Test ID: TESTID Name: _____

MAT 250 **Quiz 2** Spring 2026

Notes:

- the answer *none of these* means that none of the other options have to be true given the definitions and assumptions.
- the zero matrix is a matrix with all entries equal to zero.

1. Let A be an $n \times n$ matrix and suppose that $a_{i,j} = 0$ for $i < j$. Then A must be:
   a) upper triangular b) zero matrix c) symmetric d) lower triangular e) none of these
   Correct Answer: lower triangular

2. Let A be an $n \times n$ matrix and suppose that $a_{i,j} < 0$ for $i = j$. Then A must be:
   a) zero matrix b) symmetric c) lower triangular d) upper triangular e) none of these
   Correct Answer: none of these

3. Let A and B be $n \times n$ matrices and suppose that $C = AB$. Also suppose that the product of row times column $A_{(i)}B^{(j)} = 0$ for all i and j. Then C must be:
   a) zero matrix b) symmetric c) lower triangular d) upper triangular e) none of these
   Correct Answer: zero matrix

4. Let A be an $n \times n$ matrix and suppose that $a_{i,j} > 0$ for $i = j$, and that $a_{i,j} = 0$ for $i < j$. Then it must be true that:
   a) $det(A) = 0$ b) $det(A) < 0$ c) $det(A) > 0$ d) A is symmetric e) none of these
   Correct Answer: $det(A) > 0$

5. Let A be an $n \times n$ matrix and suppose that $a_{i,j} = a_{j,i}$ for all $i \neq j$. Then it must be true that:
   a) $det(A) = 0$ b) $det(A) < 0$ c) $det(A) > 0$ d) A is symmetric e) none of these
   Correct Answer: A is symmetric