

29.19.2 Electricity Paper 2 (448/2)

Name

Index No.

448/2
ELECTRICITY
Paper 2
(PRACTICAL)
Oct./Nov. 2008
2½ hours

Candidate's Signature.....

Date

THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
ELECTRICITY
Paper 2
(PRACTICAL)
2½ hours

Instructions to Candidates

Write your name and index number in the spaces provided above.

Sign and write the date of examination in the spaces provided above.

There are FIVE exercises in this paper, attempt ALL the exercises.

Candidates are allowed 30 minutes for each exercise.

Each exercise will be awarded a maximum of 20 marks.

At each station, candidates are not allowed to either review the previous station's work or read instructions for the other stations.

For Examiner's use Only

EXERCISES	1	2	3	4	5	TOTAL
MARK (EC)						
MARKS (MC)						

This paper consists of 9 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing.

EXERCISE 1

Using the components, materials and equipment provided:

- (a) Connect the circuit as shown in figure 1. (3 marks)

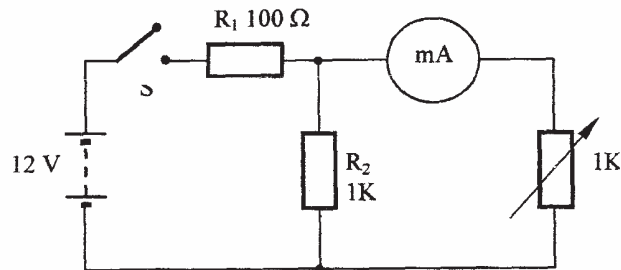


Figure 1

- (b) With the switch S open, adjust the power supply to 12v. Let the examiner check your work. (1 mark)
- (c) Adjust the variable resistor to obtain the current values shown in table 1. For each of the current values, measure and record the corresponding voltages.

Table 1

I (mA)	10	20	30	40	50	60
V_R (V)						

(6 marks)

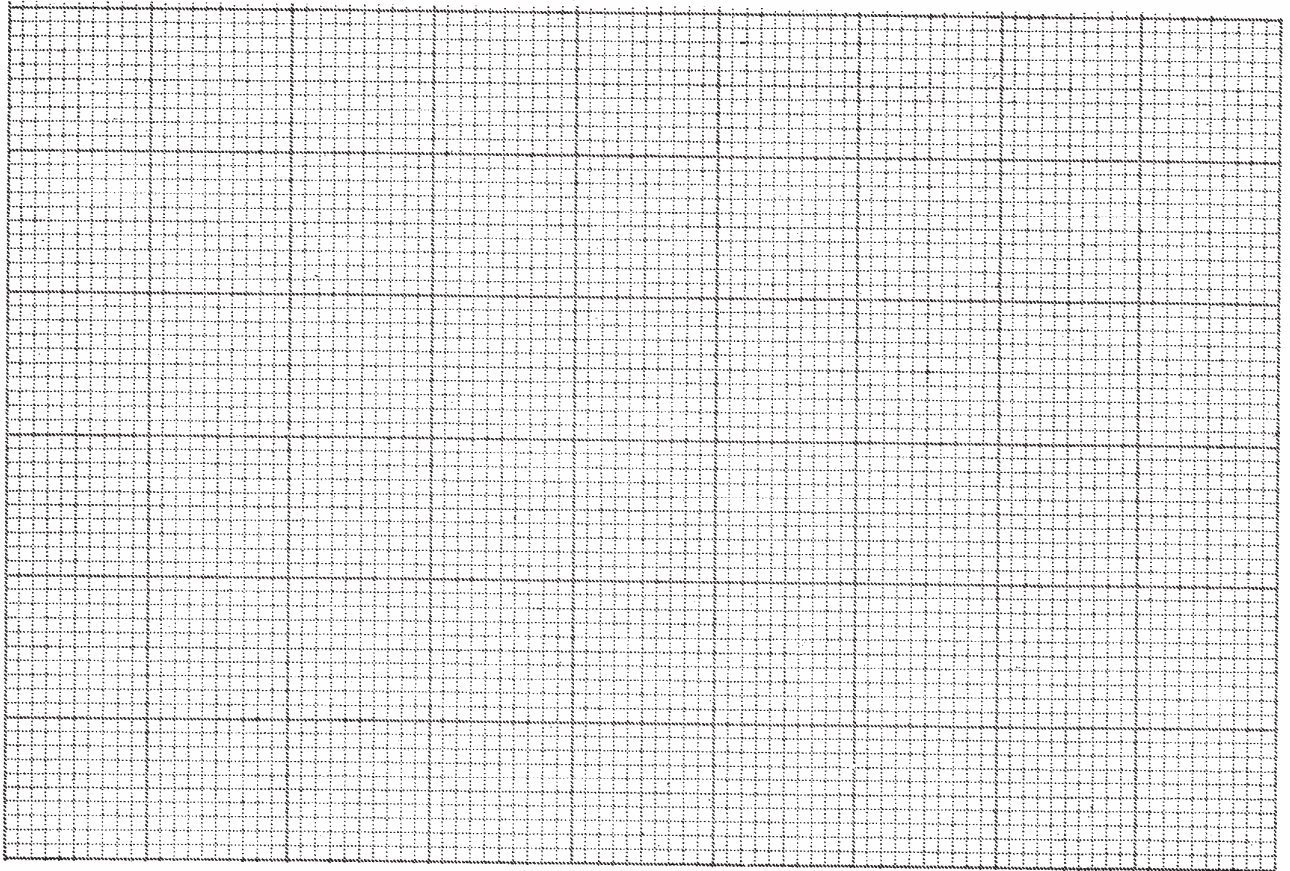
- (d) Adjust the potentiometer to $1K\Omega$. Measure and record the current through:

