

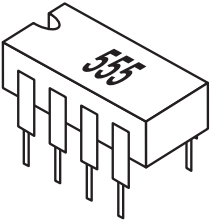
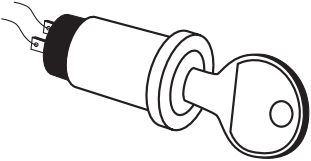
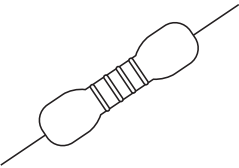
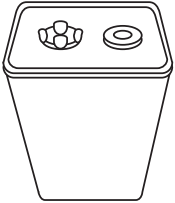
Answer ALL the questions. Write your answers in the spaces provided.

1. The table below shows some components and pieces of equipment.

(a) Complete the table by:

- (i) naming each component or piece of equipment
- (ii) describing its use.

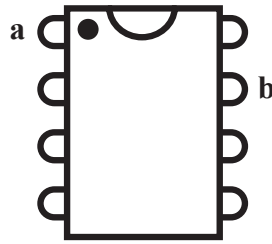
The first one has been done for you.

Component/Equipment	Name	Use
	555 timer IC	Creating timing pulses or time delays
		
		
		

(6)



(b) The diagram below shows a 555 timer IC.



(i) Give the number of leg 'a'. (1)

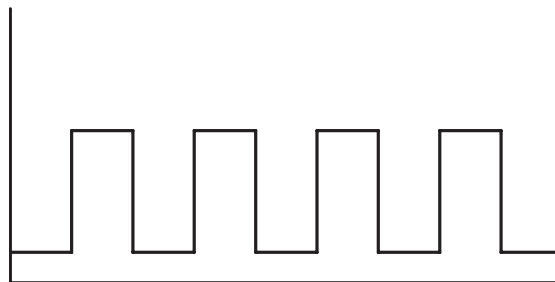
(ii) Give the number of leg 'b'. (1)

(iii) Mark with a cross (☒) which voltage could be used to power a 555 timer IC.

- 0.5 V 5.0 V 50 V (1)

(c) The graph below shows the waveform of a timer circuit.

Label the waveform to show the **mark** and the **space**.



(2)

Q1

(Total 11 marks)



2. A student is planning to make a pocket Lottery Number Generator.

(a) Name **one** suitable electronic component to display numbers from 0 to 9.

.....
(1)

(b) (i) Explain **one** reason why a battery would be a suitable power source for the Lottery Number Generator.

.....
.....
(2)

(ii) Name **two** types of battery that would be suitable for the Lottery Number Generator.

1
2
(2)

(c) The case of the Lottery Number Generator could be vacuum formed from rigid polystyrene sheet.

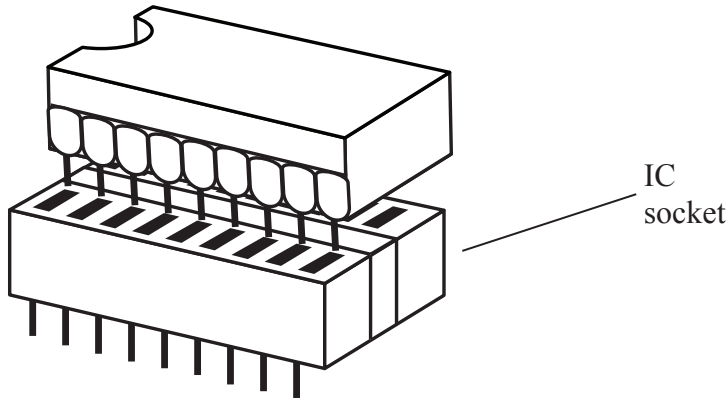
Explain **two** reasons why rigid polystyrene is suitable for the case.

1
.....
2
.....
(4)



(d) The student decides to use IC sockets when assembling the circuit.

Give **two** reasons why IC sockets are often used when assembling circuits.



