3.20.2 Electricity Paper 2 (448/2)

EXERCISE 1

1. (a) Using materials and equipment provided, connect the circuit as shown in **Figure 1**.

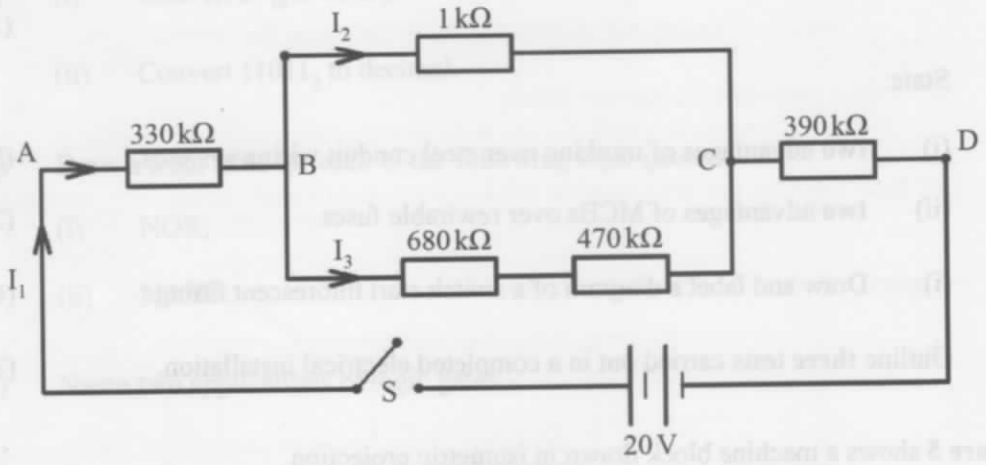


Figure 1

Let the examiner check your work. (7 marks)

(b) Close the switch **S**, measure and record the values of the following quantities in **Table 1**. (6 marks)

Table 1

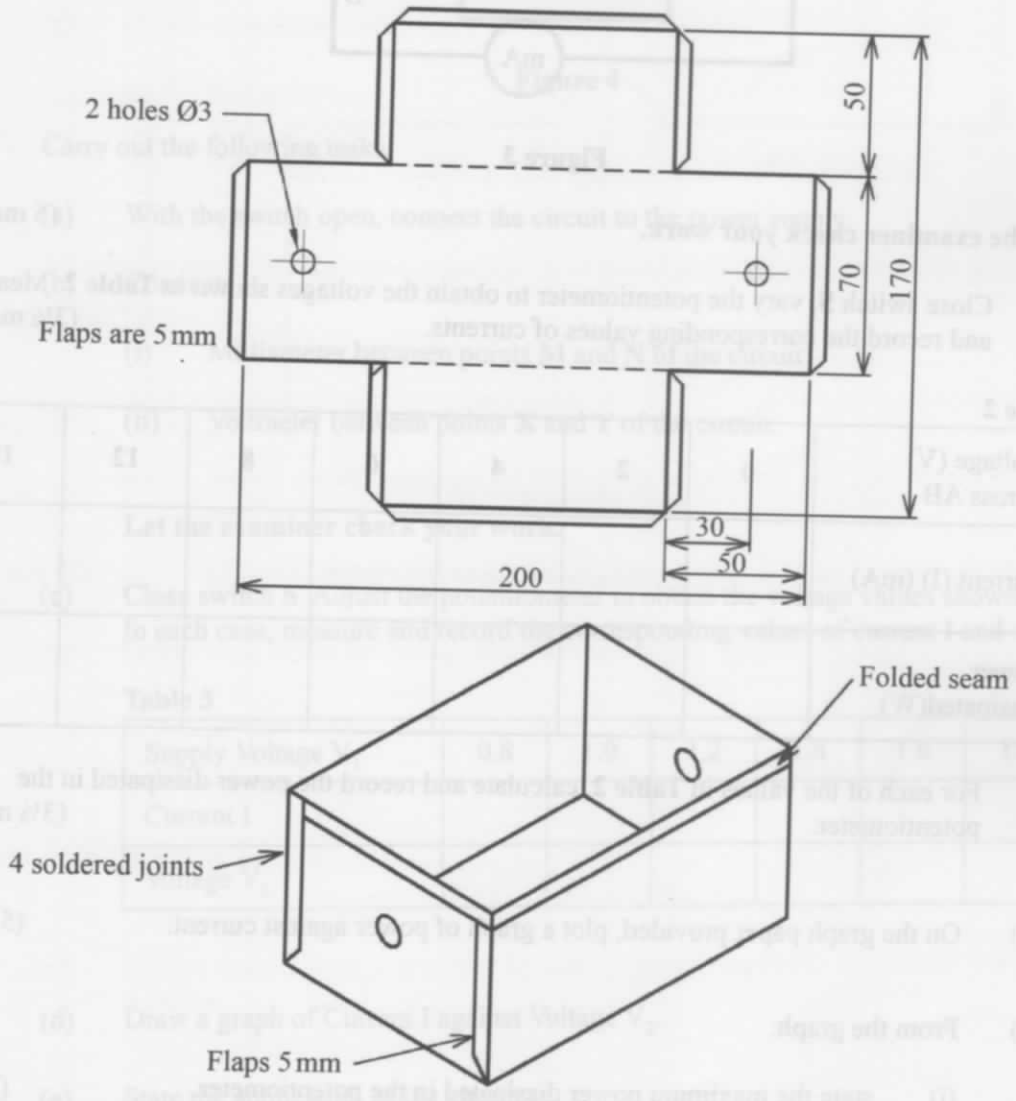
Quantity		Measured Value	Calculated Value
Current	I_1		
	I_2		
	I_3		
Voltage drop across		**Measured Value**	**Calculated Value**
AB			
BC			
CD			

