Student Name: _____	**Class:** _____
Student ID: _____	**Date:** _____

Assessment Details

Duration: 45 minutes	**Total Marks:** 100
Topics Covered:	• Matrix Components • Types of Matrices • Matrix Operations • Real-World Applications

Instructions to Students:

1. Read all questions carefully before attempting.
2. Show all working out - marks are awarded for method.
3. Calculator use is permitted except where stated otherwise.
4. Write your answers in the spaces provided.
5. If you need more space, use the additional pages at the end.
6. Time management is crucial - allocate approximately 1 minute per mark.

Section A: Multiple Choice [20 marks]

Question 1 **[2 marks]**

What is the order of a matrix with 3 rows and 4 columns?

A) 3 x 4

B) 4 x 3

C) 3 x 3

D) 4 x 4

Question 2 **[2 marks]**

Which of the following is an example of a square matrix?

A) 2 x 3 matrix

B) 3 x 3 matrix

C) 4 x 2 matrix

D) 2 x 2 matrix

Question 3 **[2 marks]**

What is the index of the element in the first row and second column of a matrix?

A) (1, 1)

B) (1, 2)

C) (2, 1)

D) (2, 2)

Question 4 **[2 marks]**

Which type of matrix has all elements equal to zero, except for the main diagonal?

A) Diagonal matrix

B) Identity matrix

C) Square matrix

D) Rectangular matrix

Question 5 **[2 marks]**

What is the purpose of using matrices in real-world applications?

A) To solve systems of linear equations

B) To represent linear transformations

C) To model population growth

D) All of the above

Section B: Short Answer Questions [40 marks]

Question 6 **[8 marks]**

Describe the difference between a square matrix and a rectangular matrix. Provide an example of each.

Question 7 **[8 marks]**

What is a diagonal matrix? Give an example of a diagonal matrix and explain its application in real-world problems.

Question 8 **[8 marks]**

Explain the concept of an identity matrix. How is it used in matrix operations?

Question 9 **[8 marks]**

Describe a real-world scenario where matrices are used to solve a problem. Explain how matrices are used in this scenario.

Question 10 **[8 marks]**

Compare and contrast a 2 x 2 matrix and a 3 x 3 matrix. How do their orders and indices differ?

Section C: Fill-in-the-Blank Questions [20 marks]

Question 11 **[2 marks]**

A matrix with _____ rows and _____ columns is called a _____ matrix.

Question 12 **[2 marks]**

The _____ of a matrix is the number of rows and columns it has.

Question 13 **[2 marks]**

A matrix with all elements equal to zero, except for the main diagonal, is called a _____ matrix.

Question 14 **[2 marks]**

The _____ of an element in a matrix is its position in the matrix, represented by its row and column numbers.

Question 15 **[2 marks]**

Matrices are used to _____ systems of linear equations and _____ linear transformations.

Additional Activities [20 marks]

Activity 1 [10 marks]

Create a 2 x 2 matrix and a 3 x 3 matrix. Label the rows and columns, and identify the index of each element.

Activity 2 [10 marks]

Research a real-world application of matrices and present a short report on how matrices are used in that field.

Assessment Rubric

Multiple Choice Questions: 1 point for each correct answer

Short Answer Questions: 2 points for each correct answer, 1 point for each partially correct answer

Fill-in-the-Blank Questions: 1 point for each correct answer

Additional Activities: 10 points for each activity

Glossary

Matrix: A rectangular array of numbers, symbols, or expressions, arranged in rows and columns.

Index: The position of an element in a matrix, represented by its row and column numbers.

Order: The number of rows and columns in a matrix.

Square matrix: A matrix with the same number of rows and columns.

Diagonal matrix: A matrix with all elements equal to zero, except for the main diagonal.

Identity matrix: A square matrix with all elements equal to zero, except for the main diagonal, which has all elements equal to 1.

References

[Insert references to relevant textbooks or online resources]