

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCSE

**Design and Technology:
Resistant Materials Technology
Unit 2: Knowledge and Understanding of
Resistant Materials Technology**

Wednesday 25 May 2011 – Afternoon
Time: 1 hour 30 minutes

Paper Reference

5RM02/01

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches it must be dark (HB or B). Coloured pens, pencils and highlighter pens must **not** be used.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
– *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Answer ALL the questions.

For each question 1 to 10, choose an answer A, B, C or D. Put a cross in the box indicating the answer you have chosen . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

1 For which **one** of the following is a scribe used?

- A Measuring
- B Making holes
- C Marking out
- D Removing waste

(Total for Question 1 = 1 mark)

2 Which **one** of the following is most suitable for joining two pieces of pine together?

- A Contact adhesive
- B Epoxy resin
- C Tensol[®] cement
- D PVA

(Total for Question 2 = 1 mark)

3 Which **one** of the following is a wasting process?

- A Turning
- B Vacuum forming
- C Casting
- D Blow moulding

(Total for Question 3 = 1 mark)



4 Which **one** of the following is an alloy?

- A Copper
- B Zinc
- C Aluminium
- D Brass

(Total for Question 4 = 1 mark)

5 Which **one** of the following processes is most suitable for producing long lengths of plastic guttering?

- A Laminating
- B Extrusion
- C Casting
- D Vacuum forming

(Total for Question 5 = 1 mark)

6 Which **one** of the following statements about plywood is true?

- A It has an odd number of layers
- B The outside layers run in opposite directions
- C It has an even number of layers
- D It is a natural timber

(Total for Question 6 = 1 mark)

7 Which **one** of the following tools is used for producing lines parallel to an edge?

- A Try square
- B Engineer square
- C Marking gauge
- D Centre punch

(Total for Question 7 = 1 mark)



8 Which **one** of the following is a thermosetting plastic?

- A Acrylic
- B Polyethene
- C Polyvinyl chloride
- D Urea formaldehyde

(Total for Question 8 = 1 mark)

9 A screw thread is described as M6 x 1.0

What does the M stand for?

- A Metric
- B Millimetres
- C Metres
- D Measurement

(Total for Question 9 = 1 mark)

10 Tempering is a heat treatment process.

Which **one** of the following is the purpose of tempering?

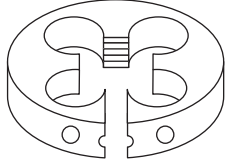
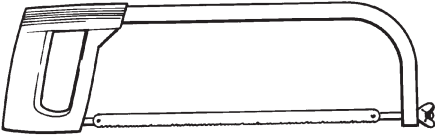
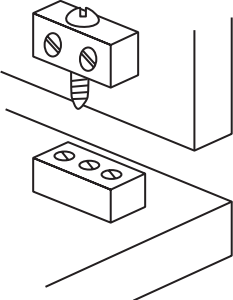
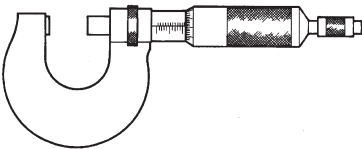
- A It increases the hardness of the metal
- B It removes the brittleness of the metal once hardened
- C It increases carbon content
- D It makes the outside surface harder

(Total for Question 10 = 1 mark)



