



**Surname** \_\_\_\_\_

**Other Names** \_\_\_\_\_

**Centre Number** \_\_\_\_\_

**Candidate Number** \_\_\_\_\_

**Candidate Signature** \_\_\_\_\_

**I declare this is my own work.**

**GCSE**

**DESIGN AND TECHNOLOGY**

**Unit 1 Written Paper**

**8552/W**

**Friday 22 May 2020**

**Afternoon**

**Time allowed: 2 hours**

**At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.**

**[Turn over]**



**For this paper you must have:**

- **normal writing and drawing instruments**
- **a calculator**
- **a protractor.**

## **INSTRUCTIONS**

- **Use black ink or black ball-point pen. Use pencils only for drawing.**
- **Answer ALL questions.**
- **You must answer the questions in the spaces provided. Do not write on blank pages.**
- **If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).**
- **Do all rough work in this book. Cross through any work you do not want to be marked.**



## **INFORMATION**

- **All dimensions are in millimetres.**
- **The marks for questions are shown in brackets.**
- **The maximum mark for this paper is 100.**
- **There are 20 marks for Section A, 30 marks for Section B and 50 marks for Section C.**

**DO NOT TURN OVER UNTIL TOLD TO DO SO**



**SECTION A – Core technical principles**

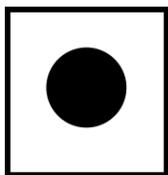
**Answer ALL questions in this section.**

**Each of Questions 01 to 10 is followed by four responses, A, B, C and D.**

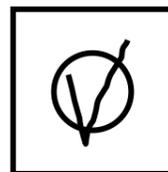
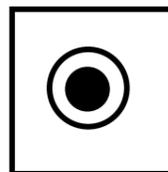
**For each question completely fill in the circle alongside the appropriate answer.**



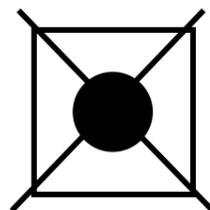
**CORRECT METHOD**



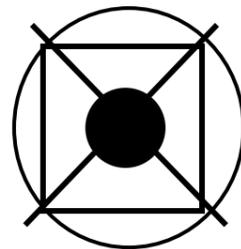
**WRONG METHODS**



**If you want to change your answer you must cross out your original answer as shown.**



**If you wish to return to an answer previously crossed out, ring the answer you now wish to select as shown.**



**[Turn over]**



0	1
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**Which type of renewable energy is sourced from plants? [1 mark]**

**A Biomass**

**B Solar**

**C Tidal**

**D Wind**



0	2
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**Planned obsolescence is when a product is designed [1 mark]**

**A to be repairable.**

**B to have a short lifespan.**

**C to have replaceable sections.**

**D to take upgrades.**

**[Turn over]**



0	3
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**What is the electrical component shown in FIGURE 1 used for? [1 mark]**

**FIGURE 1**



- A To detect pressure levels**
- B To detect temperature levels**
- C To switch equipment on or off**
- D To switch the direction of a motor**

**[Turn over]**



0	4
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**Identify the smart material used to darken windows in bright sunlight. [1 mark]**

