



Oxford Cambridge and RSA

**Friday 15 October 2021 – Morning**

**A Level in Design and Technology:  
Product Design**

**H406/02 Problem Solving in Product Design**

**Time allowed: 1 hour 45 minutes**



**You must have:**

- the Resource Booklet

**You can use:**

- a ruler (cm/mm)
- a scientific calculator
- geometrical instruments



Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

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Candidate number

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First name(s)

\_\_\_\_\_

Last name

\_\_\_\_\_

**INSTRUCTIONS**

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.
- Each question tells you which part of the Resource Booklet to refer to.

**INFORMATION**

- The total mark for this paper is **70**.
- The marks for each question are shown in brackets [ ].
- Quality of extended response will be assessed in questions marked with an asterisk (\*).
- This document has **16** pages.

**ADVICE**

- Read each question carefully before you start your answer.



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- 4 The manufacturer, Apple Blossom, is considering the feasibility of making 'Kwik slot' garden planters from 'Medite Tricoya Extreme' (MTX).

Refer to **Fig. 7** of the Resource Booklet.

Calculate the percentage waste of material from one Kwik slot garden planter side panel. Show your working.

Refer to information on **page 6** of the Resource Booklet.

Waste material ..... %



5 Apple Blossom is keen to bring the Kwik slot range of outdoor garden furniture to market.

The designers need to carry out quality assurance on the prototype furniture.

Products such as the chair in **Fig. 8** undergo testing in order to check that they meet the technical specification and British Standards.

Use sketches and/or notes to outline suitable methods of testing the chair in **Fig. 8**.

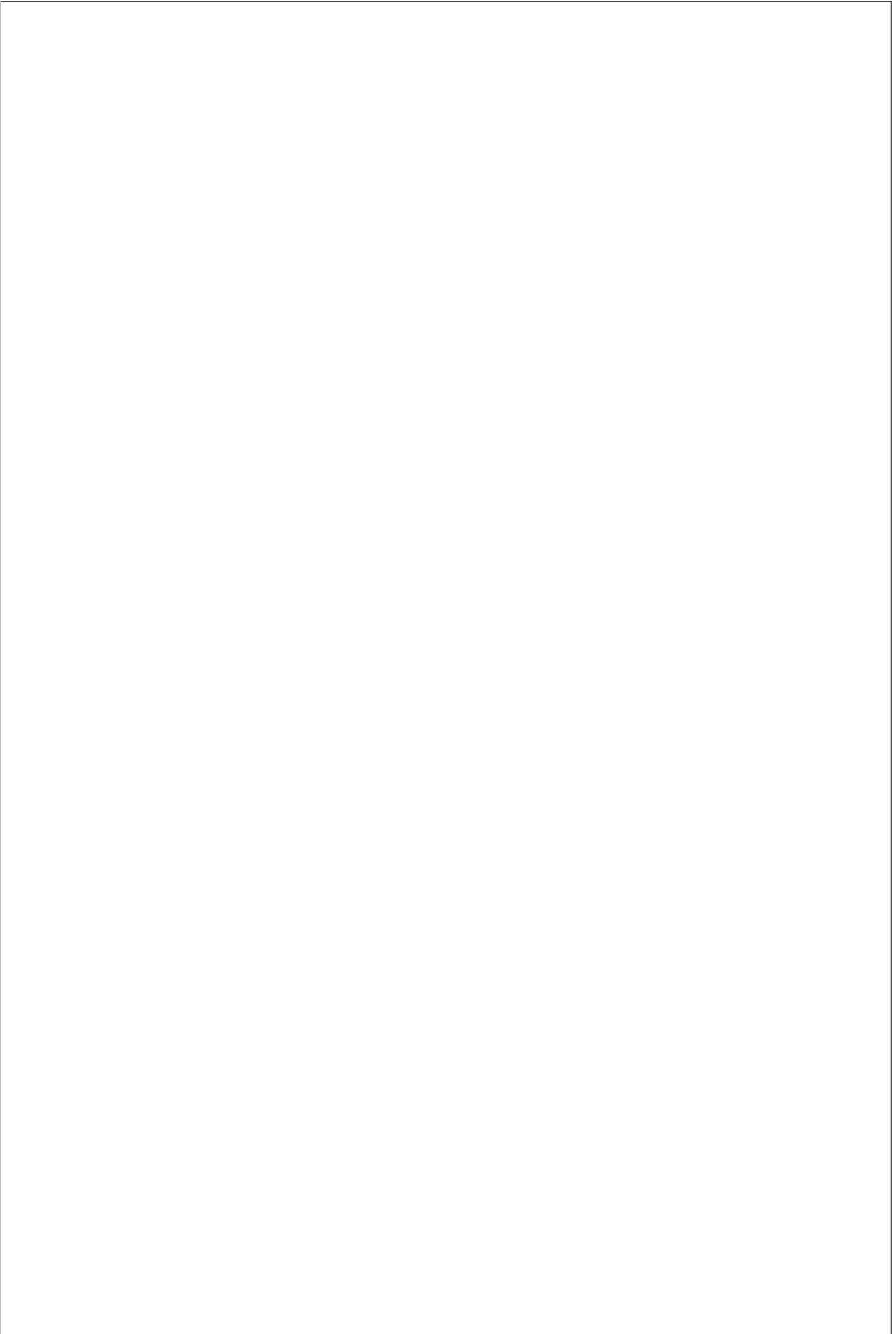
Your answer **must** include testing for the following:

