

4.6.2 Electricity Paper 2 (448/2)

EXERCISE 1

1. (a) Using the materials and equipment provided, connect the circuit shown in **Figure 1** on a bread board. (3 marks)

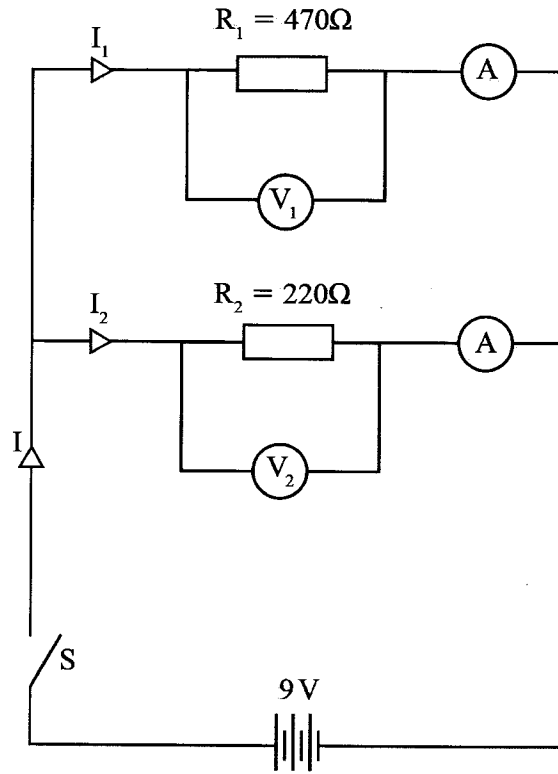


Figure 1

Let the examiner check your work.

- (b) Close switch S, measure and record the values of the following quantities in **Table 1(a)**. (4 marks)

Table 1(a)

	MEASURED VALUES
Current I_1	
I_2	
Voltages V_1	
V_2	

- (c) Using the same materials provided in 1(a), connect the circuit shown in **Figure 2**. (3 marks)

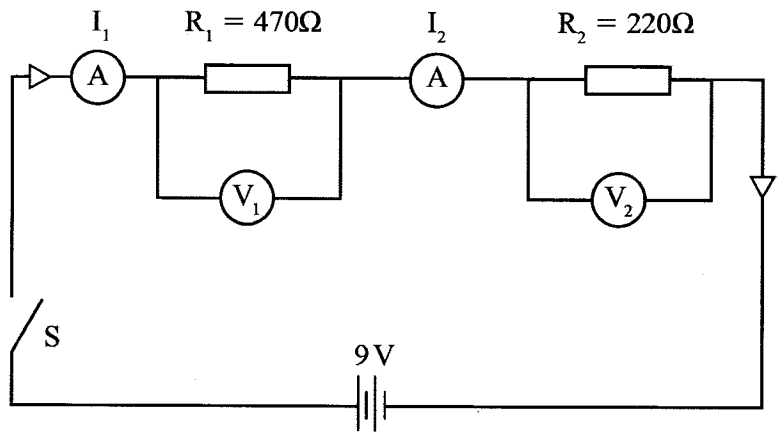


Figure 2

Let the examiner check your work.

- (d) Close switch S and record the values of the following quantities in **Table 1(b)**. (4 marks)

Table 1(b)

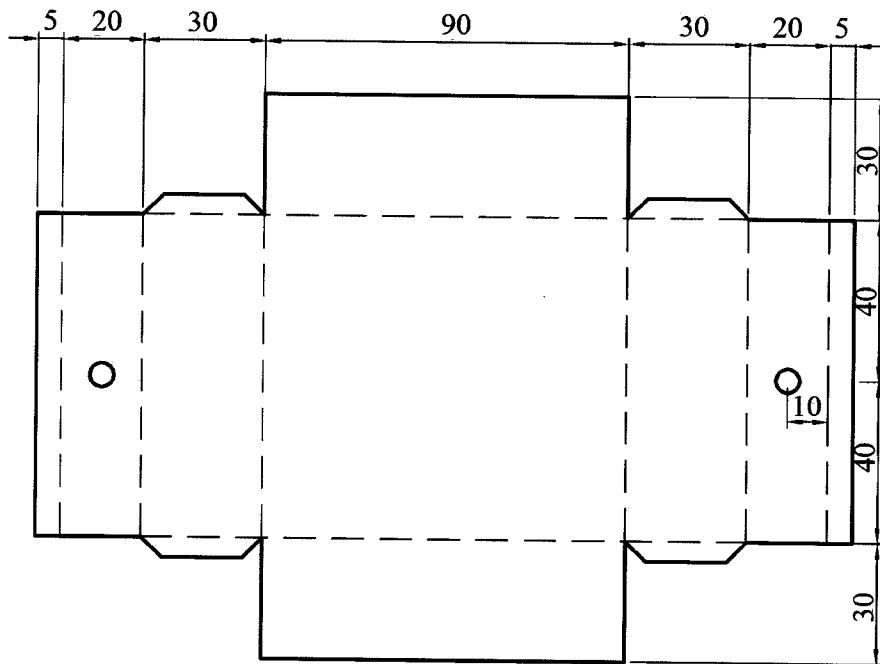
	MEASURED VALUES
Current I ₁	
I ₂	
Voltages V ₁	
V ₂	

- (e) State the reason for the differences between measured values obtained in **Table 1(a)** and **1(b)**. (6 marks)

EXERCISE 2

2. Use the tools and materials provided to fabricate the electronic components tray shown in Figure 3.

(20 marks)



