

ISHOLA ABDULMALIK OLATUNDE

MAT 204

18/SCI01/040

COMP SCI

QUESTION 1

i. $|X| = \begin{vmatrix} 1 & 2 & 8 \\ 4 & 7 & 6 \\ 9 & 5 & 3 \end{vmatrix}$

$$|X| = 1(21 - 30) - 2(12 - 54) + 8(20 - 63)$$

$$|X| = -9 + 84 - 344 = -269$$

$|X| \neq 0$, Therefore, Matrix X is a Non-Singular matrix

ii. $|Y| = \begin{vmatrix} 0 & 5 & 0 \\ -3 & -7 & -1 \\ 2 & 1 & 9 \end{vmatrix}$

$$|Y| = 0(171 + 1) - 5(-27 + 2) + 0(-3 + 14)$$

$$|Y| = 0 + 125 - 0 = 125$$

$|Y| \neq 0$, Therefore, Matrix Y is a Non-Singular matrix

iii. RANK OF Y

$$|Y| = \begin{vmatrix} 0 & 5 & 0 \\ -3 & -7 & -1 \\ 2 & 1 & 9 \end{vmatrix}$$

$$|Y| = 0(171 + 1) - 5(-27 + 2) + 0(-3 + 14)$$

$|Y| = 0 + 125 - 0 = 125 \neq 0$; HENCE THE RANK OF Y IS 3

$$\text{iv. } |X+Y| = \begin{vmatrix} 1 & 7 & 8 \\ 1 & 0 & 5 \\ 11 & 6 & 12 \end{vmatrix}$$

$$|X+Y| = 1(0 - 30) - 7(12 - 55) + 8(6 - 0)$$

$$|X+Y| = -30 + 301 + 48 = 319$$

$|X+Y|$ NOT EQUAL TO 0, Therefore, Matrix $X+Y$ is a Non-Singular matrix

$$\text{v. } |5Y| = \begin{vmatrix} 0 & 25 & 0 \\ -15 & -35 & -5 \\ 10 & 5 & 45 \end{vmatrix}$$

$$|5Y| = 0(-1575 + 25) - 25(-675 + 50) + 0(-75 + 350)$$

$$|5Y| = -0 + 15625 - 0 = 15625$$

$|5Y|$ NOT EQUAL TO 0, Therefore, Matrix $5Y$ is a Non-Singular matrix

QUESTION 2

$$T(m) = 1$$

$$T(h) = 1$$

$$T(i) = 3$$

$$T(k) = 5$$

$$T(o) = 9$$

$$T(r) = 9$$

