

### 3.20.2 Electricity Paper 2 (448/2)

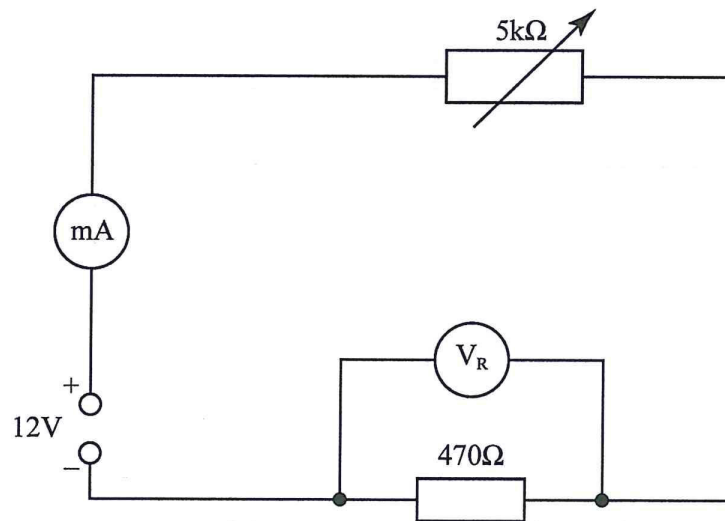
#### EXERCISE 1

1. Using the materials, equipment and measuring instruments provided, perform the following tasks:

- (a) Connect the circuit as shown in **Figure 1**.

Let the examiner check your work.

(3 marks)



**Figure 1**

- (b) Turn the power ON and adjust the potentiometer to obtain each of the voltages ( $V_R$ ) shown in **Table 1**. In each case read and record the corresponding current  $I$ . (6 marks)

**Table 1**

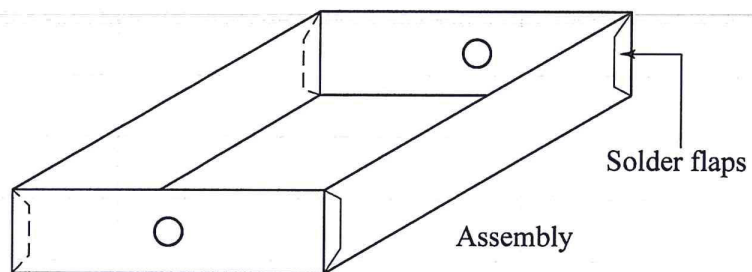
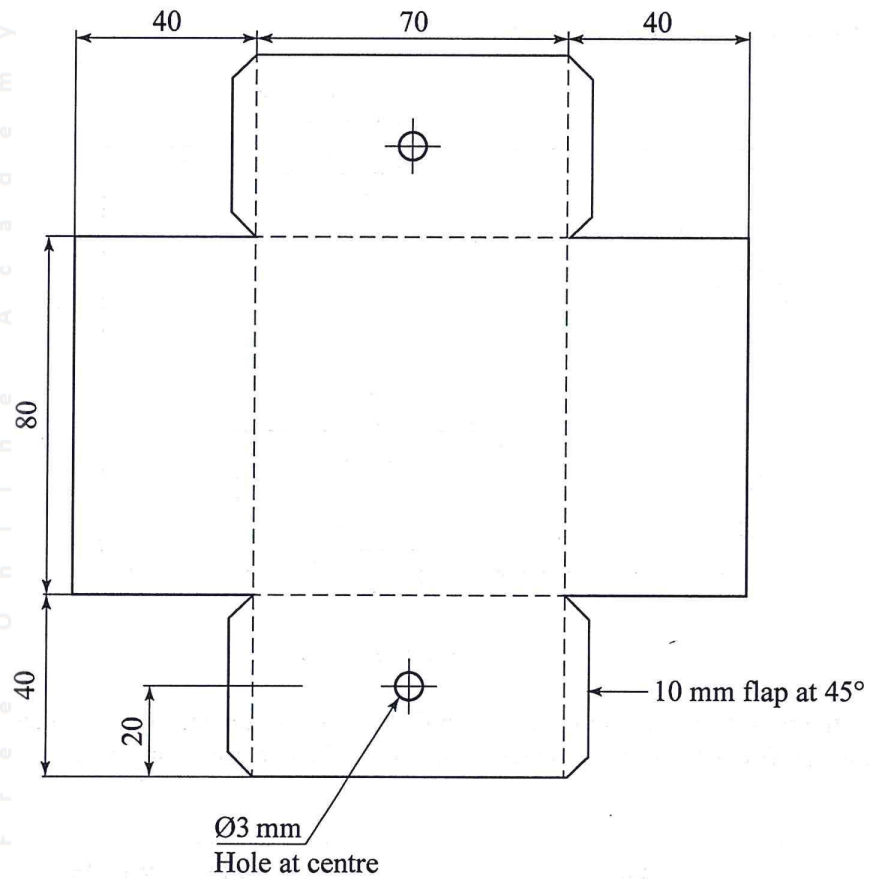
$V_R$	$I(\text{mA})$	POWER (mW)
3		
4		
5		
6		
7		
8		

- (c) For each value of  $V_R$ , calculate the power dissipated in the  $470\Omega$  resistor and complete the table. (6 marks)
- (d) Using the values in **Table 1**, draw the graph of power against voltage  $V_R$ . (4 marks)
- (e) State **two** applications of the circuit. (1 mark)

## EXERCISE 2

2. Use the tools, equipment and materials provided to make an electronic circuit casing shown in **Figure 2**. (20 marks)

Let the examiner check your work.



