Please write clearly in block capitals.

Surname _____

Forename(s) _____

Candidate signature _____

GCSE

DESIGN AND TECHNOLOGY:

Year 10 Rehearsal - Written Paper

February 2020 Time allowed: 1 hour

Materials
For this paper you must have:
- a black pen
- a pencil
- a ruler maintenance
- an eraser
- a pencil sharpener
- coloured pencils.

Instructions
- Use black ink or black ball-point pen. Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in the answer book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 100.
- All dimensions are given in millimetres unless otherwise stated.
- You are reminded of the need for good English and clear presentation in your answers.

1 (a) Which of the following properties correctly describes the properties of a material having **fusibility**.

The material is extremely flammable and has to be kept in specially designed storage containers. ☐

The material is not flammable and can be used around areas where open flames are present. ☐

The material can be converted into a liquid using heat and combined with another material before cooling as one material. ☐

The material will never be converted into a liquid once it has been set. ☐

[1 mark]

1 (b) Which of the following properties correctly describe the properties of a material having **elasticity.**

The material is extremely flammable and has to be kept in specially design storage containers. ☐

The material will stretch into a thin band. ☐

The material will return to its original shape after being compressed or stretched. ☐

The material can never be used to tie knots unless heated to a certain temperature. ☐

[1 mark]

2 (a) Using the following **properties;**

conductivity, density, malleability, absorbency, toughness, compressive strength, hardness.

For each of the following statements; write which **property** the statement is describing.

[7 marks]

This is when a material will take on an element such as liquid, light and heat.

_____

This is the mass of the material; per unit of volume which determines how compact a material is.

_____

The ability to conduct electricity or heat.

_____

The ability to resist abrasive wear and not scratch easily.

_____

The ability of a material to withstand force such as pressure or heavy weight.

_____

The ability to absorb energy through shock without breaking.

_____

The ability to deform under pressure without cracking or tearing.

_____

2 (bi) Name a product which would require both heat conductivity and hardness.

_____

2 (bii) Name a product which would require both compressive strength and density.

_____ **[2 marks]**

3 (a) Explain why Engineering companies buy **components** from external suppliers rather than manufacturing their own. **[3 marks]**

_____

_____

_____

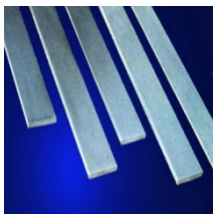
3 (b) Complete the table;

[6 marks]

Component Name	**Picture**	**Use**
_____		_____ _____
_____		_____ _____
_____		_____ _____

4 (a) For each picture; name the **stock form**.

[6 marks]



_____

_____

_____

_____

_____

_____

4 (b) Name the three **groups** of metal. Identify a specific metal which would fit into this group.

[3 marks]

1. Group Name _____ Metal Example _____
2. Group Name _____ Metal Example _____
3. Group Name _____ Metal Example _____

4 (c) Discuss how **sustainable** the use of metal is in manufacturing.

[3 marks]

_____

_____

_____

_____

5 (ai) The workshop stool legs and frame are made from mild steel. Explain why the properties of mild steel are suitable for this stool.

[4 marks]

5 (aii) Describe how the steel could be finished to prevent rusting.

[2 marks]

5 (bi) The casing for this mobile phone is made from aluminum. Explain why the properties of aluminum are suitable for this mobile phone.

[4 marks]

5 (bii) How would the aluminum be finished?

[2 marks]

6 Before designing a product Engineers will conduct **research.** Research will help them find out what they need to know about the product before they design it.

6 (a) What is the difference between Primary and Secondary research?