(5 marks)

- (i) R1 _____
- (ii) R2 _____

(e) Plot the graph of voltage against current.

(3 marks)



(f) From the graph, determine the voltage when the current is 35mA.

(2 marks)

EXERCISE 2

Using the tools, materials and equipment provided, fabricate the stand as shown in figure 2.
(20 marks)

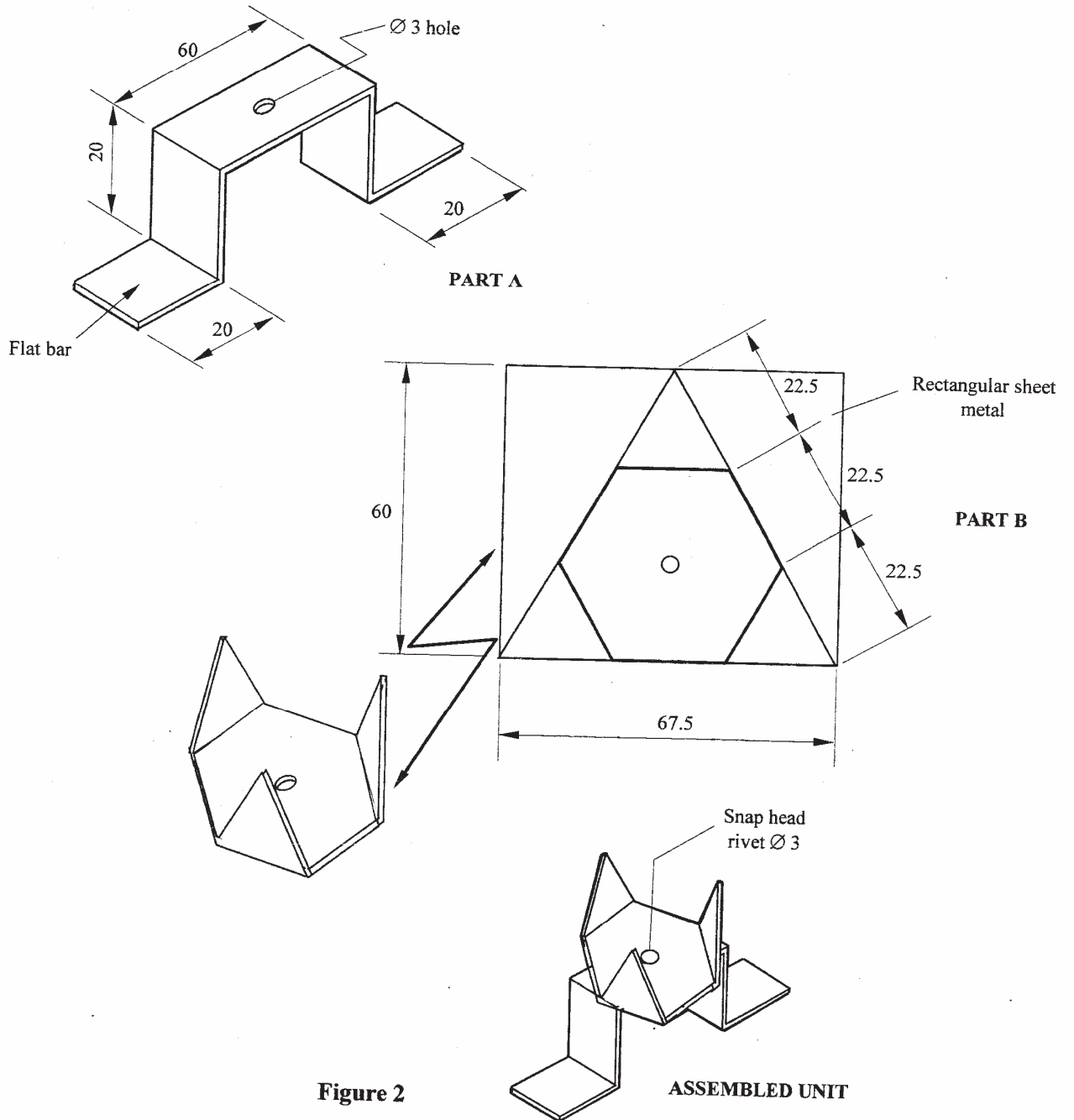


Figure 2

ASSEMBLED UNIT

EXERCISE 3

Using the components, materials and equipment provided, carry out the following tasks:

