

- 6 (a) Define *potential difference* (p.d.).

.....[1]

- (b) A power supply of e.m.f. 240V and zero internal resistance is connected to a heater as shown in Fig. 6.1.



Fig. 6.1

The wires used to connect the heater to the power supply each have length 75m. The wires have a cross-sectional area 2.5mm^2 and resistivity $18\text{n}\Omega\text{m}$. The heater has a constant resistance of 38Ω .

- (i) Show that the resistance of each wire is 0.54Ω .

[3]

- (ii) Calculate the current in the wires.

current = A [3]

- (iii) Calculate the power loss in the wires.

power = W [3]

- (c) The wires to the heater are replaced by wires of the same length and material but having a cross-sectional area of 0.50 mm^2 . Without further calculation, state and explain the effect on the power loss in the wires.

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.....[2]