[2 marks]

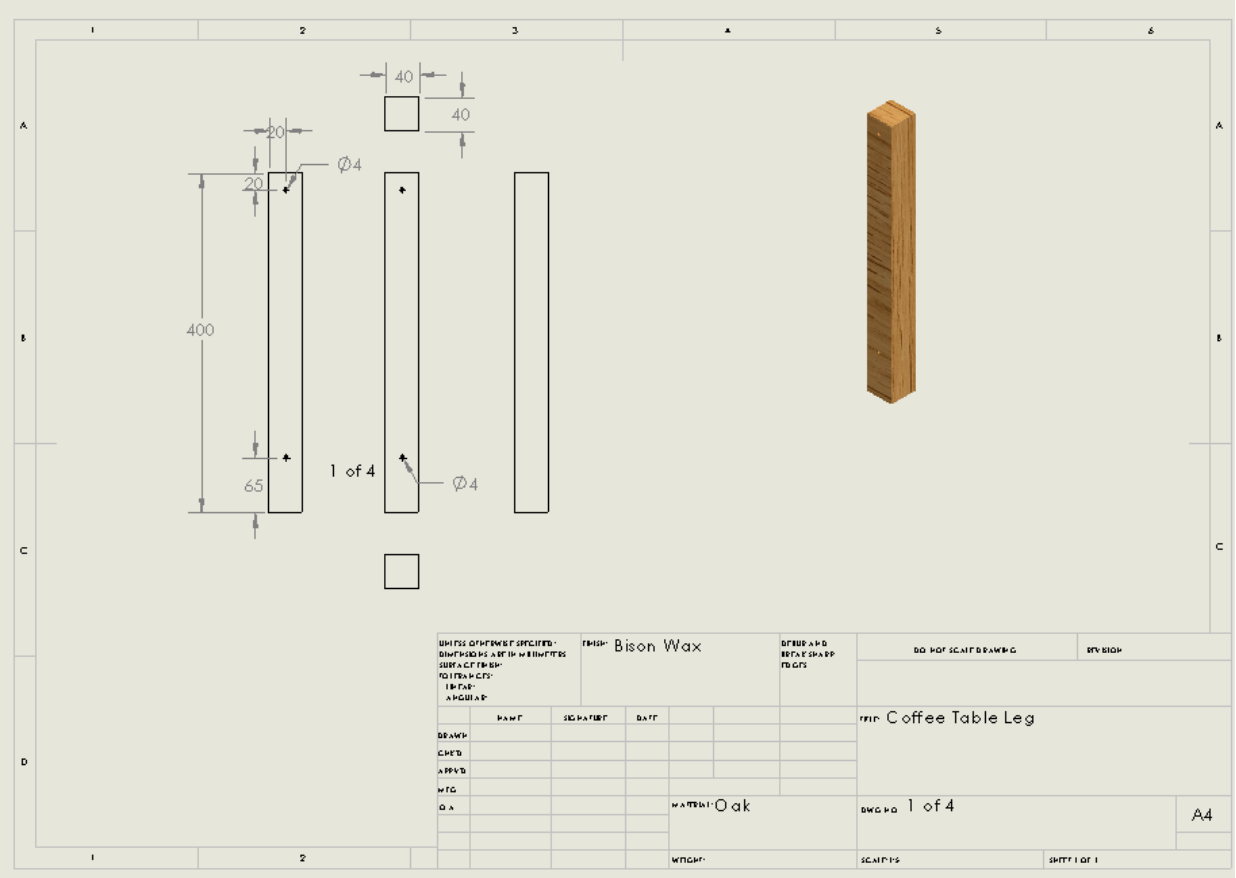
6 (b) An Engineer is designing a chair. Describe what **secondary** research they could do to help them find out what **height** to make the chair.

[2 marks]

6 (c) Describe what **primary** research they could do to help them find out what **height** to make the chair.

[2 marks]

7 An Engineering company is going to batch produce 2500 of these coffee tables. The drawing below shows one of the legs that needs to be made.



7 (ai) How many legs are going to be needed to be manufactured for the whole batch?

[1 mark]

7 (aii) Name the material the legs are made out of.

[1 mark]

7 (aiii) Why is this material suitable for the legs?

[2 marks]

7 (b) To make one leg, what size material would you order?

[1 mark]

---

7 (c) Each leg has four drilled holes. What is the diameter of these holes?

[1 mark]

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7 (d) What is the function of these holes?