**A Aluminium foam**

**B Photochromic pigment**

**C Shape memory alloy**

**D Thermochromic pigment**



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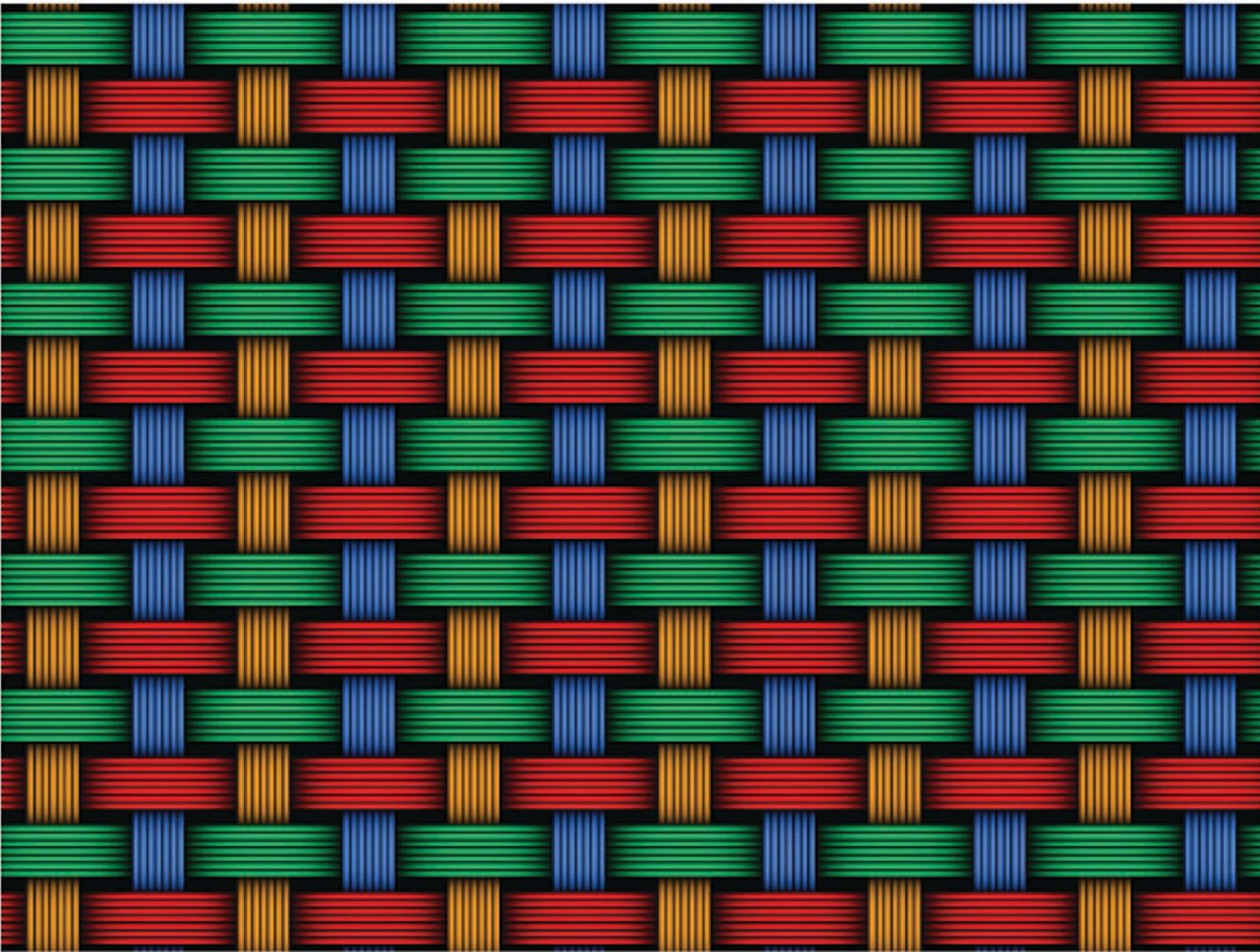
**[Turn over]**

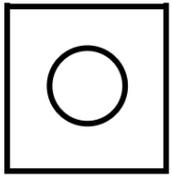


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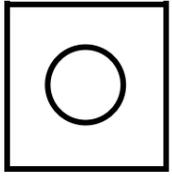
**Identify the textile fabric shown in  
FIGURE 2. [1 mark]**

**FIGURE 2**

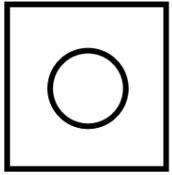




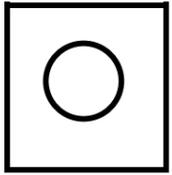
**A Bonded fabric**



**B Felted fabric**



**C Knitted fabric**



**D Woven fabric**

**[Turn over]**



0	6
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**‘Technology push’ describes when products are developed [1 mark]**

- A** due to improvements in new materials.
- B** due to increased consumer demand.
- C** in response to consumer feedback.
- D** with the user in mind.



0	7
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**Which ONE of the following statements about industry is true? [1 mark]**

- A An increased use of robotics has led to a reduction in manual jobs.**
- B An increased use of robotics means more people need to be employed.**
- C The latest production lines require more people who can use hand tools skilfully.**
- D The use of CAD and CAM in industry has led to less efficiency.**

**[Turn over]**



0	8
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**Which of the following is part of a kinetic pumped storage system? [1 mark]**

**A Alkaline battery**

**B Oil field**

**C Photovoltaic cell**

**D Turbine**



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**[Turn over]**



09

Name the identified component shown in FIGURE 3. [1 mark]

FIGURE 3



A Cam

B Gear

C Lever

D Pulley

1	0
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**A ductile material is commonly described as one that [1 mark]**

