



## ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF, SCIENCE, TECHNOLOGY, AGRIC AND FOOD SYSTEMS  
DEVELOPMENT

DEPARTMENT OF DIGITAL TECHNOLOGY AND INFORMATION SYSTEMS

### EXAMINATION PAPER

**COURSE CODE** : DIS 112  
**COURSE TITLE** : Introduction to general Mathematics  
**SPECIAL REQUIREMENTS** : None  
**DURATION** : 3 Hours  
**LEVEL** : 1.1  
**DATE** :

11 JUN 2024

#### INSTRUCTIONS TO CANDIDATES:

1. This paper consists of 2 sections
2. Answer **ALL** Questions in SECTION A and **ANY TWO** Questions from SECTION B in booklet provided.
3. Start each Question on a new page

**There are 5 printed pages on this question paper**

**SECTION A**

Answer ALL questions from this section. The section carries 60 marks

1: Explain the following terms using relevant examples

- (a) Vector
  - (b) magnitude
  - (c) parallel vectors
- [6]

2: Find the lowest common multiple (LCM) of 15,20 and 25. [4]

3: Find the highest common factor (HCF) of each pair of the following numbers

- a) 21 and 49
  - b) 35 and 45
  - c) 18 and 24
- [6]

4: Given  $60 = 2^2 \times 3 \times 5$  and  $84 = 2^2 \times 3 \times 7$

Find

(a) the lowest common multiple(LCM) of 60 and 84. [3]

(b) the highest common factor (HCF) of 60 and 84. [3]

5: Give the order of the following matrices

i)  $\begin{pmatrix} 2 & 4 & 5 \end{pmatrix}$

ii)

$$\begin{bmatrix} 1 & 0 \\ 3 & -4 \\ 2 & -1 \end{bmatrix}$$

iii)

$$\begin{bmatrix} 2 & 5 & 2 \\ -3 & 9 & 7 \end{bmatrix}$$

[6]

6: Explain the following terms using relevant examples

- (a) Element
- (b) Set
- (c) Union
- (d) intersection
- (e) Complement of a Set

[10]

7: If

$$A = \begin{bmatrix} 1 & 3 \\ -2 & 8 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} -4 & 6 \\ 0 & 7 \end{bmatrix}$$

Find

- i A+B
- ii A\*B
- iii 3A
- iv 4(A+B)
- v A-B
- vi 2A+3B
- vii The determinant of matrix A
- viii The inverse of matrix A

[16]

8: Find the lowest common multiple (LCM) of each pair of numbers.

- a) 11 and 24
- b) 14 and 22
- c) 15 and 21

[6]

## SECTION B

Choose any *TWO* questions from this section. Each question carries *20 marks*.

9

- a) A rectangle piece of land measures 486 m by 360m. It is marked off exactly into equal square stands. Find the greatest area of a stand in  $m^2$  [10]
- b) A certain mass of salt can be divided into equal heaps. Each heap contains either 27g, 45g, 30g or 20g. Find the smallest mass of salt for which this is possible. [10]

10:

- a) Given the following matrices where

$$A = \begin{pmatrix} 3 \\ 2 \end{pmatrix}, \quad B = \begin{pmatrix} 2 & 1 \\ 0 & 1 \end{pmatrix},$$
$$C = (1; 2; 8), \quad D = \begin{pmatrix} 6 & 8 \\ 2 & 14 \end{pmatrix}$$

Find

- i  $3A$
- ii  $4B$
- iii  $-2C$
- iv  $2D$
- v  $D-3B$
- vi  $AB$
- vii  $B+D$

[14]

- b) If

$$A = \begin{pmatrix} 3 & 2 \\ 1 & 4 \end{pmatrix} \text{ and } B = \begin{pmatrix} 2 & -1 \\ 0 & 3 \end{pmatrix}$$

Show that  $AB$  is not equal to  $BA$

[6]

11.

a) If

$$\mathbf{p} = \begin{pmatrix} 3 \\ 5 \end{pmatrix}, \mathbf{q} = \begin{pmatrix} -4 \\ 3 \end{pmatrix}, \mathbf{r} = \begin{pmatrix} 1 \\ -2 \end{pmatrix}$$

Find

- i  $p+q$
- ii  $p+r$
- iii  $q+r$
- iv  $p=q+r$
- v  $|q|$

[11]

b) If

$$\mathbf{p} = \begin{pmatrix} 7 \\ -3 \end{pmatrix} \text{ and } \mathbf{q} = \begin{pmatrix} -6 \\ 2 \end{pmatrix}$$

Find

- i  $p-q$
- ii  $p+q$
- iii  $q-p$
- iv  $|p+q|$
- v  $|p-q|$

[9]

\*\*\* All the best \*\*\*

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