



Rewarding Learning

General Certificate of Secondary Education
2013

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Candidate Number

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Technology and Design

Unit 1: Technology and
Design Core

[GTD11]

WEDNESDAY 15 MAY, MORNING

ML

TIME

1 hour, plus your additional time allowance.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

Complete in blue or black ink only. **Do not write in pencil or with a gel pen.**

Answer **all eleven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 90.

Quality of written communication will be assessed in question 11.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

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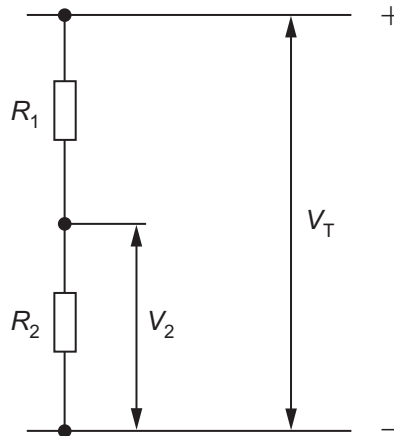
Formulae for GCSE Technology and Design

You should use, where appropriate, the formulae given below when answering questions which include calculations.

1 Potential Difference = current \times resistance ($V = I \times R$)

2 For potential divider

$$V_2 = \frac{R_2}{R_1 + R_2} \times V_T$$








3 Series Resistors $R_T = R_1 + R_2 + R_3 \text{ etc}$

4 Gear ratio of a simple gear train = $\frac{\text{number of teeth on driven gear}}{\text{number of teeth on driver gear}}$

- 1 Table 1 shows a number of different symbols. Use the first row as a guide to complete the table.

Table 1

Sketch of Symbol	Type of Symbol	Name of Symbol
	Electronic	Bulb
	Electronic	Voltmeter
	Mechanical	
		
		Use face shield
		Potentiometer
		

[9]

Examiner Only

Marks Remark

Total Question 1

2 Computer control systems are used to perform a range of functions.

The list below shows input and output devices that could be connected to a computer.

Choose and write down **three** input devices and **three** output devices from the list.

LIST:

- Printer
- Pressure Pad
- Toggle Switch
- CNC Machine
- Keyboard
- Electric Motor

input device 1 _____

input device 2 _____

input device 3 _____ [3]

output device 1 _____

output device 2 _____

output device 3 _____ [3]

Examiner Only

Marks	Remark
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Total Question 2	

[Turn over

- 3 (a) Complete **Table 2**. Write down the correct type of motion from the list below.

Table 2

Motion	Type of motion
An Electric motor	
Car windscreen wipers	
Using a hacksaw	
Pressing a push to make switch	

LIST:

- A Linear
- B Rotary
- C Reciprocating
- D Oscillating

[4]

- (b) **Fig. 1** shows a lever that is used to operate a foot brake.

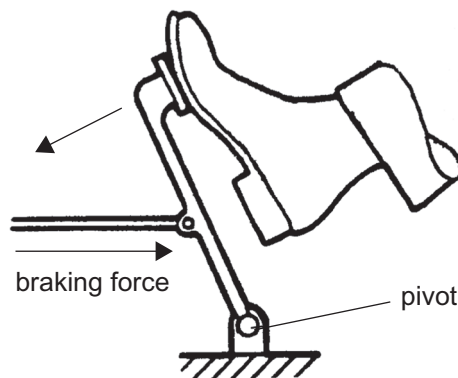


Fig. 1

- (i) What is the class of lever shown in the diagram?

_____ [1]

- (ii) How could the design in **Fig. 1** be changed to give a greater braking force?

 _____ [2]

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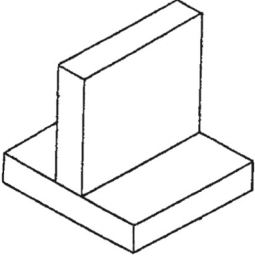
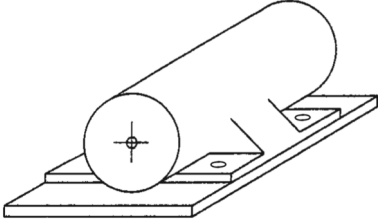
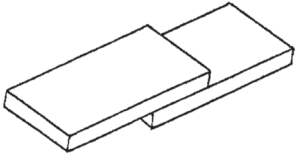
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Total Question 3

4 Table 3 shows three examples of parts to be joined.

- (i) Complete Table 3. Write down an appropriate method for joining in each case.
- (ii) Show in the column if the method is permanent or semi-permanent.

Table 3

Example	Method	Permanent or Semi-permanent
 <p>Steel plates</p>		
 <p>Electric Motor to a Steel Plate</p>		
 <p>Acrylic strips</p>		

[6]

Examiner Only	
Marks	Remark
Total Question 4	

[Turn over

- 6 Fig. 3 shows a pneumatic circuit that is used to clamp parts on a machine table. The clamps are to be applied at the same time.

