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MAT 204

COMPUTER SCIENCE

18/SCI01/014

QUESTION 1

A singular matrix is a matrix whose determinant is equal to zero, while a non-singular matrix is a matrix whose determinant is not equal to zero.

QUESTION 2

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

$|X| = 3(20 - 42) − 9(4 - 12) + 2(7 - 10)$

$|X| = -66 + 72 − 6 = -0$

$|X|$ EQUAL TO 0, Therefore, Matrix X is a Singular matrix

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

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

$|Y| = 0 + 125 − 0 = 125$

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

iii. $|C| = \begin{pmatrix} 1 & 7 & 8 \\ 1 & 0 & 5 \\ 11 & 6 & 12 \end{pmatrix}$

|C| = 1(0 - 30) − 7(12 - 55) + 8(6 - 0)

|C| = -30 + 301 + 48 = 319

|C| NOT EQUAL TO 0, Therefore, Matrix **C** is a Non-Singular matrix

iv. $\quad$ |P| = $\begin{pmatrix} 0 & 25 & 0 \\ -15 & -35 & -5 \\ 10 & 5 & 45 \end{pmatrix}$

|P| = 0(-1575 + 25) − 25(-675 + 50) + 0(-75 + 350)

|P| = -0 + 15625 − 0 = 15625

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

v. $\quad$ |A| = $\begin{pmatrix} 1 & 2 & 8 \\ 4 & 7 & 6 \\ 9 & 5 & 3 \end{pmatrix}$

|A| = 1(21 - 30) − 2(12 - 54) + 8(20 - 63)

|A| = -9 + 84 − 344 = - 269

|A| is not equal to zero Therefore, Matrix A is a Non-Singular matrix