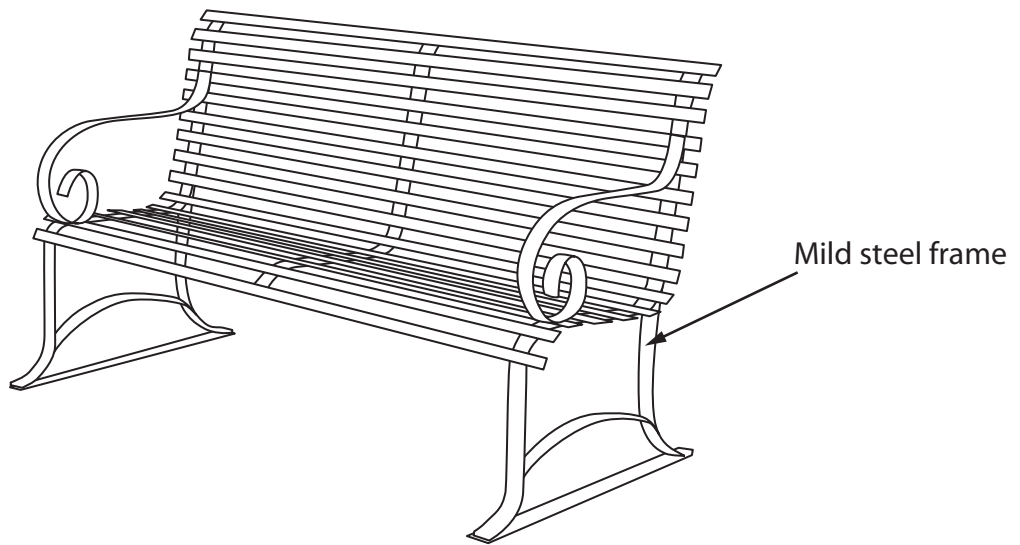
11 (a) The table below shows some tools and components.

Complete the table below by giving the missing names and uses.

Tool/Component	Name	Use
	Die	(1)
	Hacksaw	(1)
		Joining flat sheets of material together to make furniture (1)
		Making very accurate measurements (1)



(b) The drawing below shows a garden bench.



(i) Give **two** properties of mild steel that make it suitable for the frame. (2)

1

2

(ii) Give **two** reasons for applying a surface finish to the mild steel frame. (2)

1

2

(iii) Name **three** finishes that could be applied to the mild steel frame. (3)

1

2

3



(iv) The frame could be manufactured from aluminium.

Explain **two** advantages of making the frame from mild steel rather than aluminium.

(4)

1

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2

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(v) Describe **two** effects on the environment of being able to recycle mild steel.

(4)

1

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2

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(Total for Question 11 = 19 marks)



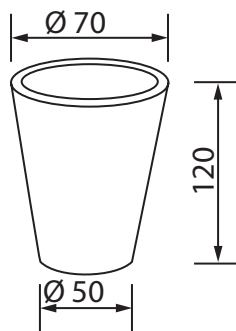
12 You have been asked to design a drink cup holder to be used by the waiters in a fast food restaurant.

The specification for the drink cup holder is that it must:

- hold four drink cups
- stop the cups from falling over as they are carried
- be easy to carry
- be easy to remove the cups from the holder
- be easily wiped clean
- stack when not being used
- be made from materials available in a school workshop
- be manufactured using processes available in a school workshop.

Additional information

Details of a drink cup:



All dimensions in mm

In the spaces opposite, use sketches and, where appropriate, brief notes to show **two different** design ideas for the drink cup holder that meet the specification points above.

Candidates are reminded that if a pencil is used for the diagrams/sketches it must be dark (HB or B).

Coloured pens, pencils and highlighter pens must **not** be used.

PLEASE DO NOT WRITE OR DRAW IN THIS SPACE.

PLEASE USE THE SPACES OPPOSITE FOR YOUR DESIGNS.



Design idea 1

(8)