**A can be drawn into a long length.**

**B does not scratch easily.**

**C resists corrosion and oxidisation.**

**D shatters under a sudden impact.**

**[Turn over]**



11.1

**Name ONE alloy. [1 mark]**

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11.2

**Explain why metals are alloyed. [2 marks]**

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**[Turn over]**



**12.1**

**Composite materials such as foil and polymer lined boards are used in food and drink packaging.**



**Give ONE advantage and ONE disadvantage of using composite materials for packaging. [2 marks]**

**Advantage** \_\_\_\_\_

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**Disadvantage** \_\_\_\_\_

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**[Turn over]**



**12.2**

**TABLE 1 shows the number of food and drink containers successfully recycled by a manufacturer in 2010 and 2017.**

**TABLE 1**

<b>Recycling of composite food and drink containers</b>	
<b>2010</b>	<b>2017</b>
<b>32 billion tonnes</b>	<b>46 billion tonnes</b>



**What is the percentage increase in recycling of composite food and drink containers between 2010 and 2017?  
[2 marks]**

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**Answer** \_\_\_\_\_

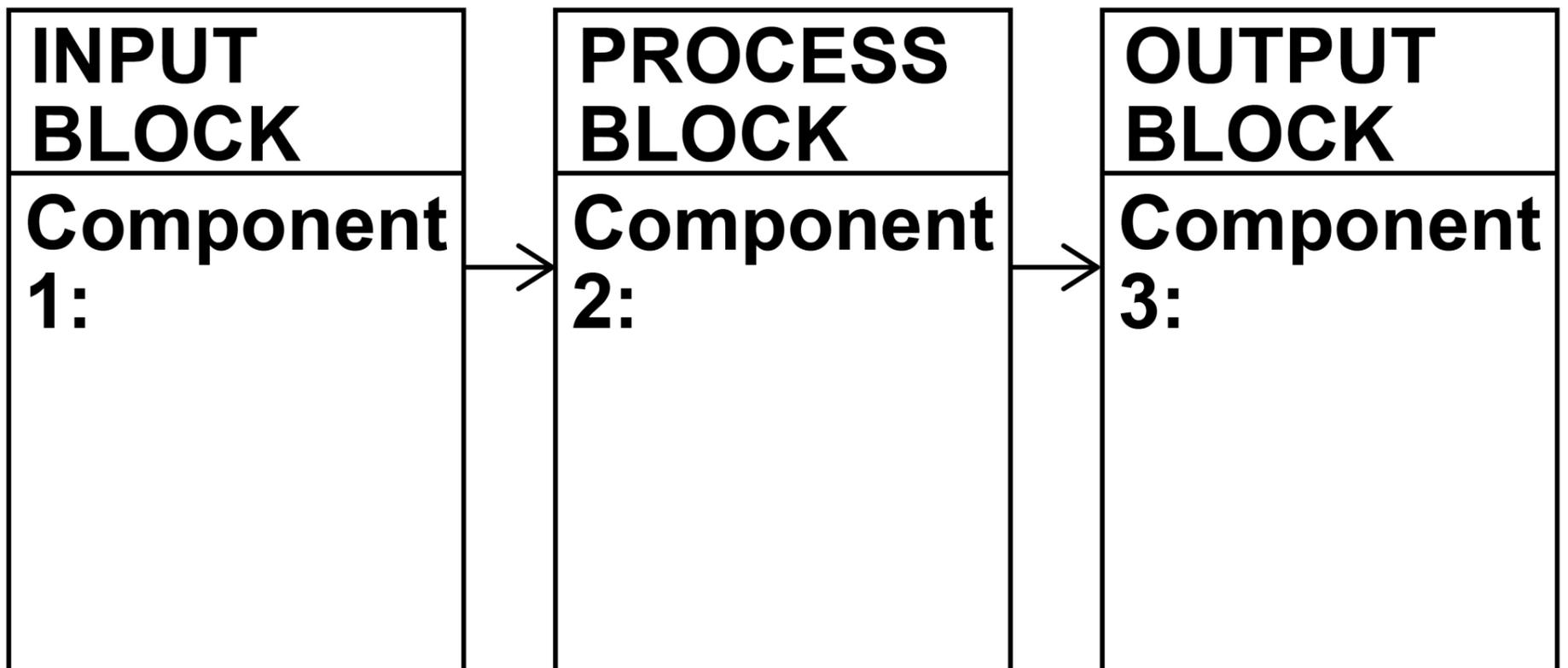
**[Turn over]**

1	3
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**FIGURE 4** shows a system diagram for an alarm.

