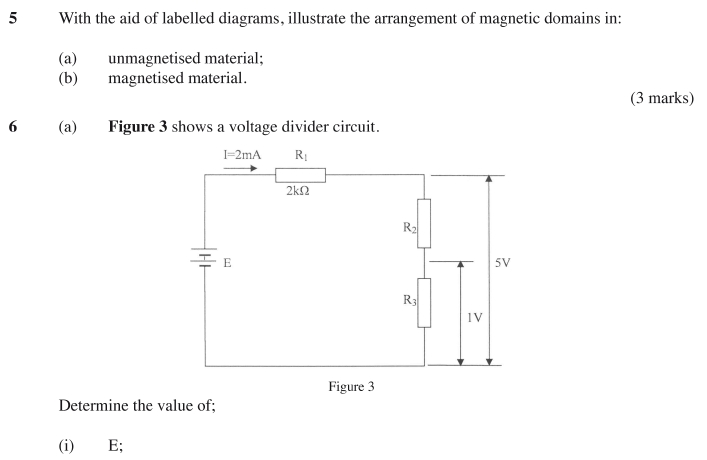
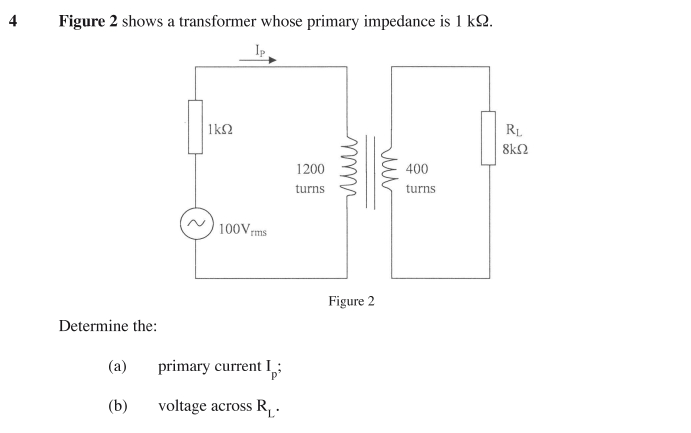


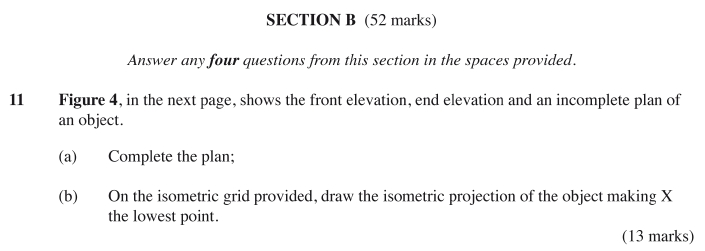
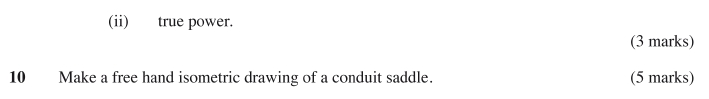
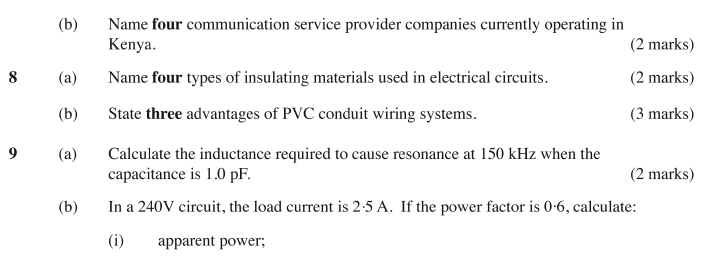
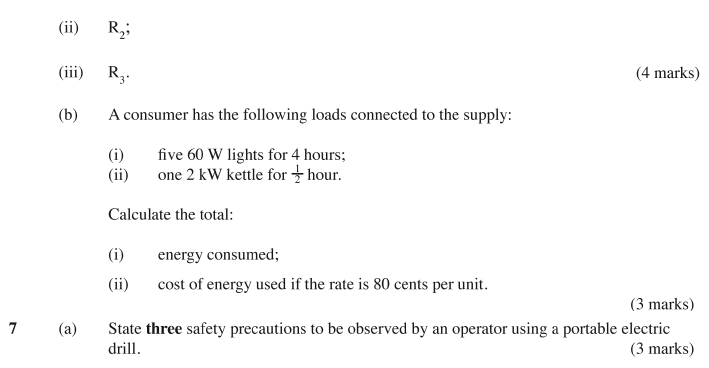
**3.20** **ELECTRICITY (448)**