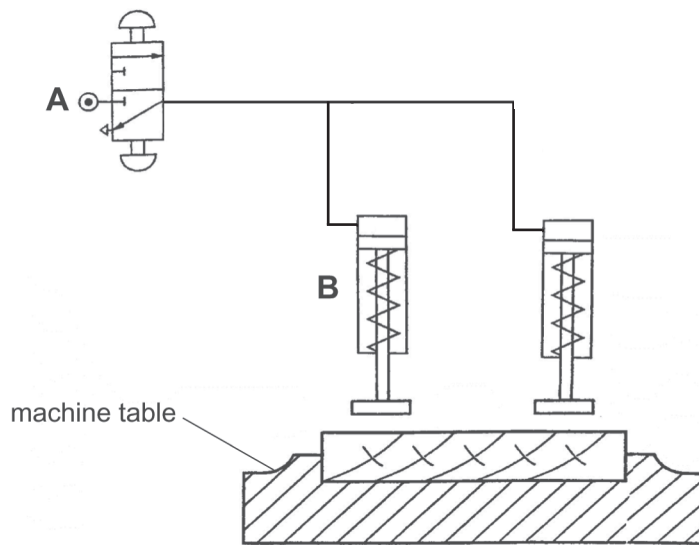


Fig. 3

- (a) (i) What are the names of the components **A** and **B**?

A _____

B _____ [2]

- (ii) Explain how the circuit operates.

_____ [2]

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Marks	Remark

(c) (i) Write down the type of circuit shown in Fig. 6.

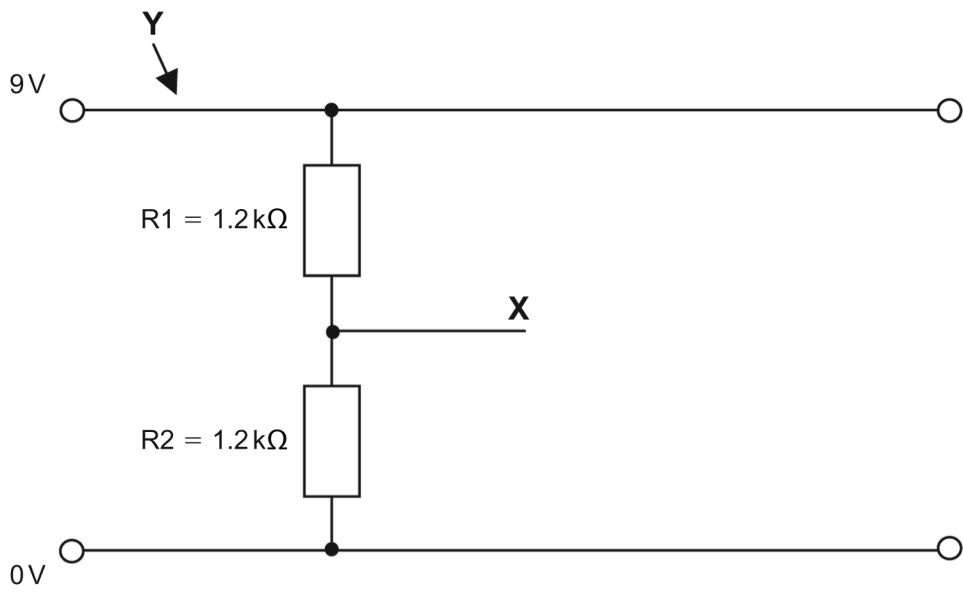


Fig. 6

(ii) What is the expected voltage output at X if each resistor in Fig. 6 has a value of 1.2 kΩ?

_____ [1]

(iii) A SPST switch is to be added at point Y in Fig. 6.

Use the space below to draw a sketch of the symbol for a SPST switch.

[1]

(iv) What does the abbreviation SPST stand for?

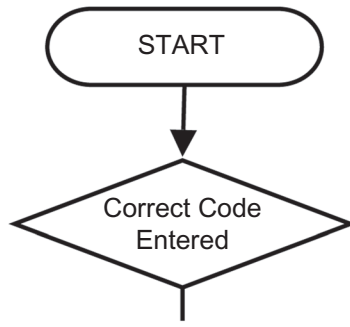
_____ [1]

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Marks Remark

Total Question 8

[Turn over



Examiner Only

Marks	Remark
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Total Question 9	
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[11]

[Turn over

8115.03 ML

(ii) What is **one** disadvantage of using stainless steel and not mild steel?

[1]

(c) The stand holds five bicycles. When all five bicycles are parked, two bicycles are supported at a different level than the other three.

Why do you think this feature was in the design?

[2]

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Marks	Remark
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Total Question 10

[Turn over



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Question Number	Marks
1	
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11	

Total Marks	
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Examiner Number

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