Complete the diagram by naming **ONE** component that could be used in **EACH** block. [3 marks]

**FIGURE 4**



20



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**[Turn over]**



**SECTION B – Specialist technical principles**

**Answer ALL questions in this section.**

**1 | 4**

**Name ONE specific commercial manufacturing process and describe what it is used for.**

**Name of process** \_\_\_\_\_  
\_\_\_\_\_

**On the opposite page, using notes and/or sketches describe the process you have named above. [4 marks]**

**[Turn over]**



1 5

**Explain why EACH factor below would need to be considered by a manufacturer when sourcing materials/components.**

**[2 x 2 marks]**

**Bulk buying**

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**Ethical factors**

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**[Turn over]**



16.1

The products/components shown below are manufactured from different materials.



**Metal can opener**



**Card shoe box**



**Textile shopping bag with logo**



**Wooden toy**



**Polymer gears**



**Choose ONE product/component and complete TABLE 2.  
[3 marks]**

**My chosen product/component is \_\_\_\_\_**

**TABLE 2**

<b>Specific main material</b>	<b>Stock form used in manufacture</b>	<b>Appropriate finishing technique</b>

**33**

**[Turn over]**



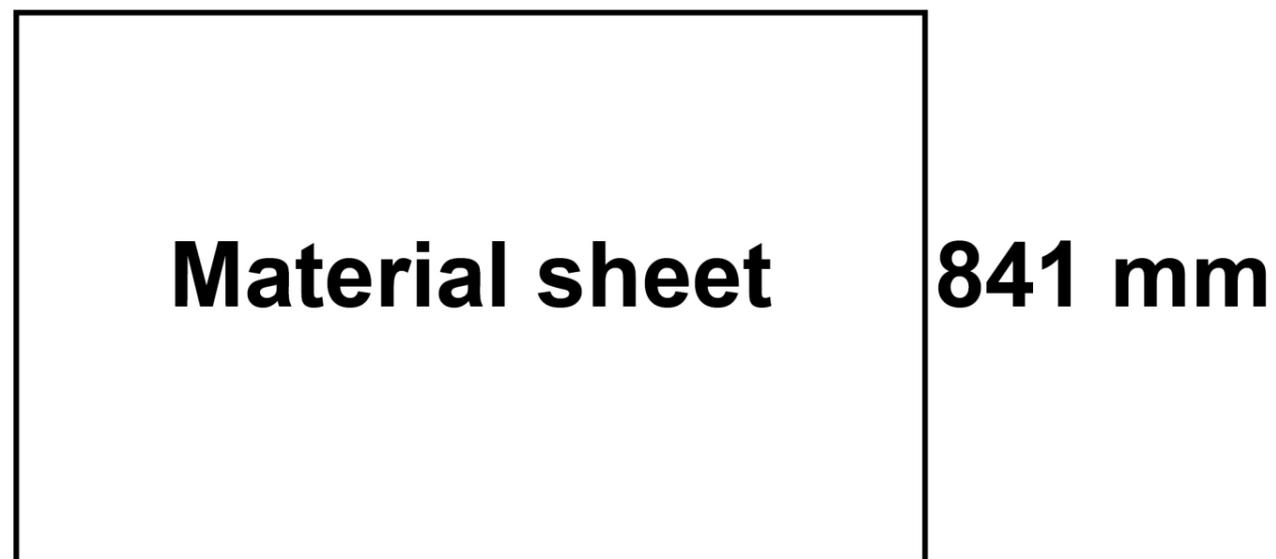
**16.2**

**A number of calendars are being made.**

**Given the sizes provided in FIGURE 5 and FIGURE 6, how many calendar pages can be made from ONE sheet?  
[2 marks]**

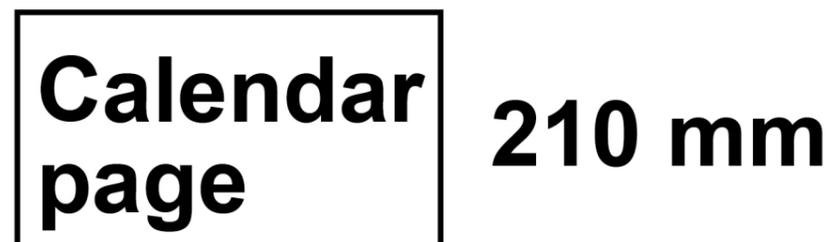
**FIGURE 5**

**1187 mm**



**FIGURE 6**

**280 mm**



**The diagrams are not drawn to scale**



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**Answer** \_\_\_\_\_

**[Turn over]**



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**16.3**

**What percentage of material is waste after cutting the pages calculated in Question 16.2?**

**Show your working and give your answer to TWO decimal places. [3 marks]**

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**37**

**Answer** \_\_\_\_\_

**[Turn over]**



17

**Responsible design should consider social issues in the design and manufacture of products.**

**Analyse and evaluate how pollution caused by the manufacture, use and disposal of products can impact the environment.**

