18/SCI01/074

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18/SCIO1/074

A $\begin{pmatrix} 1 & -3 & 6 \\ 4 & 0 & 2 \end{pmatrix}$ B $\begin{pmatrix} 1 & 1 & 2 \\ 1 & -2 & 1 \end{pmatrix}$ C $\begin{pmatrix} 0 & 4 & 3 \\ 6 & -7 & 1 \end{pmatrix}$

i. **RANK OF A**

|A|= $\begin{pmatrix} 1 & -3 & 6 \\ 4 & 0 & 2 \end{pmatrix}$

|A|= 1(0 - 10) +3 (4 - 16) + 6(20 - 0)

|A|= -10 - 36 + 120 = 74 IT IS NOT EQUAL TO 0; HENCE THE RANK OF **A** IS **3**

ii. **RANK OF B TRANSPOSE**

|B|= $\begin{pmatrix} 1 & 1 & 0 \\ 1 & -2 & 1 \end{pmatrix}$

|B|= 1(8 + 3) – 1(-4 - 6) + 0(1 + 4)

|B|= 5 + 10 + 0 = 15 IT IS NOT EQUAL TO 0; HENCE THE RANK OF **B TRANSPOSE** IS **3**

iii. **RANK OF (A + C) TRANSPOSE**

|A+C|= $\begin{pmatrix} 1 & 1 & 9 \\ 10 & - 7 & 3 \end{pmatrix}$

$$|A+C|^T = \begin{pmatrix} 1 & 10 & 9 \\ 1 & -7 & 2 \end{pmatrix}$$

|A+C|= 1(-21 - 6) – 10(3 - 18) + 9(3 + 63)

|A+C|= -27 + 150 + 594 = 717

IT IS NOT EQUAL TO 0; HENCE THE RANK OF **(A + C) TRANSPOSE** IS **3**

iv. RANK OF (B + C)

$$|B+C| = \begin{pmatrix} 1 & 5 & 5 \\ 7 & -9 & 2 \end{pmatrix}$$

|B+C|= 1(18 - 0) -5(-14 -2) + 5(0 + 9)

|B+C|= 18 + 80 + 45 = 143

IT IS NOT EQUAL TO 0; HENCE THE RANK OF (**B + C**) IS **3**

v. RANK OF (A+B+C)

$$|A+B+C| = \begin{pmatrix} 2 & 2 & 11 \\ 11 & -9 & 4 \end{pmatrix}$$

| A+B+C |= 2(9 - 20) – 2(-11 - 36) + 11(55 + 81)

| A+B+C |= -22 + 94 + 1496 = 1568

IT IS NOT EQUAL TO 0; HENCE THE RANK OF (**A+B + C**) IS **3**

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