Development

NB: – All flaps are 5 mm and soldered
– All seams are 5 mm

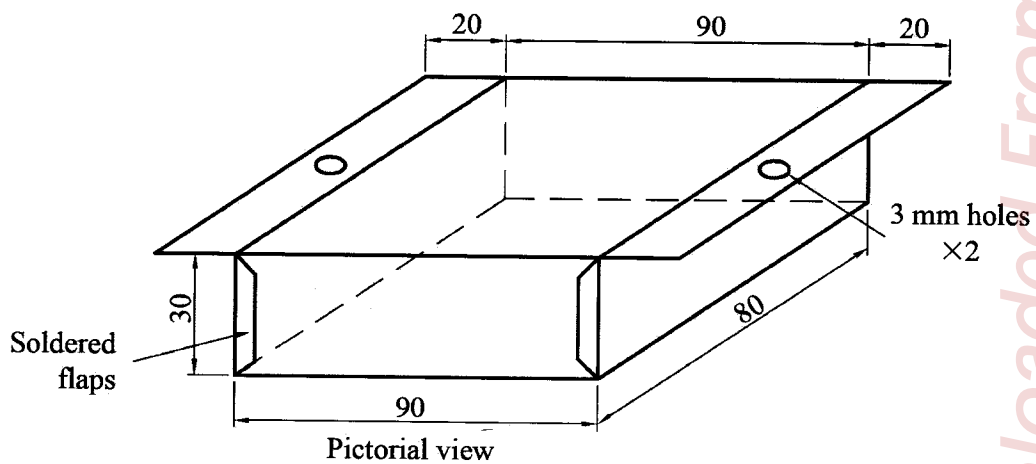


Figure 3

EXERCISE 3

3. Using the tools, materials and equipment provided, carry out the following tasks:

- (a) Terminate the top plug to a functional electric kettle. (12 marks)
- (b) Measure and record values of resistance for each test conducted. Record your values in **Table 2**. (6 marks)

Table 2

MEASUREMENTS	RESISTANCE (Ohms)
Live and neutral at plug	
Live and earth at plug	
Neutral and earth at plug	
Neutral at plug and kettle	
Live at plug and kettle	
Earth at plug and kettle	

- (c) Name the tests carried out in (b). (2 marks)

EXERCISE 4

4. Figure 4 shows a block diagram of the electronics circuit board provided.

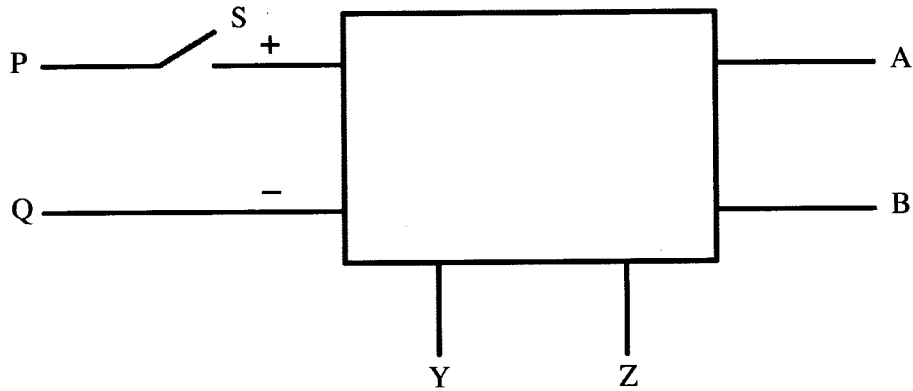


Figure 4

Perform the following tasks:

- (a) With switch S open, connect the circuit to the equipment as follows:

- (i) P and Q to 9 volts D.C. power supply.
- (ii) A and B to a voltmeter.
- (iii) Y and Z to an ammeter.

(3 marks)

Let the examiner check your work.

- (b) (i) Adjust the potentiometer and for each of the corresponding value of voltage measured; measure and record the current in **Table 3**.

- (ii) For each measured and recorded values of current and voltage; calculate the power dissipated and fill the values in **Table 3**.

(7 marks)

Table 3

V (volts)	0.8	1.2	1.8	1.85	1.9	1.95	2.0
I (mA)							
P (watts)							

(c) Plot a graph of current (mA) against voltage (V). (8 marks)

(d) From the graph determine the voltage at which the LED just turns ON. (2 marks)

..... V

EXERCISE 5

5. **Figure 5** shows the layout of a lighting circuit. Using the materials and tools provided, install the circuit such that the one way switch operates the lamp. (20 marks)

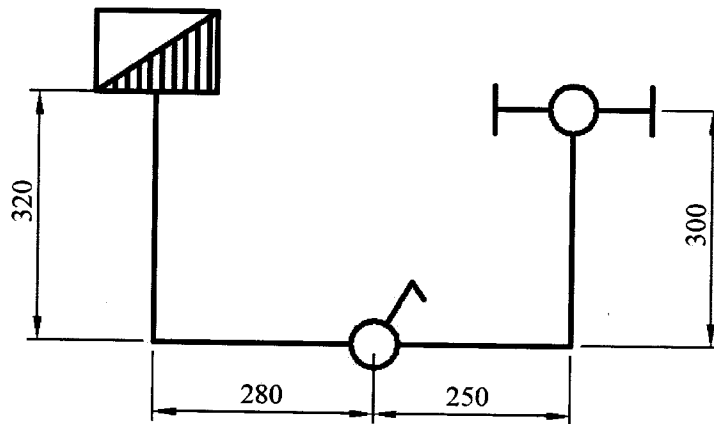


Figure 5