**Nwabueze precious akunna**

**18/sci01/055**

**Mat 204**

**QUESTION**

 **1) summarize what you understand by singular and non- singular matrix**

**Solution**

**NON SINGULAR :**

**If the determinant of a matrix is not equal to zero, then the [matrix](basic-of-matrix.html%22%20%5Co%20%22basic%20of%20matrix) is called a non-singular matrix.**

**Properties of non-singular matrix:**

1. **If A and B are non-singular matrices of the same order, then AB is non-singular.**
2. **If A is non-singular, then Ak is non-singular for any positive integer k.**
3. **If A is non-singular and k is a non-zero scalar, then kA is non-singular.**

 **SINGULAR :**

**The [matrices](https://mathinstructor.net/2012/02/starting-with-matrices-order-of-matrix/%22%20%5Co%20%22matrix%22%20%5Ct%20%22_blank) are said to be singular if their [determinant](https://mathinstructor.net/2012/03/determinant-of-matrix/%22%20%5Co%20%22determinant%20of%20matrix%22%20%5Ct%20%22_blank) is equal to zero. For example, if we have matrix A whose all elements in the first column are zero. Then, by one of the [property](https://mathinstructor.net/2012/03/properties-of-determinants/%22%20%5Co%20%22Properties%20of%20Determinants%22%20%5Ct%20%22_blank) of determinants, we can say that its determinant is equal to zero. Hence, A would be called as singular matrix.**

**Note that singular matrices are non-invertible (their inverse does not exist).**

**QUESTION 2**

**Give 5 examples to back your explanations in example 1**

***Example:***

****

***Solution:***

**Determinant = (3 × 2) – (6 × 1) = 0**

**The given matrix does not have an inverse. It is a singular matrix.l**

**The determinant of  i.e. = 6(3) – 5(2) = 18 - 10 = 8 ≠ 0, so it is a non-singular matrix.**

**Example: Determine whether the given matrix is a Singular matrix or not**

**⎡⎣⎢⎢2264086214⎤⎦⎥⎥.**

**Solution: Given ⎡⎣⎢⎢2264086214⎤⎦⎥⎥**

**The Determinant is given by-**

**2(0–16)–4(28–12)+6(16–0)=−2(16)+2(16)=0**

**As the determinant is equal to 0, hence it is a Singular Matrix.**

**is Singular Matrix ?
[111111111]

Solution:**

**A square matrix *A*, such that |*A*|=0, is called a singular matrix.**

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| ***A*** | **=** |

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| --- | --- | --- | --- | --- |
|  | **1** | **1** | **1** |  |
|  | **1** | **1** | **1** |  |
|  | **1** | **1** | **1** |  |

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| **|*A*|** | **=** |

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|  | **1** | **1** | **1** |  |
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|  | **1** | **1** |  |
|  | **1** | **1** |  |

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 **=1×(1×1-1×1)-1×(1×1-1×1)+1×(1×1-1×1)

=1×(1-1)-1×(1-1)+1×(1-1)

=1×(0)-1×(0)+1×(0)

=0+0+0

=0

Here, |*A*|=0, so *A* is a singular matrix**

**2. is Singular Matrix ?
[211121111]

Solution:**

**A square matrix *A*, such that |*A*|=0, is called a singular matrix.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| ***A*** | **=** |

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|  | **2** | **1** | **1** |  |
|  | **1** | **2** | **1** |  |
|  | **1** | **1** | **1** |  |

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| **|*A*|** | **=** |

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|  | **2** | **1** | **1** |  |
|  | **1** | **2** | **1** |  |
|  | **1** | **1** | **1** |  |

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|  | **1** | **1** |  |
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|  | **1** | **2** |  |
|  | **1** | **1** |  |

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 **=2×(2×1-1×1)-1×(1×1-1×1)+1×(1×1-2×1)

=2×(2-1)-1×(1-1)+1×(1-2)

=2×(1)-1×(0)+1×(-1)

=2+0-1

=1

Here, |*A*|≠0, so *A* is nonsingular matrix**

**窗体顶端**

**窗体底端**