

## 6.1.0 MATHEMATICS I

### 6.1.01 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.

### 6.1.02 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 Automotive Technology
- b) Organize and draw simple deductions and conclusions from a given data.
- c) Interpret graphical representation of functions relevant to Automotive activities

### 6.1.03. MODULE UNIT SUMMARY AND TIME ALLOCATION

#### MATHEMATICS I

Code	Sub-Module Unit	Content	Time Hrs
6.1.1	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>• LCM of a set of numbers</li><li>• Application of GCD and LCM</li></ul>	4
6.1.2	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></ul>	4

		<ul style="list-style-type: none"> <li>• Numbers in standard form</li> <li>• Rounding off numbers</li> <li>• Fractions to decimals</li> <li>• Application of fractions and decimals</li> </ul>	
6.1.3.	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
6.1.4	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
6.1.5	Sequence series	<ul style="list-style-type: none"> <li>• Sequence and series</li> <li>• Solution on problems involving series</li> <li>• Simple and compound interest</li> </ul>	8
6.1.6	Statistics	<ul style="list-style-type: none"> <li>• Definition</li> <li>• Data collection</li> <li>• Data organization</li> <li>• Frequency distribution table</li> <li>• Data presentation</li> <li>• Measures of central tendency</li> <li>• Data interpretation</li> <li>• Variance and standard deviation</li> <li>• Data computation</li> </ul>	10
Total Time			<b>44</b>

6.1.1 **NUMBER SYSTEM**

6.1.1T0 *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

6.1.1C *Competence*  
The trainee should have the ability to apply the knowledge of G.C.D and L.C.M in real life situations

*Content*

- 6.1.1T1 Types of numbers
- 6.1.1T2 Operation on integers
- 6.1.1T3. Numbers as product of prime factors
- 6.1.1T4 G.C.D/H.C.F of a set of

numbers

6.1.1T5 L.C.M of a set of numbers

6.1.1T6 Application of G.C.D and L.C.M to real life situations

6.1.2 **FRACTIONS AND DECIMALS**

6.1.2T0 *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

<p>6.1.2C    <b>Competence</b> The trainee should have the ability to apply the knowledge of fractions and decimals to real life situations</p> <p style="text-align: center;"><i>Content</i></p> <p>6.1.2T1 Types of fractions 6.1.2T2 Operation on fractions 6.1.2T3. Application of fractions to real life situations 6.1.2T4 Operation on decimals 6.1.2T5 Numbers in standard form 6.1.2T6 Rounding off numbers to the required number of decimal places 6.1.2T7 Conversion of fractions to decimals and vice versa 6.1.2T8 Application of fractions and decimals</p> <p>6.1.3    <b>INDICES AND LOGARITHMS</b></p> <p>6.1.3T0 <i>Specific Objectives</i> 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</p>	<p>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</p> <p>6.1.3C    <b>Competence</b> The trainee should have the ability to use a scientific calculator in solving problem of indices and logarithms</p> <p style="text-align: center;"><i>Content</i></p> <p>6.1.3T1 Laws of indices Multiplication Division The root The negative indices 6.1.3T2 Indicial equations 6.1.3T3. Laws of logarithms Multiplication Division Powers Roots 6.1.3T4 Logarithmic equations 6.1.3T5 Conversion of numbers from one base to another Decimal/denary duodecimal binary 6.1.3T6 Scientific calculator</p>
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6.1.4 **MATRICES**

Practice

- 6.1.4T0 *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

- 6.1.4C *Competence*  
The trainee should have the ability to apply the knowledge of matrices in solving simultaneous equations

*Content*

- 6.1.4T1 Matrix
- 6.1.4T2 Operation on matrices
- 6.1.4T3. Inverse of a 2x2 matrix
- 6.1.4T4 Solution of simultaneous equations by matrices

6.1.5 **SEQUENCE AND SERIES**

Theory

- 6.1.5T0 *Specific Objectives*  
By the end of the sub-module unit, the trainee should be able to:
- i. distinguish between a sequence and a series
  - ii. solve problems involving series
  - iii. apply the knowledge of series in calculating simple and compound interest

- 6.1.5C *Competence*  
The trainee should have the ability to apply the knowledge of series in calculating simple and compound interest

*Content*

- 6.1.5T1 Sequence and series
- 6.1.5T2 Solution of problems involving series  
Arithmetic progression  
Geometric progression
- 6.1.5T3. Simple and compound interest

6.1.6	<b>STATISTICS</b>		Data tabulation
6.1.6T0	<i>Specific Objectives</i> By the end of the sub-module unit, the trainee should be able to:	6.1.6T4	Frequency distribution tables
	a) define statistics	6.1.6T5	Data presentation
	b) collect data		Line graphs
	c) organize data		Bar graphs
	d) draw a frequency distribution table		Pie charts
	e) present data		Pictograms
	f) calculate measures of central tendency	6.1.6T6	Histograms
	g) interpret data from real life situations		Frequency polygons
	h) determine the variance and standard deviation of given a set of data	6.1.6T6	Measures of central tendency
	i) compute the quartiles, percentiles and deciles of a given set of data		Mode
6.1.5C	<i>Competence</i> The trainee should have the ability to apply the knowledge statistics in engineering	6.1.6T7	Median
		6.1.6T8	Mean
		6.1.6T7	Data interpretation
		6.1.6T8	Variance and standard deviation
		6.1.6T9	Quartiles, percentiles and deciles
	<i>Content</i>		
6.1.6T1	Definition of statistics		
6.1.6T2	Data collection Process of data collection Data collection in the field		
6.1.6T3.	Data organization Types of data		