DETERMINANTS

PROPERTIES OF DETERMINANTS

EXERCISE

Q.1 The determinant $\begin{vmatrix} a_1 & ma_1 & b_1 \\ a_2 & ma_2 & b_2 \\ a_3 & ma_3 & b_3 \end{vmatrix}$ value is -

(A) 0 (B) $ma_1a_2a_3$ (C) $ma_1b_2a_2$ (D) $mb_1b_2b_3$

Q.2 If the determinant is denoted by $\Delta = \begin{vmatrix} a & 0 & 0 \\ b & c & a \\ c & a & b \end{vmatrix}$, then $\begin{vmatrix} p^2a & 0 & 0 \\ pb & c & a \\ pc & a & b \end{vmatrix}$ is equal to-

(A) $p\Delta$ (B) $p^2\Delta$ (C) $p^3\Delta$ (D) $2p\Delta$

Q.3 the determinant $\begin{vmatrix} \frac{1}{a} & 1 & bc \\ \frac{1}{b} & 1 & ca \\ \frac{1}{c} & 1 & ab \end{vmatrix}$ value is equal to

(A) abc (B) $\frac{1}{abc}$ (C) 0 (D) None of these

Q.4 If every row in a third-order determinant with a value of Δ is multiplied by 3, the new determinant's value is -

(A) Δ (B) 27 Δ (C) 21 Δ (D) 54 Δ

Q.5 Find the sum of infinite series $\begin{vmatrix} 1 & 2 \\ 6 & 4 \end{vmatrix} + \begin{vmatrix} \frac{1}{2} & 2 \\ 2 & 4 \end{vmatrix} + \begin{vmatrix} \frac{1}{4} & 2 \\ \frac{2}{3} & 4 \end{vmatrix} + \ldots\ldots$

(A) –10 (B) 0 (C) 10 (D) ∞

Q.6 Evaluate $\begin{vmatrix} a & ma+nx & x \\ b & mb+ny & y \\ c & mc+nz & z \end{vmatrix}$

(A) a + b + c (B) x + y + z

(C) m(a + b + c) + n(x + y + z) (D) 0

Q.7 What is the value of $\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix}$

(A) a^3 (B) b^3 (C) c^3 (D) $a^3 + b^3 + c^3$

Q.8 Find the determinant $\begin{vmatrix} ka & k^2+a^2 & 1 \\ kb & k^2+b^2 & 1 \\ kc & k^2+c^2 & 1 \end{vmatrix}$ value.

(A) k (a + b) (b + c) (c + a) (B) k abc $(a^2 + b^2 + c^2)$

(C) k (a – b) (b – c) (c – a) (D) k (a + b – c) (b + c – a) (c + a – b)

Q.9 Find the value of $\sum_{r=1}^{n} \Delta_r$ If $\Delta_r = \begin{vmatrix} r & x & \frac{n(n+1)}{2} \\ 2r-1 & y & n^2 \\ 3r-2 & z & \frac{n(3n-1)}{2} \end{vmatrix}$, is given.

(A) $\frac{1}{6}$ n(n + 1)(2n + 1) (B) $\frac{1}{4}$ $n^2(n + 1)^2$

(C) 0 (D) None of these

Q.10 Given $\begin{vmatrix} a+x & a-x & a-x \\ a-x & a+x & a-x \\ a-x & a-x & a+x \end{vmatrix} = 0$, find the value of x.

(A) 0, a (B) 0, – a (C) a, – a (D) 0, 3a

ANSWER KEY

1. (A)

2. (B)

3. (C)

4. (B)

5. (A)

6. (D)

7. (A)

8. (C)

9. (C)

10. (D)