6

The circuit is used to supply energy to the battery from the generator. A variable resistor of resistance *R* is used to control the current in a circuit, as shown in Fig. 6.1.

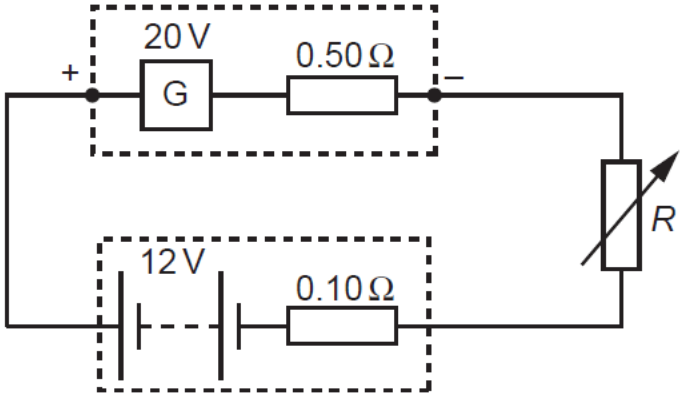

Fig. 6.1

The generator G has e.m.f. 20 V and internal resistance 0.50 Ω. The battery has e.m.f. 12 V and internal resistance 0.10 Ω. The current in the circuit is 2.0 A.

(a) Determine the resistance R.

resistance R = ……..…… Ω [2]

(b) Calculate the total power generated by G

power = ... W [2]

(c) Calculate the power loss in the total resistance of the circuit.

Power loss = ... W [2]

(d) Determine the efficiency of the circuit.

efficiency = ... [3]

(e) A student suggests that the value of resistance R will not affect the efficiency calculated in **(d).** Explain if you agree with the student.

……

…….. [1]

[Total: 10]