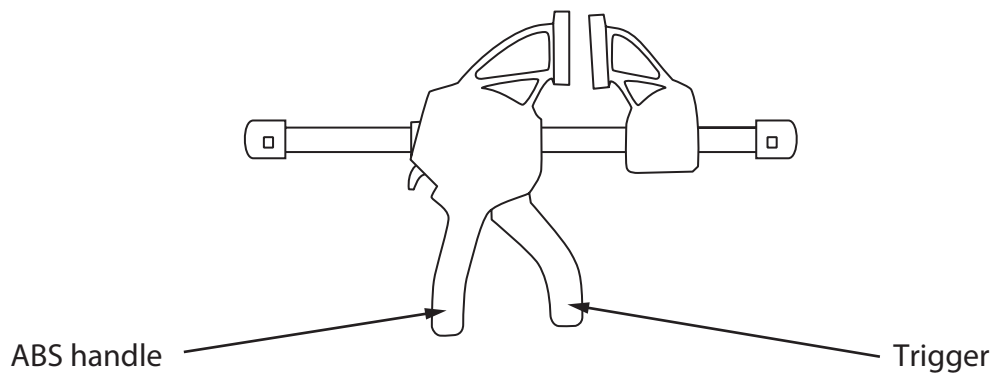
Design idea 2

(8)

(Total for Question 12 = 16 marks)



13 The drawing below shows a workshop cramp.



(a) Give **two** properties of ABS which make it suitable for the handle.

(2)

1

2

(b) The trigger of the workshop cramp is manufactured in ABS.

Describe **two** reasons why injection moulding is a suitable process to manufacture the trigger.

(4)

1

2



(c) Explain why the workshop cramp is successful in meeting the following specification points:

(i) can be used with one hand.

(2)

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(ii) easy to apply a large force.

(2)

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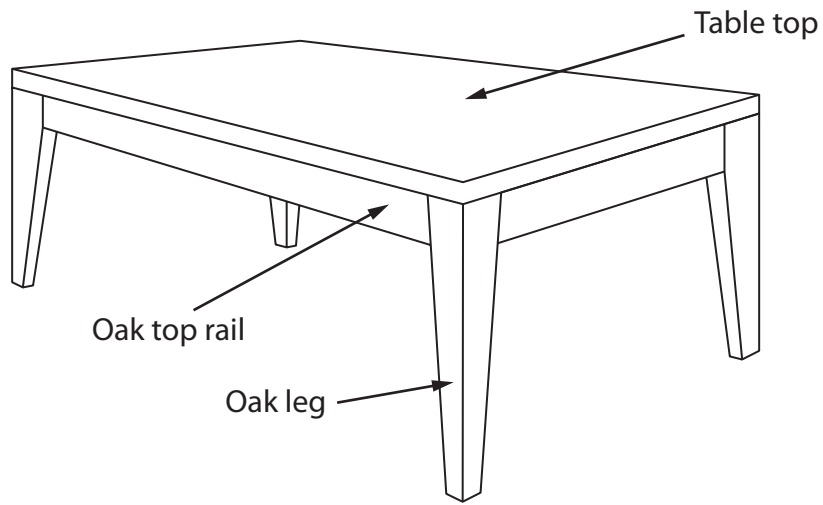
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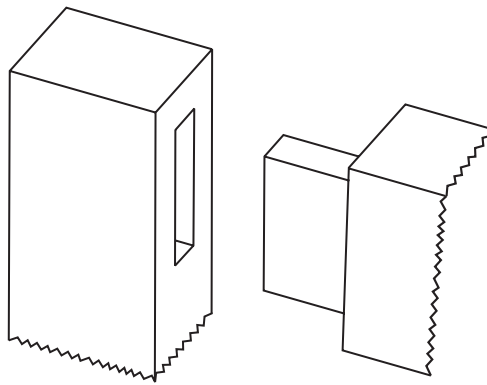
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14 The picture below shows a dining room table.



The legs are joined to the top rail using the joint shown below.



(a) Name this type of joint.

(1)



(b) Give **two** properties of oak that make it suitable for making the legs of the table.

For each property, justify your answer.

(4)

Property 1

Justification

Property 2

Justification

(c) A thin layer of oak is glued to a sheet of MDF to make the table top.

Describe **two** reasons why this is used rather than solid oak for the table top.

(4)

1

2



(d) The designers and manufacturers are able to have a discussion about the table using a videoconference.

Describe **two** advantages of having the discussion by videoconference.

(4)

1

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2

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