INDUSTRIAL ELECTRONICS N1:

TEST 1
Module 1: Electric current principles
Module 2: Direct current and resistance
Module 4: Cells and batteries

TEST 2
Module 2: Direct current and resistance
Module 3: Measuring instruments
Module 5: Alternating current principles
Module 6: Principles of magnetism
Module 7: Inductors and transformers
Module 8: Principles of capacitors
Module 9: Semiconductor principles

INDUSTRIAL ELECTRONICS N3:

TEST 1
Module 1: Atomic theory
Module 2: Direct current theory
Module 3: Alternating current theory

TEST 2
Module 2: Direct current theory
Module 4: Semiconductor diodes
Module 5: The transistor
Module 6: Measuring instruments
Module 7: Transducers
Module 8: Operational amplifiers
Module 9: Electronic power control

INDUSTRIAL ELECTRONICS N6:

TEST 1
Module 1: Transients
Module 2: Transducers
Module 3: Ultrasonics

TEST 2
Module 4: X-rays and radio activity
Module 5: Automatic inspection, testing and NDT
Module 6: Electronic safety devices
Module 7: Electronic power control
Module 8: Thyristor devices and scr speed control
Module 9: Programmable logic controllers

MECHANOTECHNICS N4

TEST 1
1. Organization and layout of a Workshop
2. Belt drives
3. Belt conveyors
4.Metal cutting machines

TEST 2
1. Metal protection
2. Precision measuring of machine parts
3. Bearings
4. Gear drives
5.Hydraulics 1
6. Hydraulics 2

ENGINEERING SCIENCE N4

TEST 1
Mod 1 - Kinematics
Mod 2 – Angular motion
Mod 3 – Dynamics

TEST 2
Mod 1 - Kinematics
Mod 2 – Angular motion
Mod 3 – Dynamics
Mod 4 - Statics
Mod 5 – Hydraulics
Mod 6 – Stress strain and Youngs modulus

POWER MACHINES N6

TEST 1
Mod 1 – Revision gas laws N5
Mod 2 – Internal combustion engines
Mod 3 – Cycles

TEST 2
Mod 1 – Revision gas laws N5
Mod 2 – Internal combustion engines
Mod 3 – Cycles
Mod 4 – Compressors
Mod 5 – Nozzles
Mod 6 – Steam plants

MATHEMATICS N1

TEST 1
Mod 1 – Exponents and Logarithms
Mod 2 – Four main algebraic operations
Mod 4 – Equations

TEST 2
Mod 1 – Exponents and Logarithms
Mod 2 – Four main algebraic operations
Mod 3 – Factorization and Fractions
Mod 4 – Equations
Mod 5 – Algebraic Fractions ‘
Mod 6 – Triangles
Mod 7 – Trigonometry

MATHEMATICS N2

TEST 1
Mod 1 – Exponents and Logarithms
Mod 3 - Equations

TEST 2
Mod 1 – Exponents and Logarithms
Mod 2 – Factorization and Fractions
Mod 3 – Equations
Mod 4 – Algebraic Graphs
Mod 6 – Trigonometry

MATHEMATICS N3

TEST 1
Mod 1 – Factorization and Fractions
Mod 2 – Exponents, Surds and Logarithms

TEST 2
Mod 3 – Equations
Mod 4 – Coordinate Geometry
Mod 5 – Algebraic Graphs
Mod 6 – Differential Calculus
Mod 7 – Trigonometry

ELECTROTECHNOLOGY N3:

TEST 1
Chapter 1: DC machines
Chapter 2: Generator and motor principles
Chapter 3: Direct current generators
Chapter 4: Direct current motor

INDUSTRIAL ELECTRONICS N2

TEST 1
Chapter 1: DC theory
Chapter 2: AC theory
Chapter 3: Measuring instruments

TEST 1 TOPICS

MOTOR TRADE THEORY N1

- Workshop safety
- Measuring instruments
- Engine components

MOTOR AND DIESEL N2

- Gearbox.
- Driveshaft and couplings.
- Differential.

STRENGTH OF MATERIALS AND STRUCTURES N5

- Stress and strain and testing of materials
- Strain energy
- Compound bars and temperature induced stress.