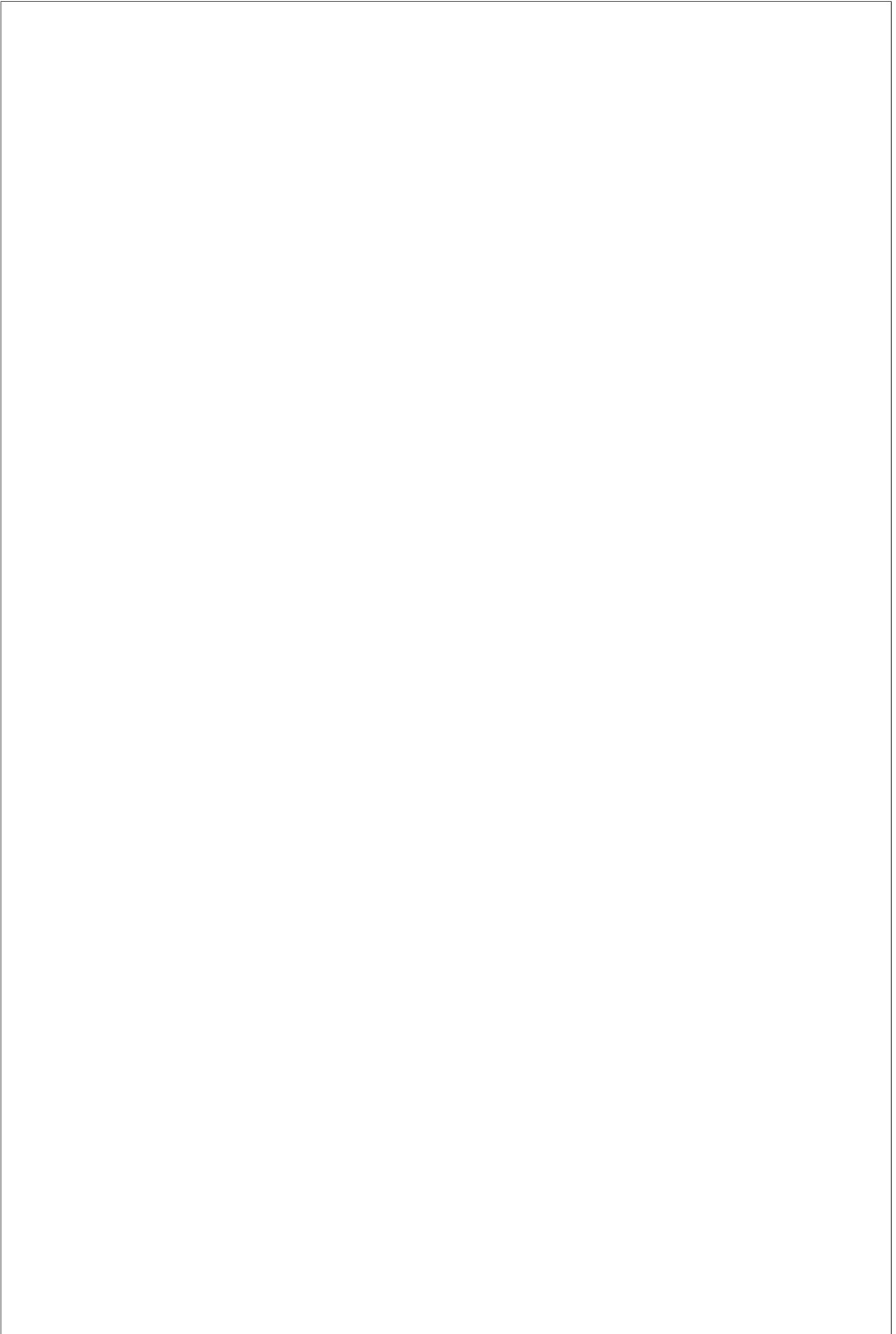
- accuracy
- appearance
- functionality.