- (a) Connect the circuit as shown in figure 3.

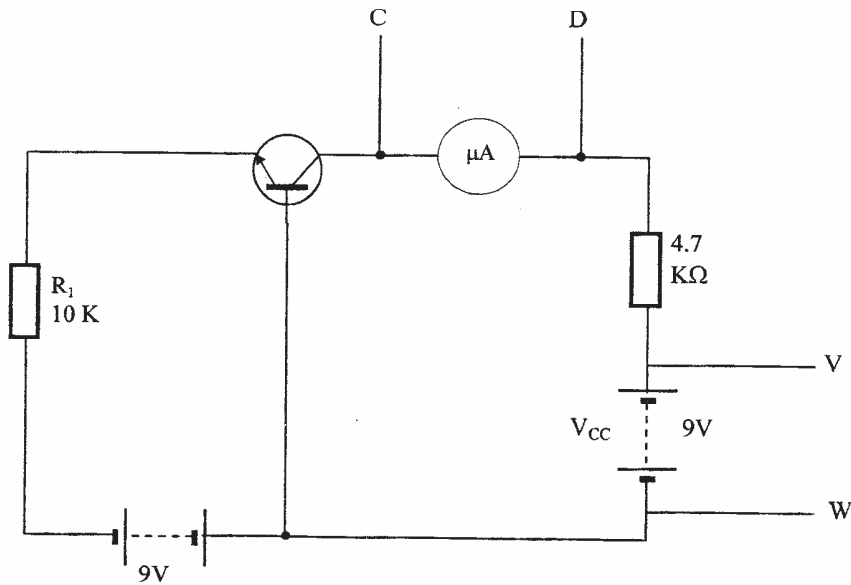


Figure 3

(5 marks)

Let the examiner check your work.

- (b) Adjust V_{cc} to the values shown in table 2 and for each voltage value measure and record the corresponding value of the collector current, I_c

(6 marks)

Table 2

V_{cc} (v)	9	7	5	3	1	0.5
I_c (mA)						

- (c) Repeat step in (b) above for the V_{cc} values shown in table 3 and complete the table.

