DPP

DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**

DATE : **DPP NO. : 9**

Topic :- DETERMINANTS

1. The value of $\begin{vmatrix} a & a^2-bc & 1 \\ b & b^2-ca & 1 \\ c & c^2-ab & 1 \end{vmatrix}$, is

a) 1 b) -1 c) 0 d) $-abc$

2. The value of the determinant $\begin{vmatrix} 1 & \omega^3 & \omega^5 \\ \omega^3 & 1 & \omega^4 \\ \omega^5 & \omega^4 & 1 \end{vmatrix}$, where ω is an imaginary cube root of unity, is

a) $(1-\omega)^2$ b) 3 c) -3 d) None of these

3. Let a,b,c, be positive and not all equal, the value of the Determinant $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$ is

a) Positive b) Negative c) Zero d) None of these

4. 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

5. If $\begin{vmatrix} a & a^2 & 1+a^3 \\ b & b^2 & 1+b^3 \\ c & c^2 & 1+c^3 \end{vmatrix}$0 and vectors $(1,a,a^2)$,$(1,b,b^2)$and $(1,c,c^2)$are non-coplanar, then the product abc equals

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

6. ω is an imaginary cube root of unity and $\begin{vmatrix} x+\omega^2 & \omega & 1 \\ \omega & \omega^2 & 1+x \\ 1 & x+\omega & \omega^2 \end{vmatrix} = 0$, then one of the value of x is

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

7. if x,y,z are in A.P., then the value of the $\det(A)$ is, where

$$A=\begin{bmatrix}4\ 5\ 6\ x\\5\ 6\ 7\ y\\6\ 7\ 8\ z\\x\ y\ z\ 0\end{bmatrix}$$

a) 0 b) 1 c) 2 d) None of these

8. If $\alpha,\beta,\gamma \in R$, then the determinant $\Delta=\begin{vmatrix}(e^{i\alpha}+e^{-i\alpha})^2 & (e^{i\alpha}-e^{-i\alpha})^2 & 4\\(e^{i\beta}+e^{-i\beta})^2 & (e^{i\beta}-e^{-i\beta})^2 & 4\\(e^{i\gamma}+e^{-i\gamma})^2 & (e^{i\gamma}-e^{-i\gamma})^2 & 4\end{vmatrix}$ is

a) Independent of α,β and γ b) Dependent of α,β and γ
c) Independent of α,β only d) Independent of α,β only

9. If $a>0$, $b>0$, $c>0$ are respectively the p^{th}, q^{th}, r^{th} terms of a GP, then the value of the determinant
$\begin{vmatrix}\log a & p & 1\\\log b & q & 1\\\log c & r & 1\end{vmatrix}$, is

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

10. The sum of the products of the elements of any row of a determinant A with the cofactors of the corresponding elements is equal to

a) 1 b) 0 c) $|A|$ d) $\frac{1}{2}|A|$

11. If a,b,c,d,e and f are in GP, then the value of
$\begin{vmatrix}a^2 & d^2 & x\\b^2 & e^2 & y\\c^2 & f^2 & z\end{vmatrix}$

a) Depends on x and y b) Depends on x and z
c) Depends on y and z d) independents on x,y and z

12. The value of $\begin{vmatrix}1 & \log_x y & \log_x z\\\log_y x & 1 & \log_y z\\\log_z x & \log_z y & 1\end{vmatrix}$ is equal to

a) 0 b) 1 c) xyzd) $\log xyz$

13. The value of the determinant $\begin{vmatrix}1 & 1 & 1\\1 & 1-x & 1\\1 & 1 & 1+y\end{vmatrix}$ is equal to

a) $3-x+y$ b) $(1-x)(1+y)$ c) xy d) $-xy$

14. If $\begin{vmatrix}x & y & z\\-x & y & z\\x & -y & z\end{vmatrix}=kxyz$, then k is equal to

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

15. If $x=-5$ is a root of $\begin{vmatrix}2x+1 & 4 & 8\\2 & 2x & 2\\7 & 6 & 2x\end{vmatrix}=0$, then the other roots are

a) 3, 3, 5 b) 1, 3, 5 c) 1, 7 d) 2, 7

16. Let a,b,c be positive real numbers. The following system of equations in x,y and z
$\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{z^2}{c^2}=1, \frac{x^2}{a^2}-\frac{y^2}{b^2}+\frac{z^2}{c^2}=1, -\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$ has

a) No solution
b) Unique solution
c) Infinitely many solutions
d) Finitely many solutions

17. $\begin{vmatrix} 1+\sin^2\theta & \sin^2\theta & \sin^2\theta \\ \cos^2\theta & 1+\cos^2\theta & \cos^2\theta \\ 4\sin 4\theta & 4\sin 4\theta & 1+4\sin 4\theta \end{vmatrix}=0$, then $\sin 4\theta$ equals to

a) $1/2$ b) 1 c) $-1/2$ d) -1

18. If a, b, c are unequal what is the condition that the value of the determinant, $\Delta \equiv$
$\begin{vmatrix} a & a^2 & a^3+1 \\ b & b^2 & b^3+1 \\ c & c^2 & c^3+1 \end{vmatrix}$ is 0?

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

19. If $\alpha+\beta+\gamma=\pi$, then the value of the determinant
$\begin{vmatrix} e^{2i\alpha} & e^{-i\gamma} & e^{-i\beta} \\ e^{-i\gamma} & e^{2i\beta} & e^{-i\alpha} \\ e^{-i\beta} & e^{-i\alpha} & e^{2i\gamma} \end{vmatrix}$, is

a) 4 b) -4 c) 0 d) None of these

20. If $x^a y^b = e^m$, $x^c y^d = e^n$, $\Delta_1 = \begin{vmatrix} m & b \\ n & d \end{vmatrix}$, $\Delta_2 = \begin{vmatrix} a & m \\ c & n \end{vmatrix}$ and $\Delta_3 = \begin{vmatrix} a & b \\ c & d \end{vmatrix}$, then the values of x and y are respectively

a) $\frac{\Delta_1}{\Delta_3}$ and $\frac{\Delta_2}{\Delta_3}$ b) $\frac{\Delta_2}{\Delta_1}$ and $\frac{\Delta_3}{\Delta_1}$
c) $\log\left(\frac{\Delta_1}{\Delta_3}\right)$ and $\log\left(\frac{\Delta_2}{\Delta_3}\right)$ d) e^{Δ_1/Δ_3} and e^{Δ_2/Δ_3}