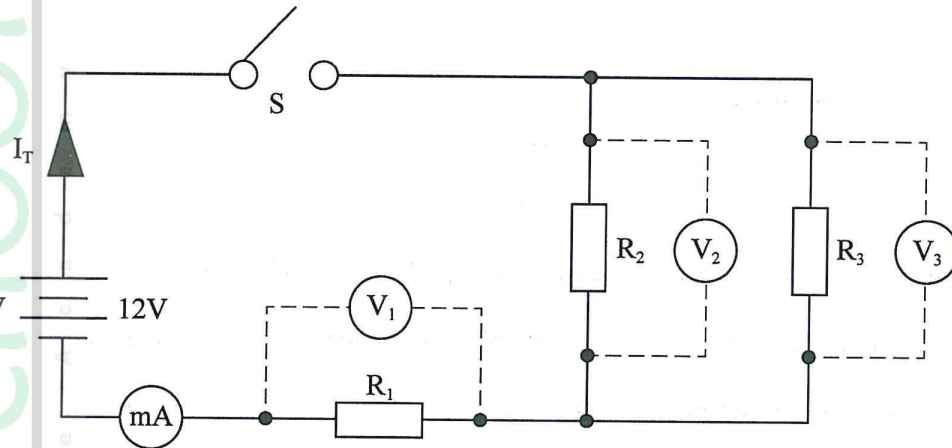
**Figure 2**

### EXERCISE 3

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

Let the examiner check your work.

(6 marks)



**Figure 3**

- (b) Put ON the power supply. Close switch S, measure and record current through the following resistors: (3 marks)

$R_1 =$  .....

$R_2 =$  .....

$R_3 =$  .....

- (c) Measure the total circuit current,  $I_T$ . (2 marks)

$I_T =$  .....

- (d) Measure and record the voltages across the following resistors:

$R_1 =$  .....

$R_2 =$  .....

$R_3 =$  ..... (6 marks)

- (e) Using the values in (c) and (d) above, calculate the value of the resistors:

$R_1 =$  .....

$R_2 =$  .....

$R_3 =$  .....

$R_T =$  ..... (3 marks)

#### EXERCISE 4

4. Figure 4 shows a block diagram of a prefabricated electronic circuit.

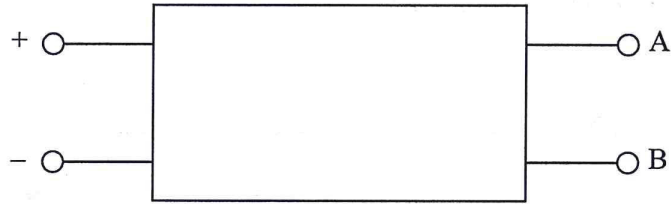


Figure 4

Using the equipment and accessories provided, perform the following tasks:

- (a) Connect the circuit to the power supply through the PBNO switch provided.

**Let the examiner check your work.**

(2 marks)

- (b) Press and hold the PBNO switch for about 10 seconds and describe the behaviour of the LEDS:

.....

.....

(1 mark)

- (c) (i) Connect the  $10\text{k}\Omega$  resistor at A and B.

**Let the examiner check your work.**

(1 mark)

- (ii) Press and hold the switch. Count the number of times each LED flashes in one minute:

RED .....

GREEN .....

(4 marks)

- (d) Draw the schematic diagram of the circuit.

(10 marks)

- (e) State:

- (i) the name of the circuit

(1 mark)

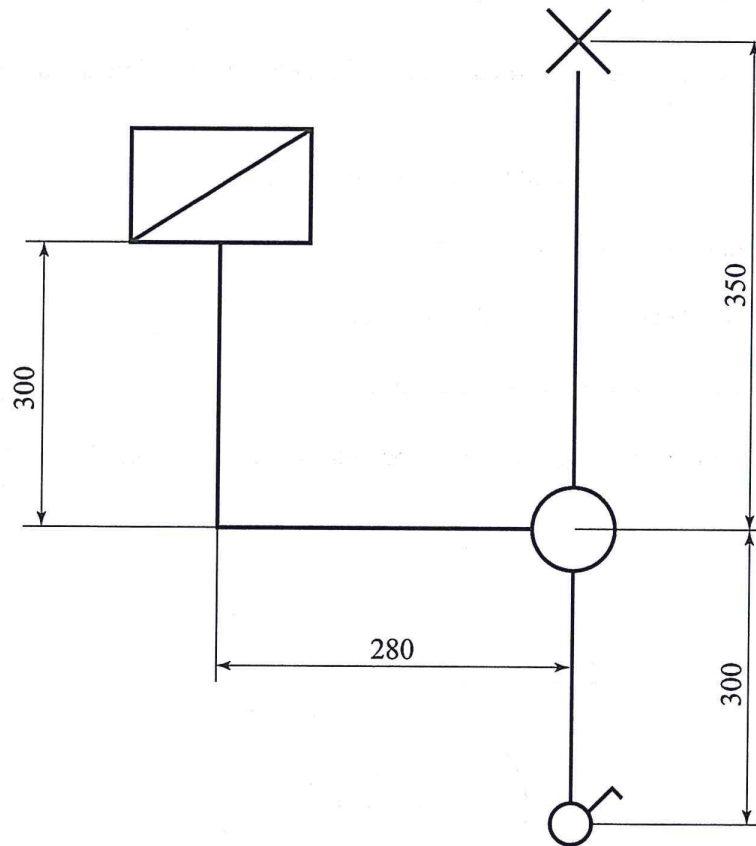
- (ii) application of the circuit.

(1 mark)

### EXERCISE 5

5. **Figure 5** shows a layout of a final circuit, using PVC conduit wiring system, install the circuit such that the lamp is controlled by the one way switch. (20 marks)

Let the examiner check your work.



**Figure 5**