STRENGTH OF MATERIALS AND STRUCTURES N6

- A-frames, tripods and the Derrick crane.
- Thick cylinders
- Defection of beams.

TEST 2 TOPICS

MOTOR TRADE THEORY N1

- Workshop safety
- Measuring instruments
- Engine components
- Engine operation
- Engine Lubrication
- Engine layouts
- Engine cooling systems
- Operation of the clutch (drive train)

MOTOR AND DIESEL N2

- Gearbox.
- Driveshaft and couplings.
- Differential.
- Brakes.
- Wheel alignment.
- Steering boxes.
- Fuel systems.

STRENGTH OF MATERIALS AND STRUCTURES N5

- Stress and strain and testing of materials.
- Strain energy.
- Compound bars and temperature induced stress.
- This cylinders and riveted joints.
- Loading of beams.
- Simple bending of beams.
- Columns and struts.
- Shafts.

STRENGTH OF MATERIALS AND STRUCTURES N6

- A-frames, tripods and the Derrick crane.
- Thick cylinders
- Defection of beams.
- Combined, direct and bending stress.
- Retaining walls.
- Concrete.
- Tension in cables

N3 Engineering Science

Test 1

- Motion energy and power
- Moments
- Forces.

N4 Industrial Electronics

Test 1

- Kirchhoff's Laws
- Series and Parallel RLC networks
- Atomic theory, PN junction and Semiconductors
  Thevenin's theorem

N5 Industrial Electronics

Test 1

- Behaviour of an alternating quantity on RC,RL, RLC circuits
- Power supplies

N5 Mathematics

Test 1

- Limits and continuity
- Differentiation

N4 Mathematics

Test 1

- Equations, Manipulations and word problems
- Complex numbers
- Determinants
- Sketching of graphs

Compulsory Test Scope:

Engineering Drawing N1

Compulsory Test 1

07 October 2020

Module 1 Fundamentals of Engineering Drawing

Module 2 Computer Aided Draughting, Drawing Terminology and Abbreviations.

Module 3 Freehand Drawings

Module 4 Geometrical Constructions

Compulsory Test 2

28 October 2020

Module 6 First-Angle Orthographic Projection

Module 7 Axonometric Drawings

Module 8 Geometrical Solids: The projection of prisms and Pyramids.

Module 9 Sectional Drawings.

Compulsory Test Scope:

Engineering Drawing N2

Compulsory Test 1

07 October 2020

Module 1 Fundamentals of Engineering Drawing

Module 2 DrawTerminology, Abbreviations and Computer Aided Draughting

Module 3 Fastening and Welding Devives

Module 4 Screw Threads

Compulsory Test 2

28 October 2020

Module 6 First-Angle Orthographic Projection

Module 7 Isometric Drawings

Module 8 Curves of Penetration

Module 9 Third-Angle Ortographic Projection

Note: A question on **Module 6** (First-Angle Orthographic Projection) or **Module 9** (Third-Angle Othographic Projrction) will be ask during the test.

Compulsory Test Scope:

Engineering Drawing N3

Compulsory Test 1

07 October 2020

Text Book: Engineering Drawing N4 - Authors: - CL Moolman and CG Brink.

Module 1 Fundamentals of Engineering Drawing

Module 2 Geometrical Constructions

Module 3 Orthographic Projection

Module 4 Isometric Projections and Perspective Drawing

Text Book: Engineering Drawing N3-Author : - Kristy Cochius

Module 1 Drawing Equipment and Drawing Fundamental

Module 2 Line Types and Printing

Module 3 Freehand Drawing

Module 4 Geometrical Construction

Module 5 Dimesion Conventions

Module 6 Orthographic Projections.

Module 7 Isometric Projection

Module 8 Perspective Drawings

28 October 2020

Module 11	Sectional Drawings of Assemblies - The following Modules may be included to be presented on the drawings: Module 3; Module 5; Module Module 6; Module 7 and Module 10.	**Module 11**	Sectional Drawings.
Module 12	Assembly Drawings. - The following Modules may be included to be presented on the drawings: Module 3; Module 5; Module Module 6; Module 7 and Module 10.	**Module 12**	Assembly Drawings.