**3.20.1  Electricity Paper 1 (448/1)**

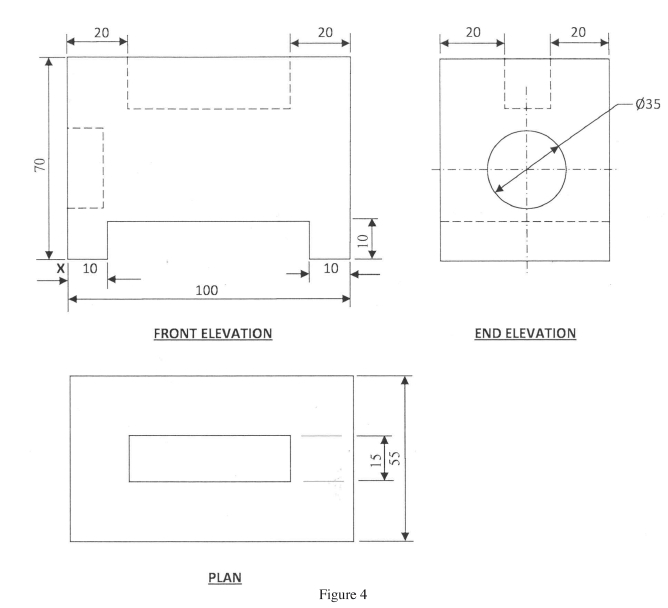
178



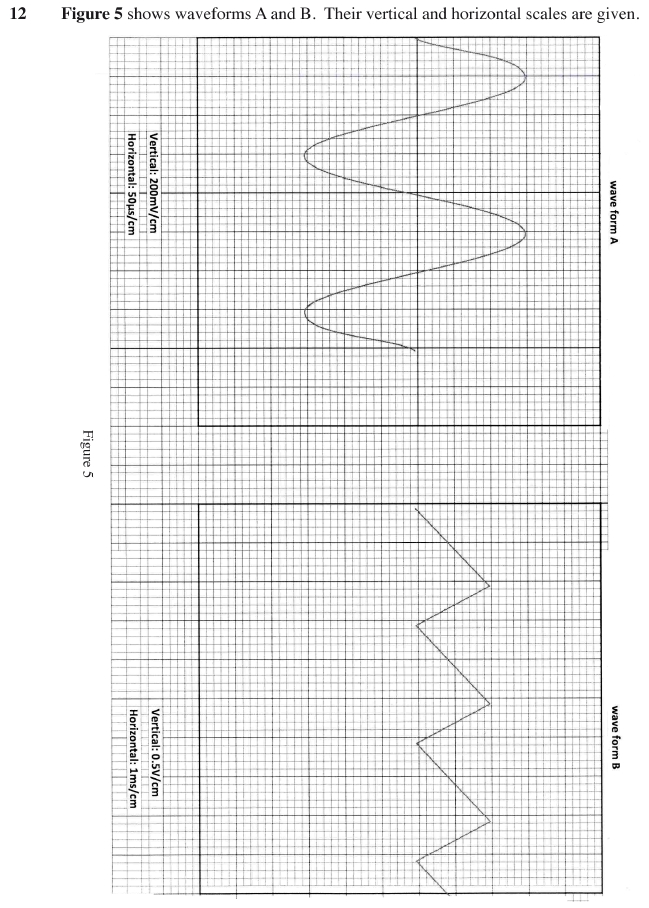
179



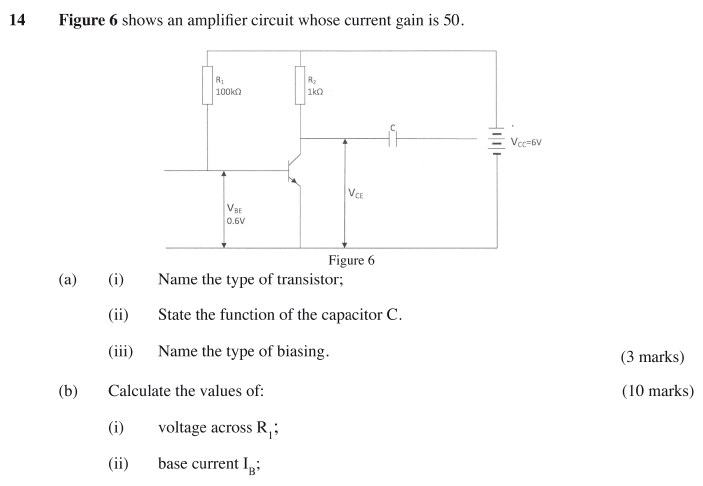
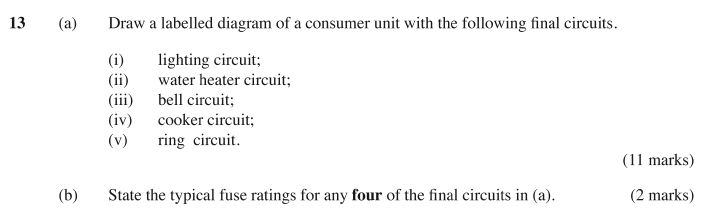
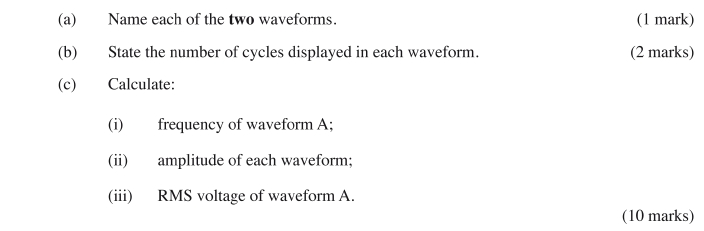
180



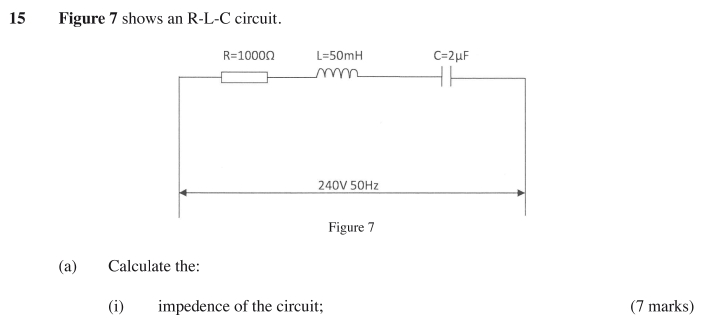
181



182



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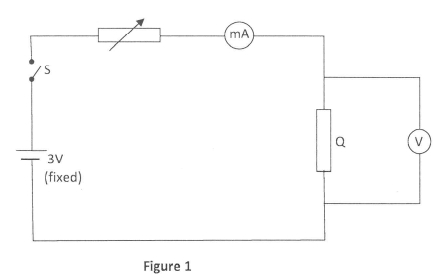
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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Current I(mA) | 40 | 100 | 200 | 240 | 260 |
| Voltage (V) |  |  |  |  |  |
| V  I |  |  |  |  |  |

case record the corresponding voltage values. (7 2  marks)

(iv) Calculate the values of   V and record them in the spaces provided in the table.

(v) Use the values in the table to draw a graph of voltage against current. (5 2  marks)



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

**EXERCISE 1**

**1** Using materials, components and equipment provided, perform the following tasks.

(i) Connect the circuit shown in**figure 1**. (3 marks)

Let the examiner check your work.

Potentiometer

R1

(ii) Close switch S.