Refer to information on **page 7** of the Resource Booklet.

[12]







- 6 The manufacturer requires the chair design to be optimised for flat packing in order to lower transportation and storage costs.

An initial batch of 500 chairs will be made.

Use sketches and/or notes to show how the design of the chair in **Fig. 8** and **Fig. 9** could be modified for manufacture and assembly (DFMA).

Your answer **must** identify features that would:

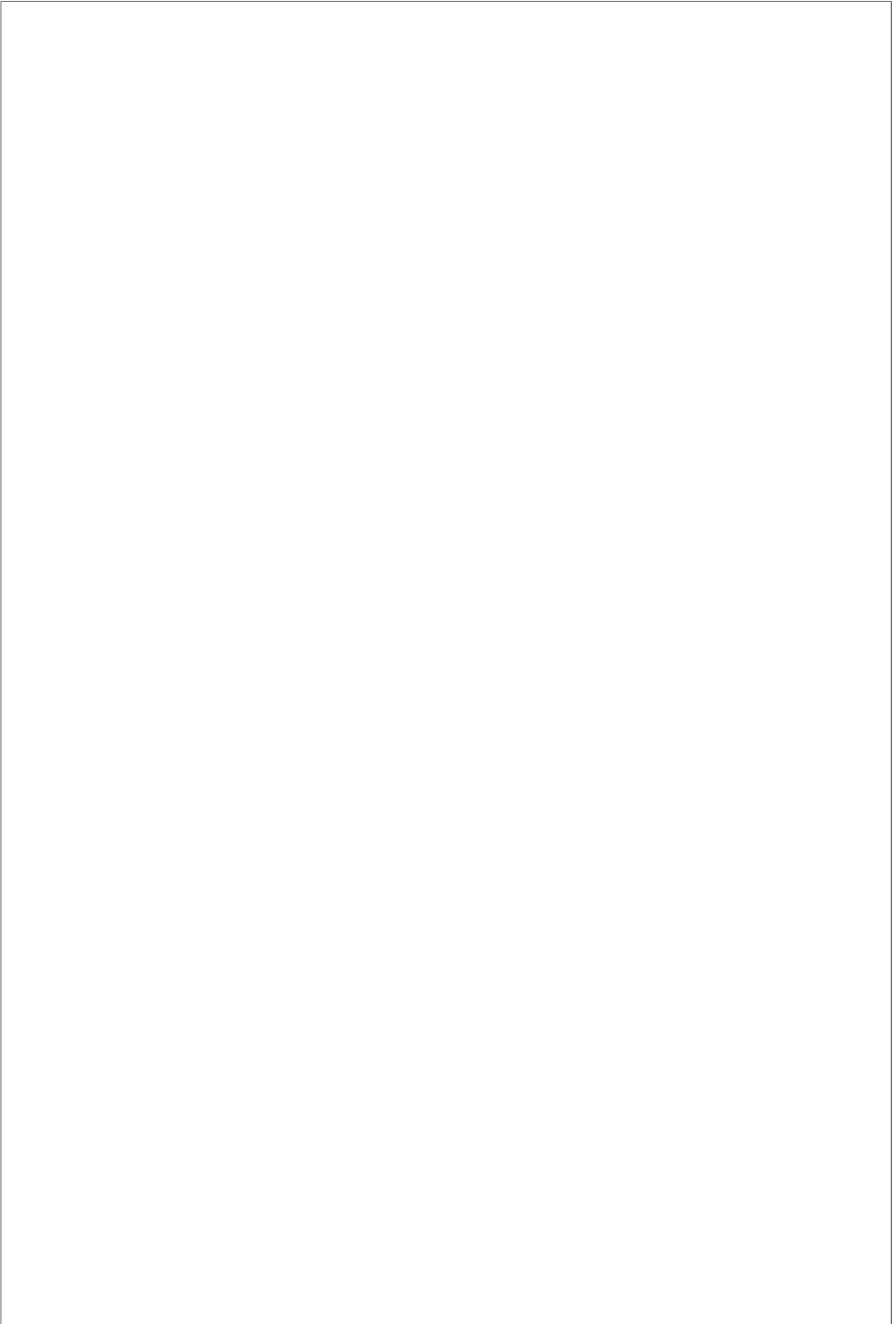
- minimise additional fixings
- simplify assembly
- provide structural integrity
- minimise waste material through tessellation.

