# DETERMINANTS

## PROPERTIES OF DETERMINANTS

## EXERCISE

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

(A) 0 (B) $ma_1a_2a_3$

(C) $ma_1b_2a_2$ (D) $mb_1b_2b_3$

**Q.2** If $\Delta = \begin{vmatrix} a & 0 & 0 \\ b & c & a \\ c & a & b \end{vmatrix}$, 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 value of the determinant $\begin{vmatrix} 1/a & 1 & bc \\ 1/b & 1 & ca \\ 1/c & 1 & ab \end{vmatrix}$ is equal to

(A) abc (B) 1/abc

(C) 0 (D) None of these

**Q.4** If each row of a determinant of third order of value $\Delta$ is multiplied by 3, then the value of new determinant is -

(A) $\Delta$ (B) 27 $\Delta$

(C) 21 $\Delta$ (D) 54 $\Delta$

**Q.5** The sum of infinite series $\begin{vmatrix} 1 & 2 \\ 6 & 4 \end{vmatrix} + \begin{vmatrix} 1/2 & 2 \\ 2 & 4 \end{vmatrix} + \begin{vmatrix} 1/4 & 2 \\ 2/3 & 4 \end{vmatrix} + \ldots\ldots$ is -

(A) –10 (B) 0

(C) 10 (D) $\infty$

**Q.6** The value of $\begin{vmatrix} a & ma+nx & x \\ b & mb+ny & y \\ c & mc+nz & z \end{vmatrix}$ is-

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

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

**Q.7** The value of $\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix}$ is equal to -

(A) $a^3$ (B) $b^3$

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

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

(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** If $D_r = \begin{vmatrix} r & x & n(n+1)/2 \\ 2r-1 & y & n^2 \\ 3r-2 & z & n(3n-1)/2 \end{vmatrix}$, then $\sum_{r=1}^{n} D_r$ is equal to -

(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** If $\begin{vmatrix} a+x & a-x & a-x \\ a-x & a+x & a-x \\ a-x & a-x & a+x \end{vmatrix} = 0$, then value of x are-

(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)