**CHAPTER – 1 MATRIX AND DETERMINANT**

**SESSION – 1**

**1.1 - ADDITION OF MATRICES**

**LEVEL-1**

1. If A = and kA =, then the values of k, a, b are respectively.

a) -6, -12, -18 b) -6, 4, 9 c) -6, -4, -9 d) -6, 12, 18

**Key:** c

**Hint:** We have,



But, kA = 



⇒ 2k = 3a, 3k = 2b, -4k = 24 ⇒ k = -6, a = -4, b = -9

2. The value of x for which the matrix product equals an identity matrix, is

a) 1/2 b) 1/3 c) 1/4 d) 1/5

**Key:** d

**Hint:** We have,





⇒ 5x = 1, 10x – 2 = 0 

3. The matrix  is the matrix reflection in the line

a) x = 1 b) x + y = 1 c) y = 1 d) x = y

**Key:** d

**Hint:** 

Then, X = y and Y = x

i.e. y = x

4. If A is a square matrix of order 2  2 such that A2 = O, then

a) , where α, β, γ are numbers such that α2 + βy = 0

b)  with α = ±β

c)  with α2 + β2 = 1

d) None of the above

**Key:** a

**Hint:** If 





5. If , ,  and , then UV + XY =

a) 20 b) [20] c) [–20] d) –20

**Key:** b

**Hint:** 

= [6 – 6 + 4] + [0 + 4 + 12]

= [4] + [16]

= [20]

**LEVEL-2**

6. If the sum of the matrices A and  is 3I3 (I3 denotes the unit matrix of order 3) and then det {(Adj A). P-1} is equal to

a) -54 b) 1/54 c) 54 d) 1

**Key:** c

**Hint:** We have 



∴ det {(adj A). P-1}

= det(adj A)det(P-1)



**LEVEL-3**

7. If A = [aij] n×n, where aij = i100 + j100, then equals

a)  b)  c)  d)

**Key:** c

**Hint:** We have, aij = i100 + j100

⇒ aij = 2i100





8. The number of elements that a square matrix of order n has below its leading diagonal is

a)  b)  c)  d) 

**Key:** b

**Hint:** There are n2 elements in a square matrix of order n out of which n elements are in the leading diagonal. So, number of elements other than diagonal elements is (n2 – n). Half of these elements are above the diagonal and half are below the diagonal.

So, required number of elements is 

9. In a 4 × 4 matrix the sum of each row, column and both the main diagonals is α. Then the sum of the four corner elements

a) is also α b) may not be α c) is never equal to α d) none of these

**Key:** a

**Hint:** Let A = [aij] be a 4 × 4 matrix. If is given that

ai1 + ai2 + ai3 + ai4 = α for i = 1, 2, 3, 4

a1j + a2j + a3j + a4j = α for j = 1, 2, 3 , 4

a11 + a22 + a33 + a44 = α

and a14 + a23 + a32 + a41 = α

We have to find a11 + a14 + a41 + a44.

Clearly,

(a11 + a12 + a13+ a14) + (a41 + a42 + a43 + a44)

+ (a11 + a22 + a33 + a44) + (a14 + a23 + a32 + a41)

- (a12 + a22 + a32 + a42) – (a13 + a23 + a33 + a43)

= 2 (a11 + a14 + a41 + a44)

⇒ 4α - 2α = 2 (a11 + a14 + a41 + a44)

⇒ a11 + a14 + a41 + a44 = α