Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

(a) $P = V \times I$ **1**

(b) $4.4 = 40 \times I$ **1**

$I = \frac{4.4}{40}$ **1**

$I = 0.11$ (A) **1**

(c) $\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$ **1**

(d) $0.85 = \frac{P}{4.0}$ **1**

$P = 0.85 \times 4.0$ **1**

$P = 3.4$ (W) **1**

[8]

Q2.

(a) **Level 3**: The method would lead to the production of a valid outcome. All key steps are identified and logically sequenced. **5–6**

Level 2: The method would not necessarily lead to a valid outcome. Most steps are identified, but the plan is not fully logically sequenced. **3–4**

Level 1: The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear. **1–2**

No relevant content **0**

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Indicative content

- measure the current in **R** using the ammeter
- measure the p.d. across **R** using the voltmeter
- vary the resistance of the variable resistor
  (or vary the number of cells or use a variable power supply)
- record a range of values of current and p.d.

- ensure current is low to avoid temperature increase
- switch circuit off between readings
- reverse connection of **R** to power supply
- repeat measurements of I and V in negative direction
- plot a graph of current against p.d.

(b) current and p.d. would not be directly proportional
or
I-V graph would not be straight
or
I-V graph would be curved

1

(because) resistance of **R** would increase

1

(c) 0.2 (A)

1

(d) any **one** from:

- less chance of misreading
- no parallax error
  allow position of eye(s) does not affect reading

- it can give a reading closer to the true value
  allow 'it is more accurate'
  ignore 'no human error' ignore 'easier to read'

1

[10]

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