**Give examples in your answer. [8 marks]**

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**[Turn over]**

<b>30</b>



## **SECTION C – Designing and making principles**

**Answer ALL questions in this section.**

**1 | 9**

**TABLE 3**

<b>Alessi</b>	<b>Apple</b>	<b>Braun</b>	<b>Dyson</b>
<b>Gap</b>	<b>Primark</b>	<b>Under Armour</b>	<b>Zara</b>

**Choose ONE of the companies from TABLE 3.**

**Outline the design features and/or manufacturing techniques that have made your chosen company successful.**

**You should refer to specific products in your answer. [6 marks]**







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**[Turn over]**



20

**FIGURE 7 shows THREE different kettles.**

**FIGURE 7**



**Cast iron stove kettle**



**Polymer electric kettle**



**Whistling kettle**

**Analyse and evaluate the kettles in terms of the THREE features identified on pages 50, 51 AND 52 .**

**You should not use an analysis or evaluation point more than ONCE.**

**[Turn over]**









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**[Turn over]**







**22.1**

**A designer has been asked to design a prototype toy suitable for use by a child between 3 and 5 years of age. They are using the data in TABLE 4, on the opposite page.**

**Complete the TWO missing values in TABLE 4 for popularity votes. [1 mark]**

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**TABLE 4**

<b>Type of toy</b>	<b>Popularity votes</b>	<b>Popularity votes as a percentage</b>
<b>Role play</b>	<b>65</b>	<b>26%</b>
<b>Construction</b>	<b>40</b>	<b>16%</b>
<b>Letters and numbers</b>		<b>34%</b>
<b>Jigsaws and puzzles</b>	<b>25</b>	<b>10%</b>
<b>Soft toys</b>		<b>14%</b>
<b>Total</b>	<b>250</b>	<b>100%</b>