Compulsory Test Scope:

Fitting and Machining Theory N1

Compulsory Test 1

10 October 2020

Module 1 Occupational Safety

Module 2 Metals and Plastics

Module 3 Hand Tools

Module 4 Measuring Instruments

Compulsory Test 2

31 October 2020

Module 5 Marking Off

Module 6 Screw Thread

Module 10 Grinding Machines

Module 11 Shaping Machines

Module 13 Machine Cutting Tools

Module 14 The Centre Lathe

Compulsory Test Scope:

Fitting and Machining Theory N2

Compulsory Test 1

10 October 2020

Module 1 Occupational Health & Safety (Act No. 85 of 1993)

Module 2 Couplings

Module 3 Limits and Fits

Module 4 Bearings

Compulsory Test 2

31 October 2020

Module 5 Marking Off

Module 6 Screw Thread

Module 10 Grinding Machines

Module 11 Shaping Machines

Module 13 Machine Cutting Tools

Module 14 The Centre Lathe

Modules included in the assessments by J.Moyo

Electrotechnics N4

Test one : Current flow in an electrical circuit

Magnetism and electricity

Electromagnetism and induction

Capacitors

Test two : DC current machines

AC current theory

AC machines

Transmission

Measuring instruments

Electrotechnics N5

Test one : DC machines

AC circuit theory

Test two: Transformers

Measuring instruments

AC machines

AC generation and supply

Power machines N5

Test one: Gases

Entropy of gases

Compressors

Combustion of fuel

Test two : Steam power plants

Steam generation

Boiler calculations

Condensers

Steam turbines

Governors

Control systems N6

Test one: Laplace transforms

Initial and final value theorem

2nd order systems

Block diagram algebra

Test two: Bode diagrams

Nichol's chats

Root locus

Transducers

Electronic circuits

Electrical and machines and systems

Control systems N6

Test one: Laplace transforms

Initial and final value theorem

2nd order systems

Block diagram algebra

Test two: Bode diagrams

Nichol's chats

Root locus

Transducers

Electronic circuits

Electrical and machines and systems

SUBJECTS	TEST 1	TEST 2
ELECTRICAL TRADE THEORY N1	1. SAFETY & BASIC HAND TOOLS 2. ELCTRICAL CIRCUITS 3. MAGNETISM & TRANSFORMERS	1. ALTERNATING CURRENT 2. BATTERIES & DC SOURCES 3. MEASURING INSTRUMENTS 4. CONDUCTORS CABLES & WIRE WAYS 5. WIRING PREMISES 6. TESTING
MECHANOTECHNICS N5	1. EPICYCLIC GEARS AND GEAR TRAINS 2. REDUCTION GEARBOXES 3. BELT DRIVES	1. BUCKET ELEVATORS AND BUCKET CONVEYORS 2. ROPE HAULAGES 3. ELEVATORS 4. RAIL AND ROAD TRACTION CALCULATIONS 5. FLYWHEELS
MECHANOTECHNICS N6	1. FRICTION CLUTCHES 2. BRAKES 3. TRANSMISSION SHAFTS	1. FLYWHEELS 2. REDUCTION GEARBOXES 3. DYNAMICS 4. BALANCING
ELECTROTECHNICS N6	1. DC MACHINES 2. AC CIRCUITS	1. TRANSFORMERS 2. AC MACHINES – SYNCHRONOUS 3. AC MACHINES – INDUCTION MOTORS 4. GENERATION & AC SUPPLY 5. MEASURING INSTRUMENTS

Compulsory Test Scope:

Machanotecnology N3.

Compulsory Test 1

10 October 2020

Module 1 Power Transmission

Module 2 Brakes

Module 3 Brearings

Compulsory Test 2

31 October 2020

Module 4 Water Pumps, Cooling and Lubrication

Module 5 Hydraulics and Pneumatics

Module 6 Internal Combbustion Engines

Module 7 Cranes and Lifting Machines

Module 8 Material and Material Processes

Module 9 Industrial Oganisation and Planning

Module 10 Entreneurship

Power machines N5

Test one: Gases

Entropy of gases

Compressors

Combustion of fuel

Test two : Steam power plants

Steam generation

Boiler calculations

Condensers

Steam turbines

Governors