PARISHRAM 2026

Mathematics

DPP: 4

Determinants

Q1 A system of linear equations is said to be consistent if it has
(A) unique solutions
(B) Option (A) and (C)
(C) infinite solutions
(D) None of these

Q2 A system of linear equations is said to be inconsistent if it has
(A) unique solution
(B) 2 solutions
(C) infinite solutions
(D) no solution

Q3 If $\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} \neq 0$, then the number of solution of the system of equations $a_1x + b_1y + c_1z = 0, a_2x + b_2y + c_2z = 0$ and $a_3x + b_3y + c_3z = 0$ is
(A) Infinite number of solutions
(B) Only one unique solution
(C) More than one solution
(D) None of these

Q4 Find k for which system
2x + 3ky = –1
5x + 4y = 7
is having unique solution
(A) $k = \frac{2}{15}$
(B) $k = \frac{8}{15}$
(C) $k \neq \frac{2}{15}$
(D) $k \neq \frac{8}{15}$

Q5 The system
x + y – z = 2
2x + 3y – 4z = 3
–x + 2y + 3z = 9
is having
(A) unique solution
(B) infinite solutions
(C) no solution
(D) None of these

Q6 If A is singular matrix and (adj A)B ≠ 0, then
(A) there is unique solution
(B) solution does not exist
(C) there are infinitely many solutions
(D) None of the above

Q7 Find k for which system
kx – y + 2z = 3
x + 2y – 3z = 7
3x + 4y – 9z = 1
is having unique solution
(A) $k = \frac{1}{3}$
(B) $k = \frac{2}{3}$
(C) $k \neq \frac{-2}{3}$
(D) $k \neq \frac{-1}{3}$

Q8 Given, 2x – y + 2z = 2, x – 2y + z = –4 and x + y + λz = 4, then the value of λ such that the given system of equations has no solution is
(A) 3 (B) 1
(C) 0 (D) –3

Q9 The simultaneous equations
kx + 2y – z = 1,
(k – 1)y – 2z = 2,
(k + 2)z = 3
have only one solution when

(A) k = –2 (B) k = –1
(C) k = 0 (D) k = 1

Q10 For what value of p, the system of equations, px + 2y – z = 1, (p – 1)y – 2z = 2, (p + 2)z = 3 has only one solution?
(A) 0
(B) 1
(C) –2
(D) All real values except 0, 1, –2

Answer Key

Q1	B
Q2	D
Q3	B
Q4	D
Q5	A
Q6	B
Q7	C
Q8	B
Q9	B
Q10	D

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

A system of linear equations is said to be consistent if either it has only one solution or infinitely many solutions.

Video Solution:

Q2 Text Solution:

A system of linear equations is said to be inconsistent if and only if it has no solution.

Video Solution:

Q3 Text Solution:

As it is given to us that the determinant of the coefficient matrix is not equal to zero, therefore, system of equations has unique solution.

Video Solution:

Q4 Text Solution:

As system of equations has unique solution

$\therefore |A| \neq 0$

$\Rightarrow \begin{vmatrix} 2 & 3k \\ 5 & 4 \end{vmatrix} \neq 0$

$\Rightarrow 8 - 15k \neq 0$

$\Rightarrow k \neq \frac{8}{15}$

Video Solution:

Q5 Text Solution:

Lets calculate the determinant of the coefficient matrix i.e.

$\begin{vmatrix} 1 & 1 & -1 \\ 2 & 3 & -4 \\ -1 & 2 & 3 \end{vmatrix} = 1(9+8) - 1(6-4)$

$-1(4+3)$

= 17 – 2 – 7

= 17 – 9

= 8 ≠ 0

given system has unique solution.

Video Solution:

Q6 Text Solution:

If |A| = 0 and (adj A)B ≠ 0, then system of equations has no solution.

Video Solution:

Q7 Text Solution:

As the given system of equations has unique solution

$$\therefore \begin{vmatrix} k & -1 & 2 \\ 1 & 2 & -3 \\ 3 & 4 & -9 \end{vmatrix} \neq 0$$

$$\Rightarrow k(-18+12)-1(-9+9)+2(4-6) \neq 0$$

$$\Rightarrow -6k-4 \neq 0$$

$$\Rightarrow k \neq -\frac{2}{3}$$

Video Solution:

Q8 **Text Solution:**

The given system of equations will have no solution, if |A| = 0

$$\Rightarrow \begin{vmatrix} 2 & -1 & 2 \\ 1 & -2 & 1 \\ 1 & 1 & \lambda \end{vmatrix} = 0$$

$$\Rightarrow 2(-2\lambda-1)+(\lambda-1)+2(1+2)=0$$

$$\Rightarrow -3\lambda+3=0$$

$$\Rightarrow \lambda=1$$

Hence, the system has no solution for λ = 1.

Note: for λ = 1, (adj A) B ≠ 0

Video Solution:

Q9 **Text Solution:**

Given system of equations has unique solution, if

$$\begin{vmatrix} k & 2 & -1 \\ 0 & k-1 & -2 \\ 0 & 0 & k+2 \end{vmatrix} \neq 0$$

$$\Rightarrow k \neq -2, 0, 1$$

k = –1 is the required value.

Video Solution:

Q10 **Text Solution:**

The given system of equations has unique solution, if $\begin{vmatrix} p & 2 & -1 \\ 0 & p-1 & -2 \\ 0 & 0 & p+2 \end{vmatrix} \neq 0$

(p + 2)[p(p – 1) – 0] ≠ 0

p(p – 1)(p + 2) ≠ 0

p ≠ 0, 1, –2

Thus, p can be any real value except 0, 1, –2.

Video Solution: