Section II

Question 16 (a)

Sample answer:
Fuse

Question 16 (b)

Sample answer:
Variable Resistor, Rheostat, Potentiometer, POT

Question 16 (c)

Sample answer:
Double Insulated
Question 17 (a)

Sample answer/Answers could include:

\[ V = IR \quad E = IR \]

\[ I = \frac{V}{R} \quad I = \frac{E}{R} \]

\[ R = \frac{V}{I} \quad R = \frac{E}{I} \]

Question 17 (b)

Sample answer/Answers could include:

\[ I = \frac{V}{R} \]

\[ = \frac{25}{10} = 2.5 \text{ A} \]

Question 18 (a)

Sample answer/Answers could include:

Band 1 Blue
Band 2 Grey
Band 3 Brown
Band 4 Brown

Question 18 (b)

Sample answer:

20 M\(\Omega\) 5%
Tolerance Value 1 M\(\Omega\)
21 M\(\Omega\)
Question 19 (a) (i)

Sample answer:

A Battery

Question 19 (a) (ii)

Sample answer/Answers could include:

B Lamp, Indication light-reference to light or lamp (NOT LED)

Question 19 (b)

Sample answer/Answers could include:

• Current flows
• Light on

Question 19 (c)

Sample answer/Answers could include:

• Short circuit
• Fuse blown
• Light out
Question 20 (a)

Sample answer/Answers could include:

\[ T = RC \]
\[ = 15k \times 47 \text{ } \mu\text{F} \]
\[ = .705 \text{ sec or } 705 \text{ mSec} \]

Question 20 (b)

Sample answer/Answers could include:

\[ I = \frac{V}{R} \]
\[ = \frac{100}{15k} = 6.67 \text{ mA} \]

Question 20 (c)

Sample answer/Answers could include:

\[ R = \frac{T}{C} \]
\[ = \frac{1}{47 \times 10^{-6}} \]
\[ = 21.276 \text{ K} \]
\[ 21.276 \text{ K} - \]
\[ \frac{15 \text{ } k}{6276 \text{ } \Omega} \]
Question 21 (a)

*Sample answer/Answers could include:*

- Pop rivet pliers, pop rivet gun, pop rivet tool → fixing pop rivets

Question 21 (b)

*Sample answer/Answers could include:*

- Combination pliers, electricians pliers → holding, cutting wire, gripping, twisting and stripping wire

Question 22 (a)

*Sample answer/Answers could include:*

- Moving a conductor through a magnetic field
- Moving a magnetic field along a conductor

Question 22 (b)

*Answers could include:*

- Geothermal
- Wind
- Tidal
- Hydro

*Answers must NOT include:*

- Solar
- Coal/Fossil fuels
- Nuclear
Question 23

Answers should include:
- Correct KΩ range
- Zero adjustment after range selection
- Check meter operational (0Ω, ∞Ω)
- Recognition of parallax error

Question 24

Sample answer/Answers could include:
\[
R_2 + R_3 = 12 + 52 = 64 \, \Omega \\
R_4 + R_5 = 40 + 33 = 73 \, \Omega \quad \text{Series}
\]
\[
R_p = \frac{R_{23} \times R_{45}}{R_{23} + R_{45}} = \frac{64 \times 73}{64 + 73} = 34.1 \, \Omega \quad \text{Parallel}
\]
\[
R_p = \frac{1}{\frac{1}{64} + \frac{1}{73}} = 34.1 \, \Omega
\]
\[
R_T = R_1 + R_p + R_6 \\
= 24 + 34.1 + 27 \quad \text{Series}
\]
\[
= 85.1 \, \Omega
\]
Section III

Question 25

Sample answer/Answers could include:

- List of equipment required
  - Voltmeter (testing tool)
  - Hand tools
  - PPE

- List of procedure
  - Assess the need to isolate the equipment and your ability to safely perform the isolation
  - Notify all people affected by the work OR get authority to isolate the circuit
  - Determine the best method of isolating the supply
  - Test testing tools on known active supply
  - Test for presence of supply
  - Safely isolate supply
  - Place danger tag in the isolation switch AND lock switch off
  - Test the supply is isolated from equipment
  - Test equipment on known active supply
  - Physically isolate equipment
  - Make safe disconnected cable
Question 26

Sample answer/Answers could include:

- List of tools required including:
  - Rule
  - Scribe
  - Punch
  - Hammer
  - Drilling machine
  - 8.5 mm / 9.0 mm drill BIT
  - Tap handle
  - M10 \times 1.5 taper / inter / plug tap
  - Thread cutting lubricant
  - Vice
  - Square
  - PPE

- List of procedure for process including:
  - Mark out material (rule and scribe – punch and hammer)
  - Drill hole 8.5 / 9.0 mm \( \Phi >15 <50 \) deep (PPE)
  - Remove swarf
  - Vice material
  - Lube taper tap, begin tapping operation, using square to ensure thread squareness
  - Remove swarf
  - Repeat process for inter and plug tap
Question 27

Sample answer/Answers could include:

- Actions and tasks to be undertaken:
  - Pacify customer
  - Listen to customers concerns, noting areas relevant to fault and its cause
  - Provide appropriate, accurate reassuring responses
  - Identify systems of problem
  - Keep customer updated with progress of fault diagnosis and ratification
  - Follow relevant appropriate OHS practices
  - Isolation procedures
  - Safe working area
  - Progressively test equipment and wiring in affected areas
  - Record and report findings to supervisor and customer
  - Either obtain clearance to repair immediately OR obtain date for the repairs to be made from supervisor
  - Relay this information to customer