(iii) Adjust the potentiometer for the ammeter to obtain current values in table 1 and in each

1

**Table 1**

I

1

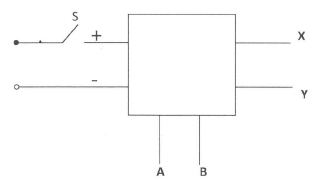
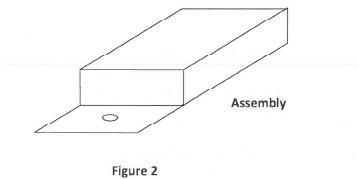
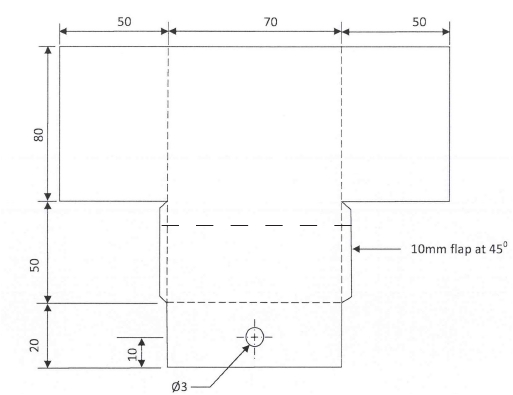
(vi) Determine the slope of the graph. (2 marks)

(vii) From the graph, determine the voltage, V when the current I = 160 mA.

V =  ..................................................................................................(1 mark)

(viii) State the purpose of the experiment. (1 mark)

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**EXERCISE 2**

**2** Use the tools, equipment and materials provided to make the bracket shown in**figure 2**.

(20 marks)

**EXERCISE 3**

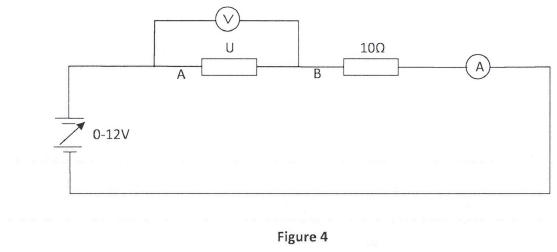
**3** **Figure 3** shows a block diagram of the electronic circuit provided.

Figure 3

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|  |  |  |
| --- | --- | --- |
| Resistor (Ω) | VR | 2  P  VR  R |
| 56 |  |  |
| 220 |  |  |
| 390 |  |  |
| 680 |  |  |
| 1000 |  |  |

(i) connect each resistor between terminals A and B; (2 2  marks)



Perform the following tasks:

(a) With the switch S open, connect the circuit to the DC power source.  Let the examiner

check your work. (1 mark)

(b) Set the potentiometer to 0 Ω as measured with ohmeter.  Select a value of resistor

shown in table 2 and in each case, do the following:

1

(ii) close the switch, measure the voltage and record in table 2. (5 marks)

**Table 2**

(iii) Calculate the power dissipated by each resistor and complete table 2.

(5 marks)

1

(iv) Draw a graph of power against resistance. (5 2  marks)

examiner see your work. (2 2  marks)

(v) From the graph, determine the value of R for which there is maximum power

transfer. (1 mark)

**EXERCISE 4**

**4** Use the components and equipment to connect the circuit illustrated in**figure 4**.  Let the

1

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Perform the following tasks:

a) Switch on the power supply.

b) Adjust the power supply to obtain each of the voltage values across U as shown in

**table 3** and in each case, record the corresponding current: (5 marks)

**Table 3**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| V | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 |
| I |  |  |  |  |  |

c) Switch off the power supply and reverse its connections.

d) Adjust the power supply to obtain each of the voltage values across U as shown in

**table 4** and in each case, record the corresponding current. (5 marks)

**Table 4**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| V | -0.5 | -1 | -3 | -4 | -5 |
| I |  |  |  |  |  |

e) Use the values of I and V from tables 3 and 4 to draw the graph of current (I) against

voltage (V) on the same axes. (7 marks)

f**)** From the shape of the graph, identify component U.

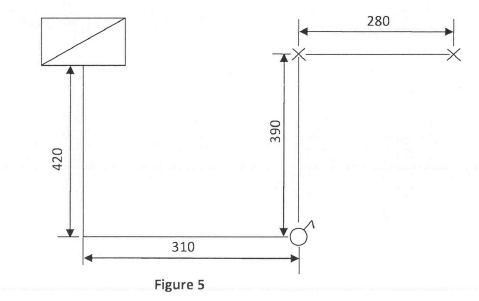
^(   12 marksh)

**EXERCISE 5**

**5** **Figure 5** shows the layout of a lighting installation.  Using PVC sheathed cables, install the

circuit such that the lamps are controlled at one point.

(20 marks)



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