**[Turn over]**



**22.2**

**Use your values from Question 22.1 to complete the bar chart, on the opposite page, and label the x axis. [3 marks]**



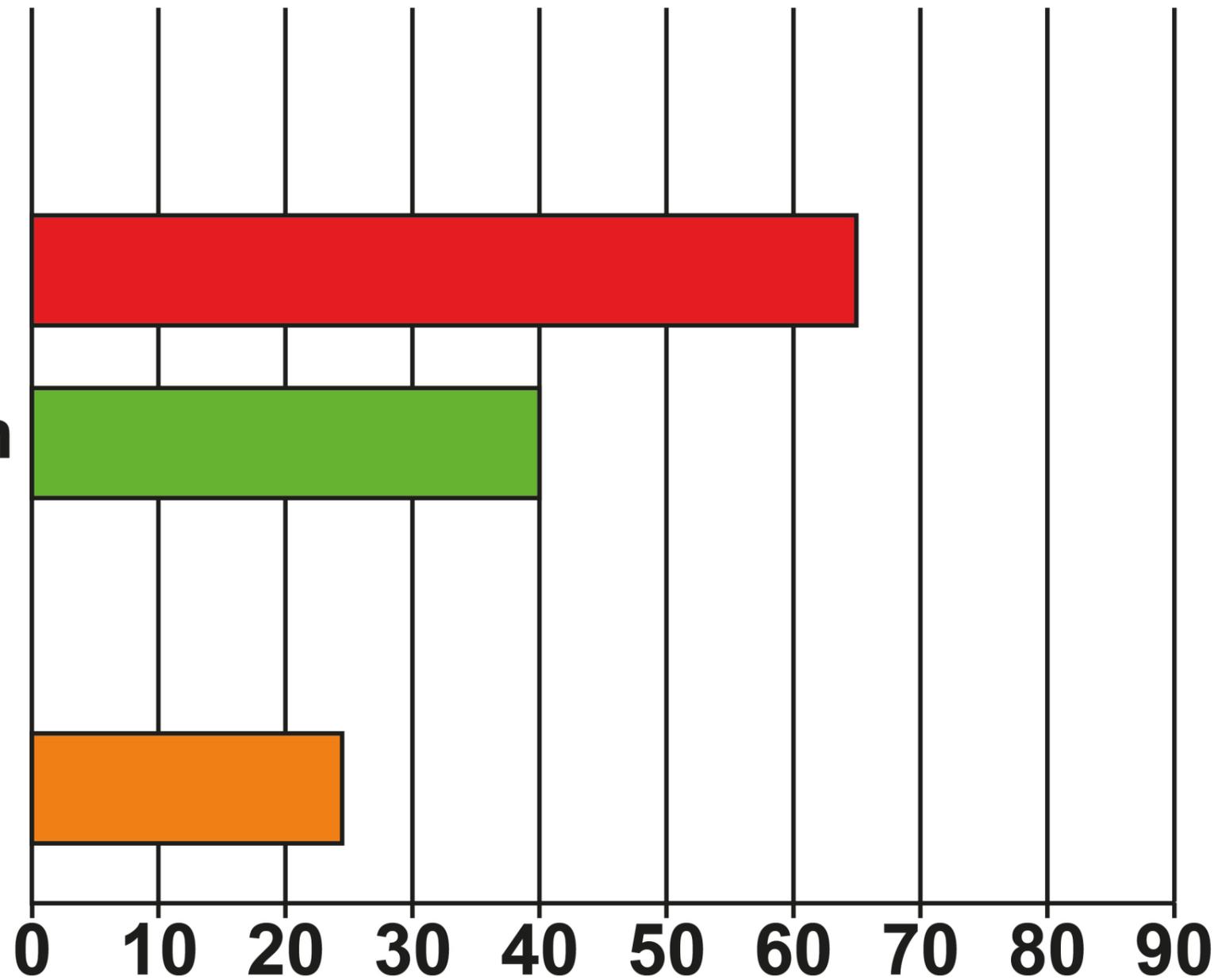
**Letters  
and  
numbers**

**Role play**

**Construction**

**Soft toys**

**Jigsaws  
and  
puzzles**



**59**

**[Turn over]**



5 9

2 3

**Give FIVE detailed specification points to help with the designing of a toy for use by a child between 3 and 5 years of age.