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**QUESTION**

Define THREE matrices A, B and C

(1). Find the linear transformation of A if vector x=(a, b, c)

(2). Find the rank of (B+C) transpose

(3). check whether A, B and C are singular or non singular

**Solution**

A= 4 3 -1 B= 2 7 1 C= 0 4 3

 2 0 5 0 -4 3 6 -7 1

 1 -1 6 5 2 8 1 -3 2

1. Given vector X= (a, b, c) to be (-1, 2, 5)

T(x)=A(x) = 4 3 -1 -1

 2 0 5 2

 1 -1 6 5

= -1 4 +2 3 +5 -1

 2 0 5

 1 -1 6

= -4 6 -5

 -2 + 0 + 25

 -1 -2 30

T(x)= -3

 23 hence, the transformation of -1

 27 2

 5

1. B+C = 2 11 4 (B+C)T= 2 6 6

 6 -11 4 11 -11 -1

 6 -1 10 4 4 10

=2 -11 -1 -6 11 -1 +6 11 -11

 4 10 4 10 4 4

=2( -110 +4) -6( 110+4) +6( 44+44)

 = -212 – 684 +528

= -368

Hence the rank of (B+C)T  is 3

1. A= 4 0 5 -3 2 5 -1 2 0

 -1 6 1 6 1 -1

= 4 ( 0 + 5) -3( 12-5) -1( -2-0)

= 20-21+2

= 1

**It is a non-singular matrix**

B= 2 -4 3 -7 0 3 +1 0 -4

 2 8 5 8 5 2

= 2( -32 -6) -7(0-15) +1(0+20)

= -76 +105 +20

= 49

**It is a non-singular matrix**

C= 0 -7 1 -4 6 1 +3 6 -7

 -3 2 1 2 1 -3

= 0( -14 + 3) -4( 12 -1)+3(-18+7)

= 0 -44 -12

=-56

**It is a non-singular matrix**