JEE Main 2026: High-Weightage Problems in Matrices, Determinants, and Vectors with Fully Solved Sets

1. If A is a square matrix, the matrix A-1 exists only when:
    a. A is singular
    b. Determinant of A is zero
    c. Determinant of A is non- zero
    d. A is diagonal

Solution: Determinant of A is non- zero

2. If any two rows or columns of a determinants are identical, then its value is:
    a. 0
    b. 0
    c. Non-zero constant
    d. Undefined

Solution: 0

3. The determinant of an identity matrix of any order is:
    a. 0
    b. 1
    c. Equal to its order
    d. Undefined

Solution: 1

4. If a row or column of a determinant is multiplied by zero, then the determinant becomes:
    a. Same as before
    b. Negative of original
    c. Zero
    d. Doubled

Solution: Zero

5. Two vectors are said to be collinear if:
    a. They have equal magnitudes
    b. They are parallel to the same or opposite directions
    c. Their scalar product is zero
    d. They are perpendicular

Solution: They are parallel to the same or opposite directions

6. A bag has 3 red and 2 blue balls. One ball drawn at random. Probability it is red=?

Solution: ⅗

7. Distance between points A (1,0,0) and B (4,3,0) in 3D=?
Solution: 5

8. A triangle has legs 6 and 8. Find the radius r of its inscribed circle (inradius).

Solution: r= 2

9. A dice is thrown once. Probability of getting an even number= ?

Solution: 3/6= ½

10. The zero vector is the one which has:
    a. Zero magnitude or no direction
    b. Unit magnitude
    c. Infinite direction
    d. Constant magnitude

Solution: Zero magnitude or no direction

11. If two vectors are perpendicular, their dot product is:
    a. 1
    b. 0
    c. Undefined
    d. Equal

Solution: 0