Unit 13: Voltage, Current and Resistance

Short-answer questions

Instructions to students

• In this unit, you will be able to practise and improve your skills in calculating voltage, current and resistance.
• Read the following questions and answer all of them in the spaces provided.
• No calculators.
• You will need to show all working.

Ohm’s law: $V = I \times R$
where:
$V$ = voltage, with volts (V) as the unit of measurement
$I$ = current, with amperes (A) as the unit of measurement
$R$ = resistance, with ohms (Ω) as the unit of measurement

Transposing this formula gives the following variations:

$\frac{V}{I}$

$\frac{R}{V}$

**QUESTION 1**
What is the voltage ($V$) of a small appliance if the current ($I$) is 12 A and the resistance ($R$) is 10 Ω?

**Answer:**
120 V

**QUESTION 2**
What is the resistance ($R$) if the current ($I$) is 15 A and the voltage ($V$) is 230 V?

**Answer:**
15.33 Ω

**QUESTION 3**
Find the current ($I$) if the voltage ($V$) is 230 V and the resistance ($R$) is 20 Ω.

**Answer:**
11.5 A

**QUESTION 4**
Find the voltage ($V$) if the resistance ($R$) is 25 Ω and the current ($I$) is 5 A.

**Answer:**
125 V

**QUESTION 5**
What is the resistance ($R$) if the current ($I$) is 25 A and the voltage ($V$) is 230 V?

**Answer:**
9.2 Ω

**QUESTION 6**
Find the current ($I$) if the voltage ($V$) is 230 V and the resistance ($R$) is 50 Ω.

**Answer:**
4.6 A
QUESTION 7
Find the voltage \((V)\) if the resistance \((R)\) is 35 \(\Omega\) and the current \((I)\) is 4 A.

Answer:
140 V

QUESTION 8
What is the resistance \((R)\) if the current \((I)\) is 15 A and the voltage \((V)\) is 24 V?

Answer:
1.6 \(\Omega\)

QUESTION 9
Find the current \((I)\) if the voltage \((V)\) is 12 V and the resistance \((R)\) is 0.5 \(\Omega\).

Answer:
24 A

QUESTION 10
Find the voltage \((V)\) if the resistance \((R)\) is 1.5 \(\Omega\) and the current \((I)\) is 3 A.

Answer:
4.5 V

QUESTION 11
Find the total resistance \((R_t)\) if resistor 1 \((R_1)\) equals 130 \(\Omega\), resistor 2 \((R_2)\) equals 100 \(\Omega\) and resistor 3 \((R_3)\) equals 180 \(\Omega\).

Answer:
410 \(\Omega\)

QUESTION 12
Find the total resistance \((R_t)\) if \(R_1\) equals 60 \(\Omega\), \(R_2\) equals 110 \(\Omega\) and \(R_3\) equals 100 \(\Omega\).

Answer:
270 \(\Omega\)

QUESTION 13
Find the total resistance \((R_t)\) if \(R_1\) equals 0.03 \(\Omega\), \(R_2\) equals 1.70 \(\Omega\) and \(R_3\) equals 11.0 \(\Omega\).

Answer:
12.73 \(\Omega\)

QUESTION 14
Find the total resistance \((R_t)\) if \(R_1\) equals 4.25 \(\Omega\), \(R_2\) equals 7.5 \(\Omega\) and \(R_3\) equals 13.7 \(\Omega\).

Answer:
25.45 \(\Omega\)

QUESTION 15
Find the total resistance \((R_t)\) if \(R_1\) equals 0.5 \(\Omega\), \(R_2\) equals 2.5 \(\Omega\) and \(R_3\) equals 3.5 \(\Omega\).

Answer:
6.5 \(\Omega\)