+1)^2 & (b+1)^2 & (c+1)^2 \\ (a-1)^2 & (b-1)^2 & (c-1)^2 \end{vmatrix}$ is

a) $4\begin{vmatrix} a^2 & b^2 & c^2 \\ a & b & c \\ 1 & 1 & 1 \end{vmatrix}$ b) $3\begin{vmatrix} a^2 & b^2 & c^2 \\ a & b & c \\ 1 & 1 & 1 \end{vmatrix}$ c) $2\begin{vmatrix} a^2 & b^2 & c^2 \\ a & b & c \\ 1 & 1 & 1 \end{vmatrix}$ d) None of these

20. The value of the determinant

$$\Delta = \begin{vmatrix} \frac{1-a_1^3 b_1^3}{1-a_1 b_1} & \frac{1-a_1^3 b_2^3}{1-a_1 b_2} & \frac{1-a_1^3 b_3^3}{1-a_1 b_3} \\ \frac{1-a_2^3 b_1^3}{1-a_2 b_1} & \frac{1-a_2^3 b_2^3}{1-a_2 b_2} & \frac{1-a_2^3 b_3^3}{1-a_2 b_3} \\ \frac{1-a_3^3 b_1^3}{1-a_3 b_1} & \frac{1-a_3^3 b_2^3}{1-a_3 b_2} & \frac{1-a_3^3 b_3^3}{1-a_3 b_3} \end{vmatrix}$$, is

a) 0

b) Dependent only on a_1,a_2,a_3

c) Dependent only on b_1,b_2,b_3

d) Dependent on a_1,a_2,a_3 b_1,b_2,b_3