**

**[5 marks]**

**1** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**2** \_\_\_\_\_

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\_\_\_\_\_

**3** \_\_\_\_\_

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**4** \_\_\_\_\_

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5

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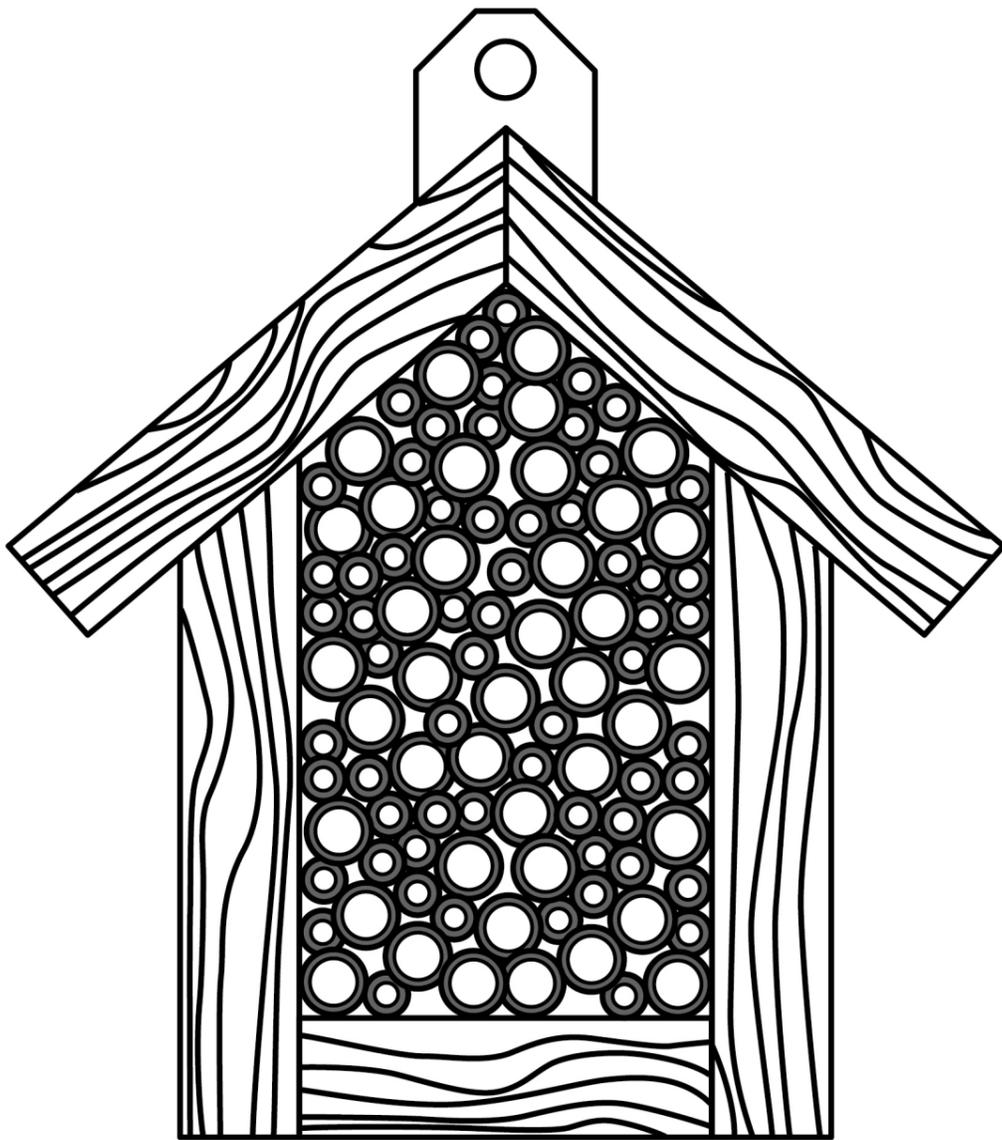
**[Turn over]**