- 1
-
- 2
-

(2)

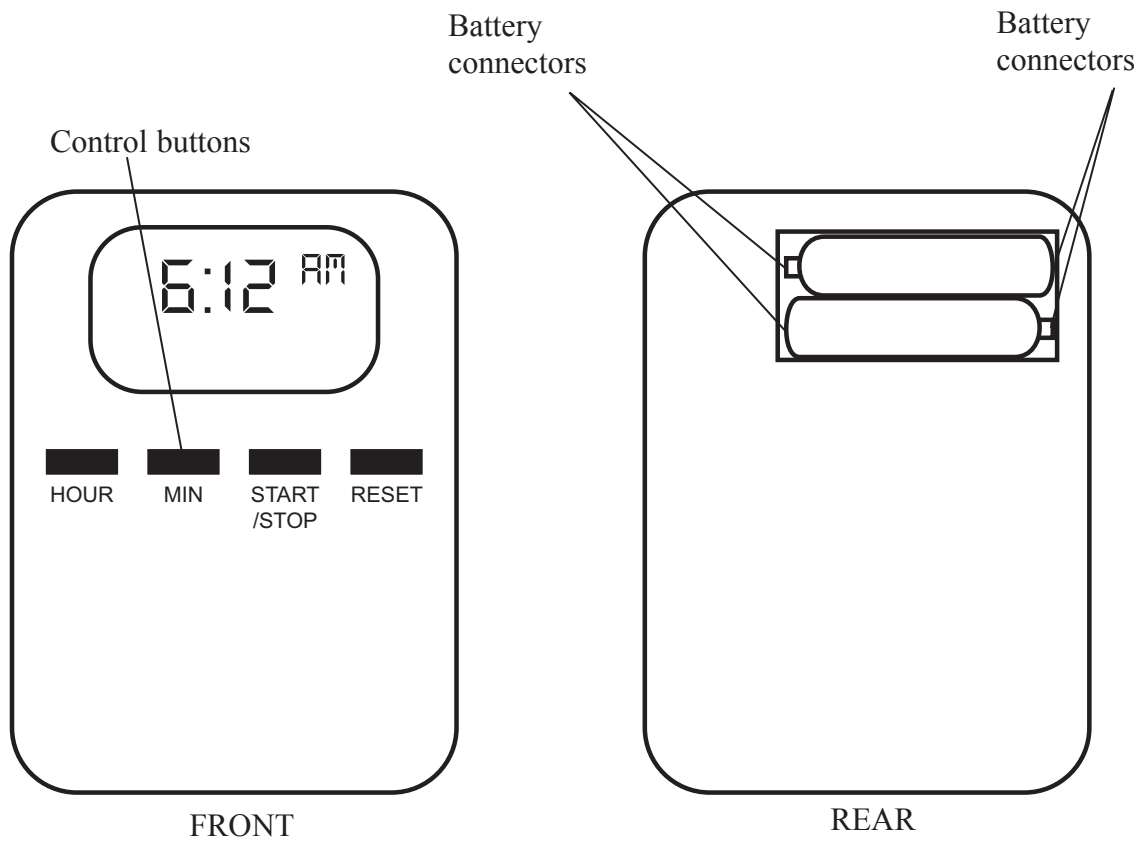
Q2

(Total 11 marks)

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3. The diagrams below show a digital timer.



(a) Two specification points for the timer are that it must be:

- easy to adjust the timing settings
- easy to read the display.

Under each of the following headings, give **one** more point that should be included in the specification for the timer.

For each point, give **one** reason why it should be included.

Quality.

Point

Reason

(2)

Environment.

Point

Reason

(2)

Safety.

Point

Reason

(2)



(b) The timer uses a 7-segment display.

One reason why a 7-segment display is used is because it is readily available.

Give **two** other reasons why a 7-segment display is suitable for this timer.

1

2 (2)

(c) The casing of the timer is manufactured using the injection moulding process.

Give **two** reasons why injection moulding is a suitable process for the manufacture of the casing.

1

.....

2

..... (2)

(d) The casing is assembled using solvent cement.

Explain **one** reason why solvent cement is used for assembling the casing.

.....

.....

..... (2)



(e) The battery connectors are made from brass.

Give **two** properties of brass that make it a suitable material for the battery terminals.

For each property give **one** reason why brass is suitable.

Property 1

Reason

.....

Property 2

Reason

.....

(4)

(f) The manufacturer of the batteries uses sampling during production.

Explain **one** reason for sampling during the manufacture of the batteries.

.....

.....

.....

(2)



(g) Two specification points for the timer are that it must be:

- easy to adjust the timing settings
- easy to read the display.

Explain, under the following headings, how the timer satisfies these specification points.

(i) Easy to adjust the timing settings.

.....
.....
.....
.....

(2)

(ii) Easy to read the display.

.....
.....
.....
.....

(2)

Q3

(Total 22 marks)

TOTAL FOR PAPER: 44 MARKS

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