



## Determinants

### Q.No.1:

The number of values of  $k$ , for which the system of equations :

$$(k + 1)x + 8y = 4k$$

$$kx + (k + 3)y = 3k - 1$$

has no solution, is :

**JEE 2013**

- A. infinite
- B. 1
- C. 2
- D. 3

### Q.No.2:

If  $P = \begin{bmatrix} 1 & \alpha & 3 \\ 1 & 3 & 3 \\ 2 & 4 & 4 \end{bmatrix}$  is the adjoint of a  $3 \times 3$  matrix  $A$  and  $|A| = 4$ , then  $\alpha$  is equal

to:

**JEE 2013**

- A. 4
- B. 11
- C. 5
- D. 0

**Q.No.3:** The set of all values of  $\lambda$  for which the system of linear equations :

$$2x_1 - 2x_2 + x_3 = \lambda x_1$$

$$2x_1 - 3x_2 + 2x_3 = \lambda x_2$$

$$-x_1 + 2x_2 = \lambda x_3$$

has a non-trivial solution,

**JEE 2015**

- A. is an empty set
- B. is a singleton
- C. contains two elements

**D.** contains more than two elements

**Q.No.4:** The system of linear equations

$$x + \lambda y - z = 0$$

$$\lambda x - y - z = 0$$

$$x + y - \lambda z = 0$$

has a non-trivial solution for :

**JEE 2016**

- A.** exactly one value of  $\lambda$
- B.** exactly two values of  $\lambda$
- C.** exactly three values of  $\lambda$
- D.** infinitely many values of  $\lambda$

**Q.No.5:** If  $A = \begin{bmatrix} 5a & -b \\ 3 & 2 \end{bmatrix}$  and  $A \operatorname{adj} A = AA^T$ , then  $5a + b$  is equal to :

**JEE 2016**

- A.** 5
- B.** 4
- C.** 13
- D.** -1

**Q.No.6:** If S is the set of distinct values of 'b' for which the following system of linear equations

$$x + y + z = 1$$

$$x + ay + z = 1$$

$$ax + by + z = 0$$

has no solution, then S is :

**JEE 2017**

- A.** an empty set
- B.** an infinite set
- C.** a finite set containing two or more elements
- D.** a singleton

**Q.No.7:** If  $A = \begin{bmatrix} 2 & -3 \\ -4 & 1 \end{bmatrix}$ , then  $\operatorname{adj} (3A^2 + 12A)$  is equal to

**JEE 2017**

- A.**  $\begin{bmatrix} 72 & -84 \\ -63 & 51 \end{bmatrix}$

**B.**  $\begin{bmatrix} 51 & 63 \\ 84 & 72 \end{bmatrix}$

**C.**  $\begin{bmatrix} 51 & 84 \\ 63 & 72 \end{bmatrix}$

**D.**  $\begin{bmatrix} 72 & -63 \\ -84 & 51 \end{bmatrix}$

**Q.No.8:** If the system of linear equations

$$x + ky + 3z = 0$$

$$3x + ky - 2z = 0$$

$$2x + 4y - 3z = 0$$

has a non-zero solution  $(x, y, z)$  then  $\frac{xz}{y^2}$  is equal to :

**JEE 2018**

**A.** -30

**B.** 30

**C.** -10

**D.** 10

**Q.No.9:** If  $\begin{vmatrix} x-4 & 2x & 2x \\ 2x & x-4 & 2x \\ 2x & 2x & x-4 \end{vmatrix} = (A+Bx)(x-A)^2$ , then the ordered pair

$(A, B)$  is equal to :

**JEE 2018**

**A.**  $(-4, 5)$

**B.**  $(4, 5)$

**C.**  $(-4, -5)$

**D.**  $(-4, 3)$

**Q.No.10:** The system of linear equations

$$x + y + z = 2$$

$$2x + 3y + 2z = 5$$

$$2x + 3y + (a^2 - 1)z = a + 1$$

**JEE 2019**

**A.** is inconsistent when  $a = 4$

**B.** has a unique solution for  $|a| = \sqrt{3}$

**C.** has infinitely many solutions for  $a = 4$

**D.** is inconsistent when  $|a| = \sqrt{3}$