

## 7.1.0 MATHEMATICS I

### 7.1.01 Introduction

The module unit is designed to equip the trainee with the relevant mathematical knowledge, skills, techniques and attitudes necessary to enhance better understanding of his/her trade.

### 7.1.02 General Objectives

By the end of the module unit, the trainee should be able to:

- a) use mathematical concepts and techniques in solving problems related to electrical and electronic engineering
- b) organize and draw simple deductions and conclusions from a given data.
- c) interpret graphical representation of functions relevant to electrical activities.

### 7.1.03. Module Unit Summary and Time Allocation

#### Mathematics I

Code	Sub-Module Unit	Content	Time Hrs
7.1.1	Number System	<ul style="list-style-type: none"> <li>• Types of numbers</li> <li>• Operation on integers</li> <li>• Number as products of prime factors</li> <li>• Greatest Common Divider/Highest Common Factor (GCD/HCF ) of a set of numbers</li> <li>• Lowest Common Divider (LCM of a set of numbers</li> <li>• Application of GCD and LCM</li> </ul>	4
7.1.2	Fractions and Decimals	<ul style="list-style-type: none"> <li>• Types of fractions</li> <li>• Operation on fractions</li> <li>• Application of fractions</li> <li>• Operation on decimals</li> <li>• Numbers in standard form</li> <li>• Rounding off numbers</li> </ul>	4

		<ul style="list-style-type: none"> <li>• Fractions to decimals</li> <li>• Application of fractions and decimals</li> </ul>	
7.1.3.	Indices and Logarithms	<ul style="list-style-type: none"> <li>• Laws of indices</li> <li>• Indicial equations</li> <li>• Laws of logarithms</li> <li>• Logarithmic equations</li> <li>• Conversion of numbers from one base to another</li> <li>• Scientific calculator</li> </ul>	8
7.1.4	Matrices	<ul style="list-style-type: none"> <li>• Definition of a matrix</li> <li>• Operation on matrices</li> <li>• Inverse of a 2 x 2 matrix</li> <li>• Solution of simultaneous equations by matrix method</li> </ul>	10
7.1.5	Sequence and Series	Sequence and series Solution on problems involving series Simple and compound interest	8
7.1.6	Statistics	Definition Data collection Data organization Frequency distribution table Data presentation Central tendency Data interpretation Variance and Standard deviation Data computation	10
<b>Total</b>			<b>44</b>

**7.1.1 NUMBER SYSTEM**

7.1.1T0 *Specific Objectives*  
 By the end of the sub-module unit, the trainee should be able to:

- a) identify the various types of numbers
- b) carry out arithmetic operation on integers
- c) express numbers as products of prime factors
- d) find the G.C.D/H.C.F of a set of numbers
- e) find the L.C.M. of a set of numbers
- f) apply the knowledge of G.C.D and L.C.M in real life situations.

*Content*

7.1.1T1 Types of numbers  
 7.1.1T2 Operation on integers  
 7.1.1T3. Numbers as product of  
 - Prime factors  
 7.1.1T4 G.C.D/H.C.F of a set of numbers  
 7.1.1T5 L.C.M of a set of numbers  
 7.1.1T6 Application of G.C.D and L.C.M to real life situations

**7.1.2 FRACTIONS AND DECIMALS**

7.1.2T0 *Specific Objectives*  
 By the end of the sub-module unit, the trainee should be able to:

- a) identify various types of fractions
- b) perform the four operations on fractions in the correct order
- c) apply fractions to real life situations
- d) perform the four basic operations on decimals in the correct order
- e) express numbers in their standard form
- f) round off numbers to the required number of decimal places
- g) convert fractions to decimals and vice versa
- h) apply the knowledge of decimals and fractions to real life situations.

*Content*

7.1.2T1 Types of fractions  
 7.1.2T2 Operation on fractions  
 7.1.2T3. Application of fractions to real life situations  
 7.1.2T4 Operation on decimals  
 7.1.2T5 Numbers in standard form  
 7.1.2T6 Rounding off numbers to the required number of decimal places

- 7.1.2T7 Conversion of fractions to decimals and vice versa
- 7.1.2T8 Application of fractions and decimals

**7.1.3 INDICES AND LOGARITHMS**

- 7.1.3T0 *Specific Objectives*  
By the end of this unit, the trainee should be able to:
- a) state the laws of indices
  - b) apply the laws of indices in calculations
  - c) state the laws of logarithms
  - d) apply the laws of logarithms in calculations
  - e) convert numbers from one base to another
  - f) use a scientific calculator.

*Content*

- 7.1.3T1 Laws of indices
- i) Multiplication
  - ii) Division
  - iii) The root
  - iv) The negative indices
- 7.1.3T2 Indicial equations
- 7.1.3T3. Laws of logarithms
- i) Multiplication
  - ii) Division
  - iii) Powers
  - iv) Roots
- 7.1.3T4 Logarithmic equations

- 7.1.3T5 Conversion of numbers from one base to another
- i) Decimal/denary
  - ii) Duodecimal
  - iii) Binary
- 7.1.3T6 Scientific calculator usage

**7.1.4 MATRICES**

- 7.1.4T0 *Specific Objectives*  
By the end of the sub-module unit, the trainee should be able to:
- a) define a matrix
  - b) carry out operations on matrices
  - c) determine the inverse of a 2x2 matrix
  - d) apply matrices in solving simultaneous equations.

*Content*

- 7.1.4T1 Matrix
- 7.1.4T2 Operation on matrices
- 7.1.4T3. Inverse of a 2x2 matrix
- 7.1.4T4 Solution of simultaneous equations by matrices

**7.1.5 SEQUENCE AND SERIES**

- 7.1.5T0 *Specific Objectives*  
By the end of the sub-module unit, the

- trainee should be able to:
- a) distinguish between a sequence and a series
  - b) solve problems involving series
  - c) apply the knowledge of series in calculating simple and compound interest.

*Content*

- 7.1.5T1 Sequence and series
- 7.1.5T2 Solution of problems involving series
  - i) Arithmetic progression
  - ii) Geometric progression
- 7.1.5T3 Simple and compound interest

**7.1.6 STATISTICS**

- 7.1.6T0 *Specific Objectives*  
By the end of the sub-module unit, the trainee should be able to:
  - a) define statistics
  - b) collect data
  - c) organize data
  - d) draw a frequency distribution table
  - e) present data
  - f) calculate measures of central tendency
  - g) interpret data from real life situations

- h) determine the variance and standard deviation of given a set of data
- i) compute the quartiles, percentiles and deciles of a given set of data.

*Content*

- 7.1.6T1 Definition of statistics
- 7.1.6T2 Data collection
  - i) Process of data collection
  - ii) Data collection in the field
- 7.1.6T3. Data organization
  - i) Types of data
  - ii) Data tabulation
- 7.1.6T4 Frequency distribution tables
- 7.1. 6T5 Data presentation
  - i) Line graphs
  - ii) Bar graphs
  - iii) Pie charts
  - iv) Pictograms
  - v) Histograms
  - vi) Frequency polygons
- 7.1.6T6 Measures of central tendency
  - i) Mode
  - ii) Median
  - iii) Mean
- 7.1.6T7 Data interpretation
- 7.1.6T8 Variance and standard deviation
- 7.1.6T9 Quartiles, percentiles and deciles