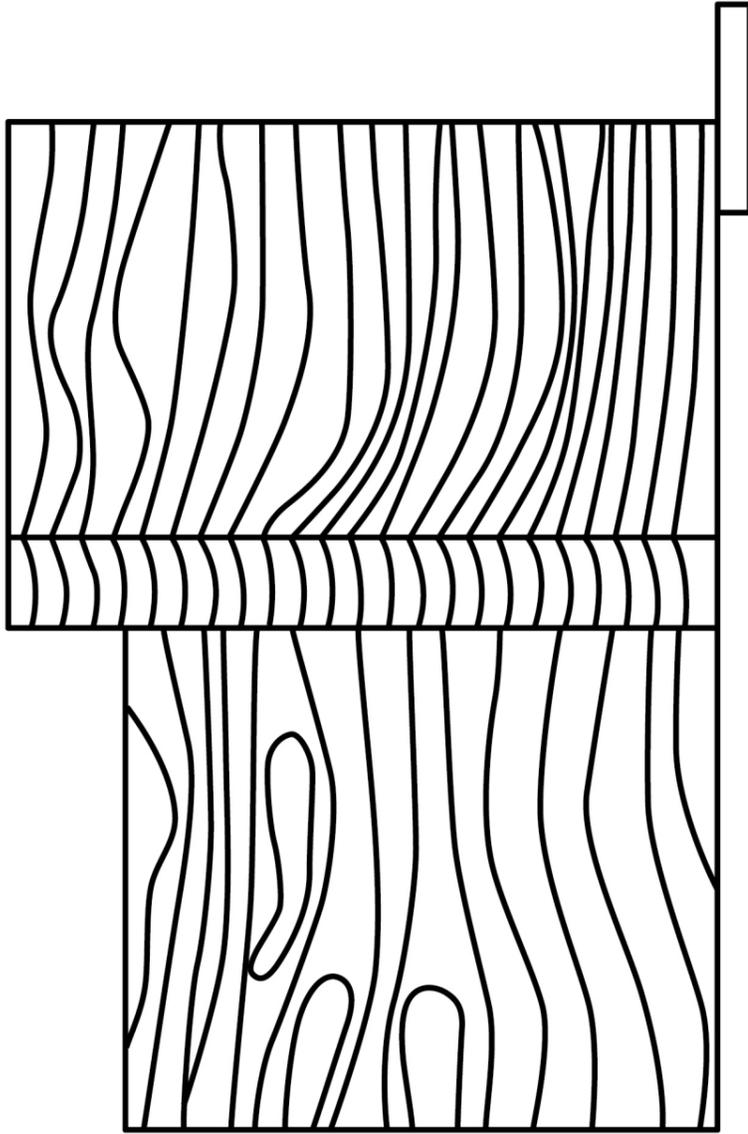


24

**FIGURES 8 and 9 show a front and side view of a bug box used to encourage insects to visit a garden.**

## **FIGURE 8**



**FIGURE 9**

**The front and side views are  
drawn in third angle projection  
Hidden detail has not been included**

**[Turn over]**



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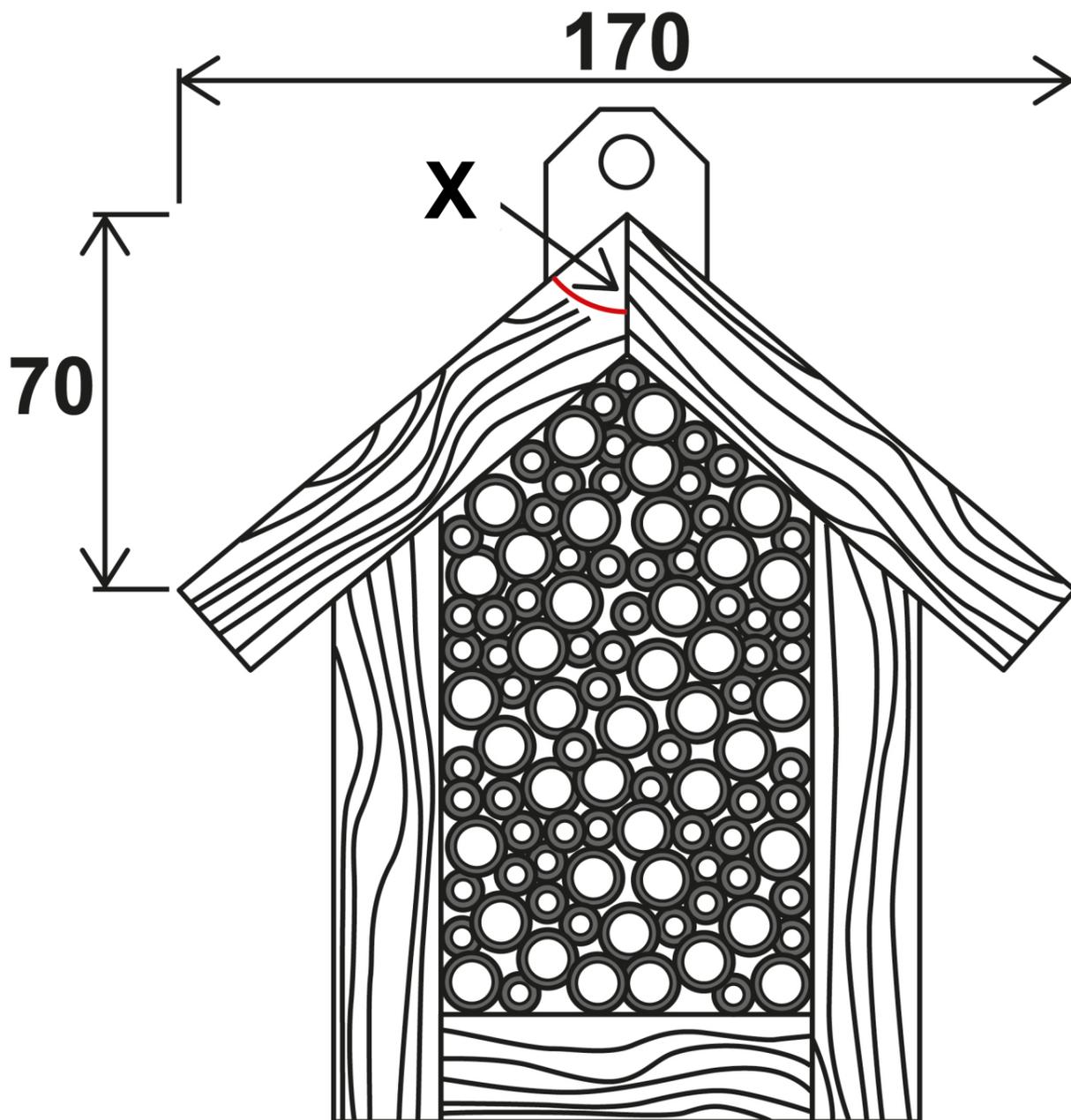


2	4	.	1
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**Complete a two-point perspective drawing of the bug box in the space provided below. [4 marks]**

**[Turn over]**



**24.2****FIGURE 10**

**All dimensions are  
in millimetres  
Not drawn to scale**



**Calculate the size of angle X in FIGURE 10 to the nearest whole degree to ensure an accurate fit of the two roof pieces.**

**Show your working/construction.  
[4 marks]**

**Answer** \_\_\_\_\_

**[Turn over]**















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For Examiner's Use	
Section	Mark
A	
B	
C	
TOTAL	

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