Multiple-Choice Test

Chapter 4.01
Introduction

1. For an $n \times n$ upper triangular matrix $[A]$,
   (A) $a_{ij} = 0, i > j$
   (B) $a_{ij} = 0, j > i$
   (C) $a_{ij} \neq 0, i > j$
   (D) $a_{ij} \neq 0, j > i$

2. Which one of these square matrices is strictly diagonally dominant?
   (A) $\begin{bmatrix} 5 & 7 & 0 \\ 3 & -6 & 2 \\ 2 & 2 & 9 \end{bmatrix}$
   (B) $\begin{bmatrix} 7 & -5 & -2 \\ 6 & -13 & -7 \\ 6 & -7 & -13 \end{bmatrix}$
   (C) $\begin{bmatrix} 8 & -5 & -2 \\ 6 & -14 & -7 \\ 6 & -7 & -13 \end{bmatrix}$
   (D) $\begin{bmatrix} 8 & 5 & 2 \\ 6 & 14 & 7 \\ 6 & 7.5 & 14 \end{bmatrix}$

3. The order of the following matrix is
   $\begin{bmatrix} 4 & -6 & -7 & 2 \\ 3 & 2 & -5 & 6 \end{bmatrix}$
   (A) 4×2
   (B) 2×4
   (C) 8×1
   (D) not defined

4. To make the following two matrices equal

$$[A]=\begin{bmatrix}5 & -6 & 7\\ 3 & 2 & 5\end{bmatrix}$$

$$[B]=\begin{bmatrix}5 & p & 7\\ 3 & 2 & 5\end{bmatrix}$$

the value of p is

(A) -6
(B) 6
(C) 0
(D) 7

5. For a square $n\times n$ matrix $[A]$ to be an identity matrix,

(A) $a_{ij}\neq 0, i=j; a_{ij}=0, i=j$
(B) $a_{ij}=0, i\neq j; a_{ij}=1, i=j$
(C) $a_{ij}=0, i\neq j; a_{ij}=i, i=j$
(D) $a_{ij}=0, i\neq j; a_{ij}>0, i=j$

6. To make the following square matrix to be diagonally dominant, the value of p needs to be

$$\begin{bmatrix}6 & -2 & -4\\ 7 & 9 & 1\\ 8 & -5 & p\end{bmatrix}$$

(A) greater than or equal to 13
(B) greater than 3
(C) greater than or equal to 3
(D) greater than 13