(3 marks)

Table 3

V_{cc} (v)	10	8	6	4	2	0.5
I_c (mA)						

(d) From the results obtained in (b) and (c) above, make two comments about the collector current I_c . (4 marks)

(e) State **two** factors that determine the value of collector current. (2 marks)

EXERCISE 4

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

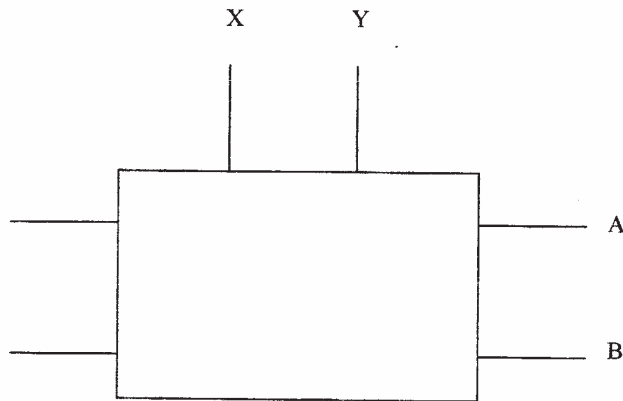


Figure 4

Perform the following tasks:

(a) Adjust the power supply to 10V. (1 mark)

(b) Connect the milliammeter between points X and Y then connect the circuit to the power supply.
Let the examiner check your work. (1 mark)

(c) Turn on the power supply.

(d) Measure and record the following:

(i) Potential drop across A – B

V =

(ii) Voltage across R_s

V =

(iii) the circuit current

I =

(6 marks)

- (e) Increase the power supply to 12v and repeat steps (d) (i) (ii) and (iii) above.
- (i)
- (ii)
- (iii) (6 marks)
- (f) When voltage was increased from 10 to 12 volts, comment on the:
- (i) voltage across R_L ;
- (ii) voltage across R_S ;
- (iii) current through R_S (3 marks)
- (g) State the function of component Q in the circuit. (2 marks)
- (h) Disconnect the circuit and let the examiner check your work. (1 mark)

EXERCISE 5

Figure 5 shows a layout of a final sub-circuit. Using PVC conduit wiring system, install the circuit such that the lamp is controlled from the two switching positions. (15 marks)

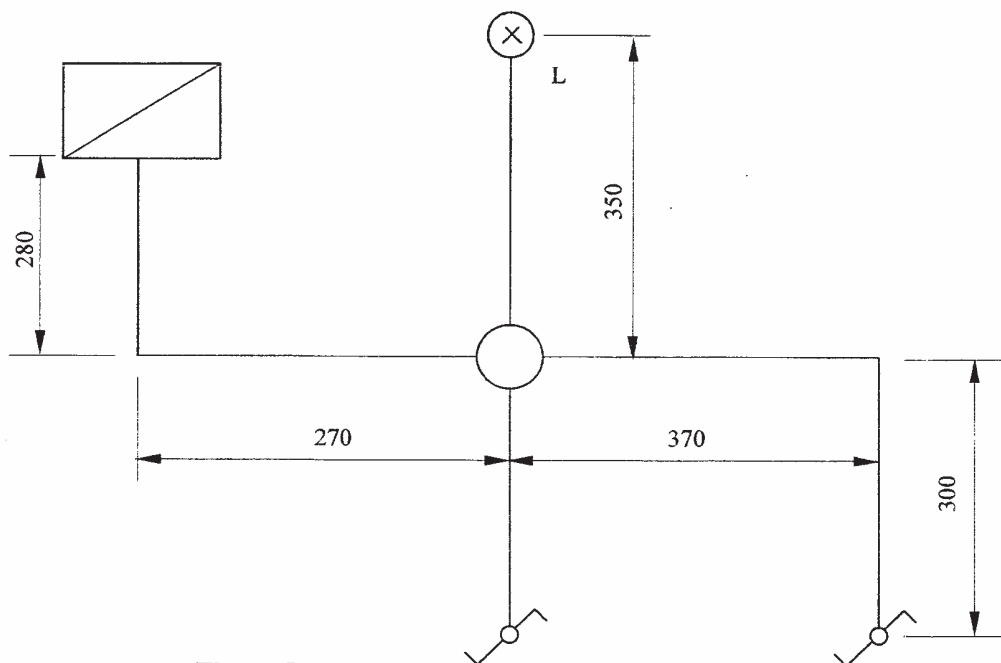


Figure 5