(c) Calculate and record the corresponding current and voltage values of the measured values.
(6 marks)

(d) Give reasons for the differences between the measured values and the calculated values.
(1 mark)

EXERCISE 2

2. Using the tools, materials and equipment provided, fabricate the metallic tray in **Figure 2**.
(20 marks)



Assembled Tray

Figure 2

EXERCISE 3

3. (a) Using the materials and equipment provided, connect the circuit as shown in **Figure 3**.

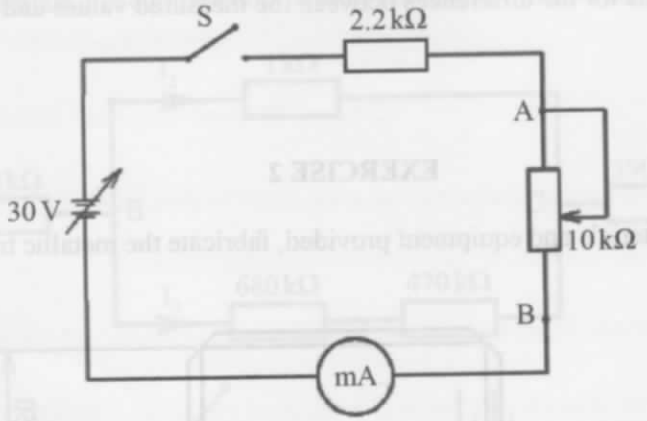


Figure 3

Let the examiner check your work. (5 marks)

(b) Close switch **S**, vary the potentiometer to obtain the voltages shown in **Table 2**. Measure and record the corresponding values of currents. (3½ marks)

Table 2

Voltage (V) across AB	**0**	**2**	**4**	**6**	**8**	**12**	**16**
Current (I) (mA)							
Power dissipated(W)							

(c) For each of the values in **Table 2**, calculate and record the power dissipated in the potentiometer. (3½ marks)

(d) On the graph paper provided, plot a graph of power against current. (5 marks)

(e) From the graph:

(i) state the maximum power dissipated in the potentiometer. (1 mark)

(ii) determine the resistance of the potentiometer at maximum power. (1 mark)

(f) state **one** application of the circuit. (1 mark)

EXERCISE 4

4. **Figure 4** shows the block diagram of a prefabricated circuit **P**.