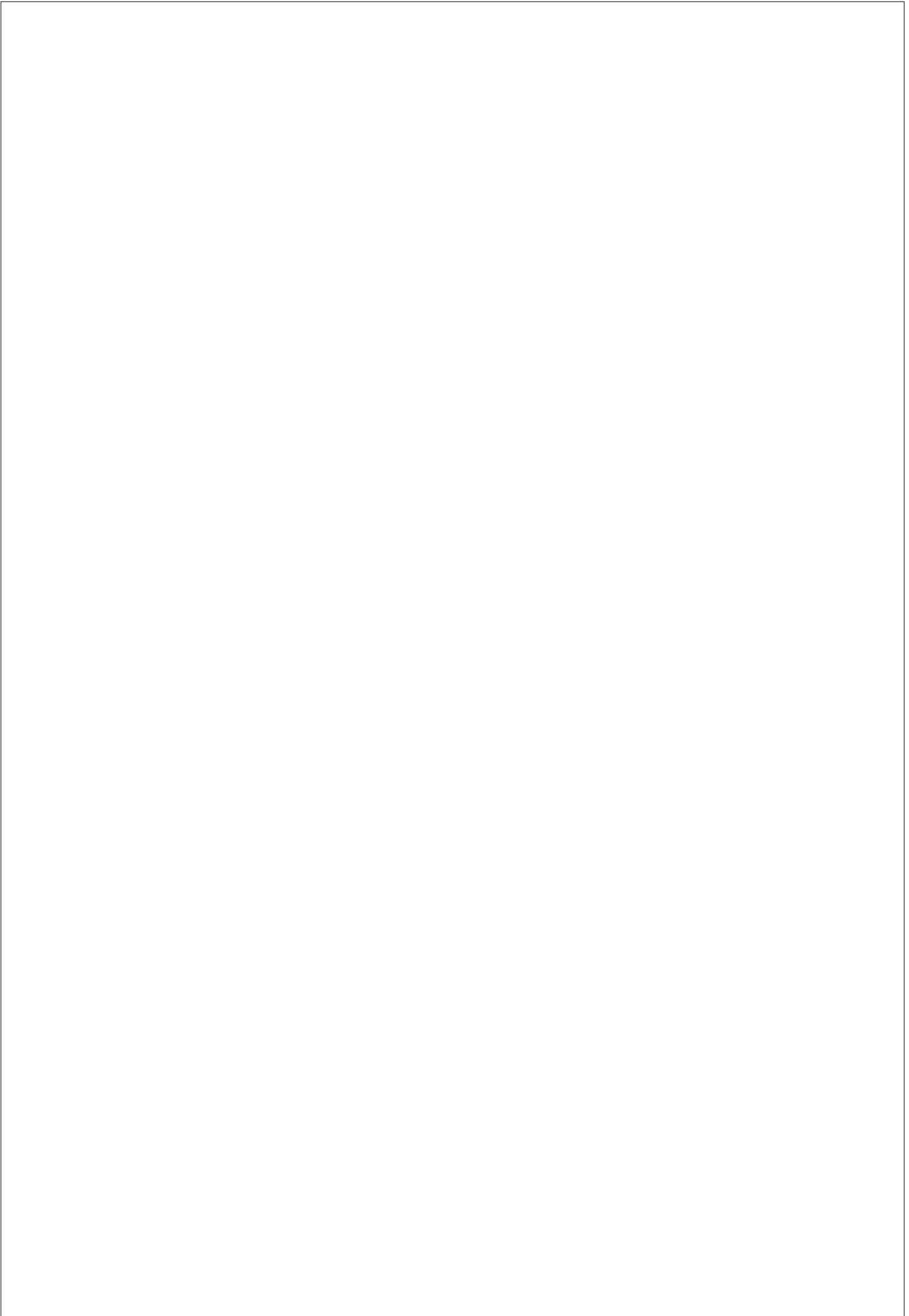
**In your answer you must provide details of the modifications necessary to make the product with an industrial CNC router. The end-user should be able to assemble the chair with little prior practical experience.**

Refer to information on **pages 7 and 8** of the Resource Booklet.

**[20]**







**END OF QUESTION PAPER**

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