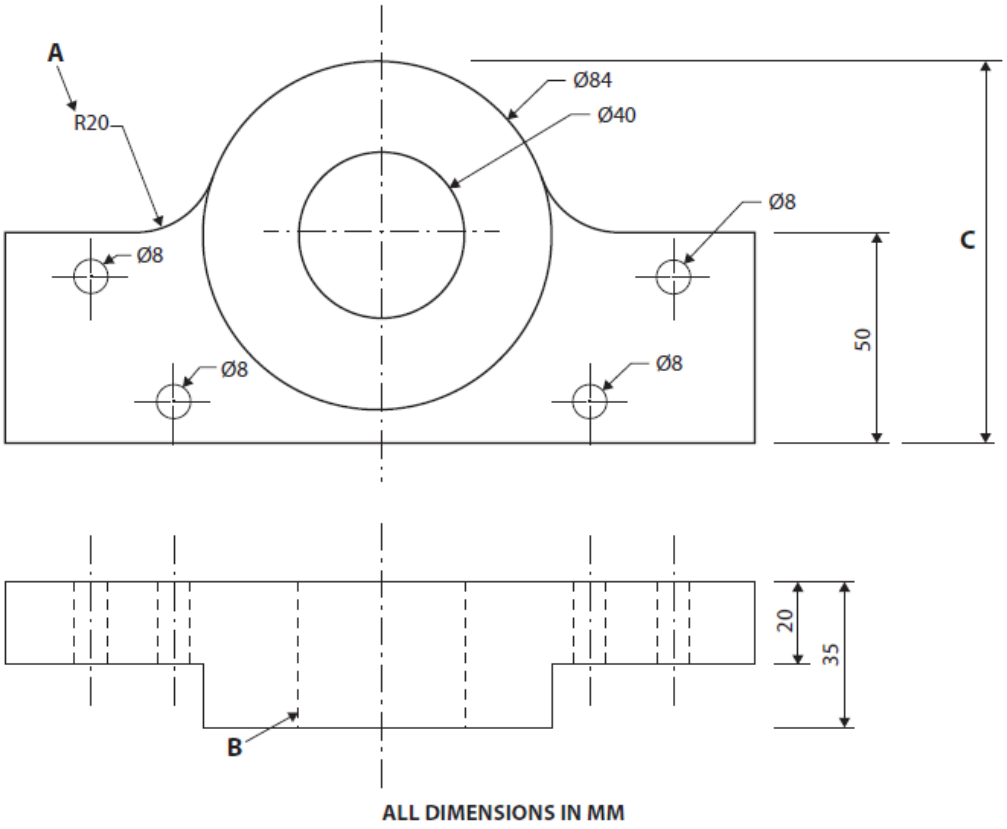
[1 mark]

---

7 (e) The coffee tables are going to be manufactured using **batch production** (2500). With the use of notes and diagrams show an efficient way of **marking out** each leg.

[8 marks]

8 Engineering drawings are used by engineers to show the features of components.



8 (a) State the meaning of the abbreviation R indicted by the letter A.

_____

[1 mark]

8 (b) Engineers add dimensions to drawings so components can be made. Calculate the overall dimension indicated by the letter C. Show your working out.

[2 marks]

9 (a) Explain the difference between Hardwoods and Softwoods.

[3 marks]

9 (b) Name two hardwoods, two softwoods and two manufactured boards.

[6 marks]

Hardwoods	**Softwoods**	**Manufactured Boards**

[6 marks]

9 (c) Explain the benefits of using manufactured boards instead of natural timber.

[4 marks]

10a Using the following types of **paper and boards;**

Bleed proof paper, ink jet card, foil lined card, layout paper, cartridge paper, grid paper, corrugated cardboard.

For each of the following descriptions; write which paper or board it is describing.

[7 marks]

Stops marker pens staining through the page so deeper colours can be achieved.

_____

Completely opaque and more expensive than photocopier paper. Takes colour extremely well.

_____

Faint lines of light blue ink. Can buy darker versions to go under paper.

_____

Translucent, takes pencil and colours well.

_____

Strong, hardwearing and lightweight, with corrugations to improve overall strength. Easy to print on and recycle.

_____

Foil reflects heat and makes it water and oil resistant.

_____

Card treated to hold high quality photo finish, Ink dries on surface to create deeper colors.

_____

(10bi) Suggest a type of board that the box is made form. **[1 mark]**

_____

(10bii) Give a reason for your answer to part **(10bi).**

_____

_____

_____

[3 marks]

END OF QUESTIONS