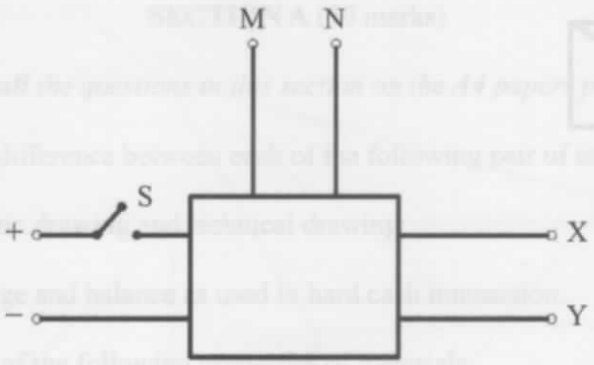


Figure 4

Carry out the following tasks:

(a) With the switch open, connect the circuit to the power supply.

(b) Connect:

(i) Milliameter between points **M** and **N** of the circuit;

(ii) Voltmeter between points **X** and **Y** of the circuit. (3 marks)

Let the examiner check your work.

(c) Close switch **S**. Adjust the potentiometer to obtain the voltage values shown in **Table 3**. In each case, measure and record the corresponding values of current I and voltage V_2.

Table 3

Supply Voltage V_1	0.8	1.0	1.2	1.4	1.6	1.8	2.0
Current I							
Voltage V_2							

(7 marks)

(d) Draw a graph of Current I against Voltage V_2. (8 marks)

(e) State the application of the circuit. (1 mark)

(f) Name the device **P**. (1 mark)

EXERCISE 5

5. **Figure 5** shows the layout of a power final circuit.

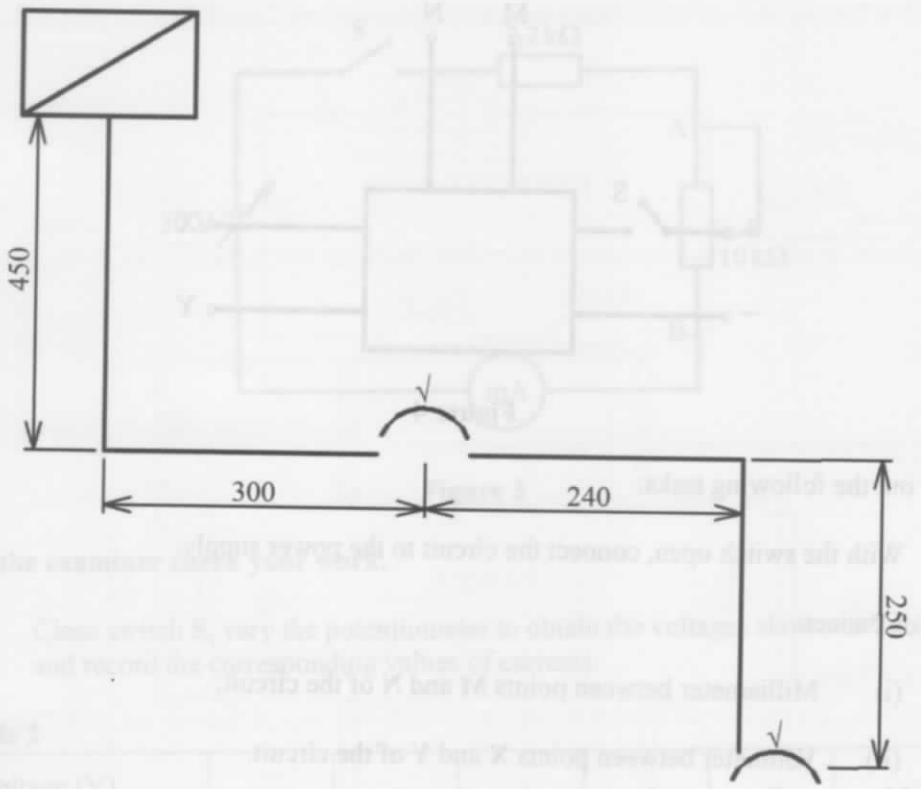


Figure 5

Using PVC sheathed cable wiring system, install the radial circuit. (20 marks)