

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE
A565/01

DESIGN AND TECHNOLOGY
Resistant Materials
Sustainability and Technical Aspects
of Designing and Making

THURSDAY 14 JUNE 2018: Afternoon
DURATION: 1 hour 30 minutes
plus your additional time allowance

MODIFIED ENLARGED

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

None

READ INSTRUCTIONS OVERLEAF



INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the boxes on the front page. Please write clearly and in capital letters.

Use black ink. HB pencil may be used for graphs and diagrams only.

Answer ALL the questions in Section A AND Section B.

Read each question carefully. Make sure you know what you have to do before starting your answer.

Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 80.

All dimensions are in millimetres unless stated otherwise.

Your quality of written communication is assessed in questions marked with an asterisk (*).

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SECTION A

Answer ALL the questions.

You are advised to spend 40 minutes on this section.

On questions 1–5 circle your answer.

1 Which of the following describes the proper purpose of wind farms?

(a) Collecting methane gas.

(b) Generating electricity.

(c) Providing nesting sites for birds.

(d) Creating a moving sculpture in the countryside.

[1]

2 Which of the following terms refers to giving a new purpose to a product, without changing it?

(a) Reproduction.

(b) Reflection.

(c) Reuse.

(d) Research. [1]

- 3 The life cycle of a product begins with:**
- (a) Maintenance.**
 - (b) Disposal.**
 - (c) Raw material extraction.**
 - (d) Distribution. [1]**
- 4 Which of the following forms of power is a non-renewable source of energy?**
- (a) Wave.**
 - (b) Solar.**
 - (c) Hydro-electricity.**
 - (d) Coal. [1]**
- 5 Which of the following gives the meaning of the European Ecolabel?**
- (a) A product has a reduced environmental impact compared to similar products.**
 - (b) A product is made only in Europe.**
 - (c) A product is approved for sale in Europe.**
 - (d) A product is battery-powered. [1]**

- 6 State why the recycling symbol shown below is incorrect.**



_____ [1]

- 7 The letters CAD stand for:**

Computer A _____ Design. [1]

- 8 The ozone layer in the upper atmosphere protects us from which harmful solar radiation?**

_____ [1]

- 9 State the name of smart, modern materials that change colour according to the brightness of light shining on them.**

_____ [1]

- 10 Give ONE commonly used method of waste disposal.**

_____ [1]

Decide whether each of the following statements is TRUE or FALSE.

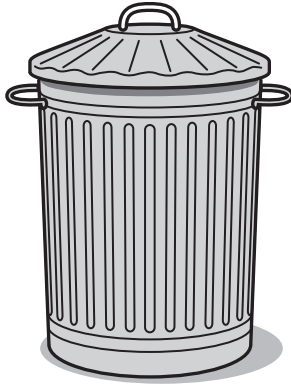
Tick (✓) the box to show your answer.

	TRUE	FALSE	
11 Thermoplastic products can be manufactured only from recycled plastic bottles.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
12 COSHH regulations control the level of exposure of workers to softwood dust.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
13 Safety guards on workshop machinery are not needed when an adult is present.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
14 Quality Control only occurs when the production process is complete.	<input type="checkbox"/>	<input type="checkbox"/>	[1]
15 Eco footprint is a measure of the environmental impact of our actions.	<input type="checkbox"/>	<input type="checkbox"/>	[1]

16 Fig. 1 shows three waste bins used for different purposes, and their capacity in litres.

Fig. 1

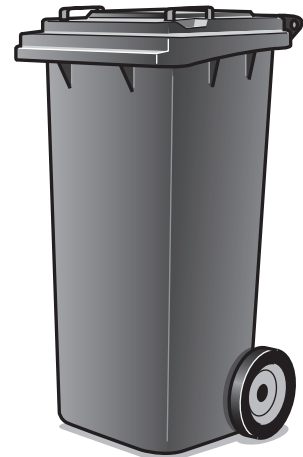
**Ash bin
90 litres**



**Rubbish bin
90 litres**



**Wheelie bin
140 litres**



(a) Different types of waste bins are often manufactured in one country and then exported all over the world.

State the name given to this form of manufacture and distribution.

_____ [1]

**(b) The ash bin in Fig. 1 is made from corrugated, zinc plated mild steel.
With reference to this bin:**

(i) Explain the term ‘corrugated’.

[2]

(ii) Explain why the mild steel has been zinc plated.

[2]

(iii) Explain one advantage of using mild steel for the ash bin, rather than plastic.

[2]

- (c) The rubbish bin shown in Fig. 1 is made from a moulded plastic. Give TWO reasons why plastic is suitable for this bin.**

1 _____

2 _____

[2]

- (d) Compared to the other two bins in Fig. 1, the wheelie bin is taller, has a greater capacity and is heavier when full.**

Describe TWO design features of the wheelie bin that have been influenced by these features.

1 _____

2 _____

[4]

- (e) Give the name of the scientific studies concerned with how products are shaped to fit the people that use them.**

_____ **[1]**

(f)* Wheelie bins are now very common as waste containers in this country.

Discuss the advantages of using environmentally unfriendly plastics to store household rubbish. [6]

[illegible]

SECTION B

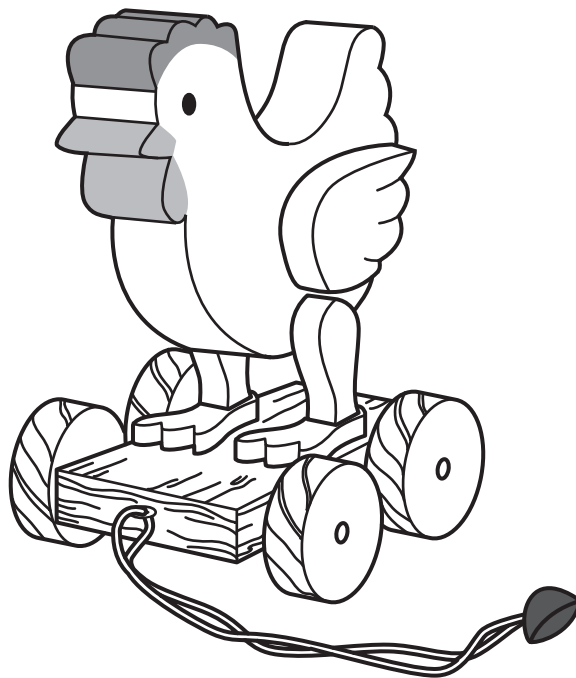
Answer **ALL** the questions.

You are advised to spend 50 minutes on this section.

17 Fig. 2 shows a pull-along toy for a young child.

The body, wings, legs and feet will be cut from MDF and then painted. The base and wheels are to be made from a decorative hardwood with a clear coating.

Fig. 2



(a) Name a suitable hardwood for the base and wheels.

_____ [1]

(b) The hardwood will not be painted, but will be finished with a clear coating.

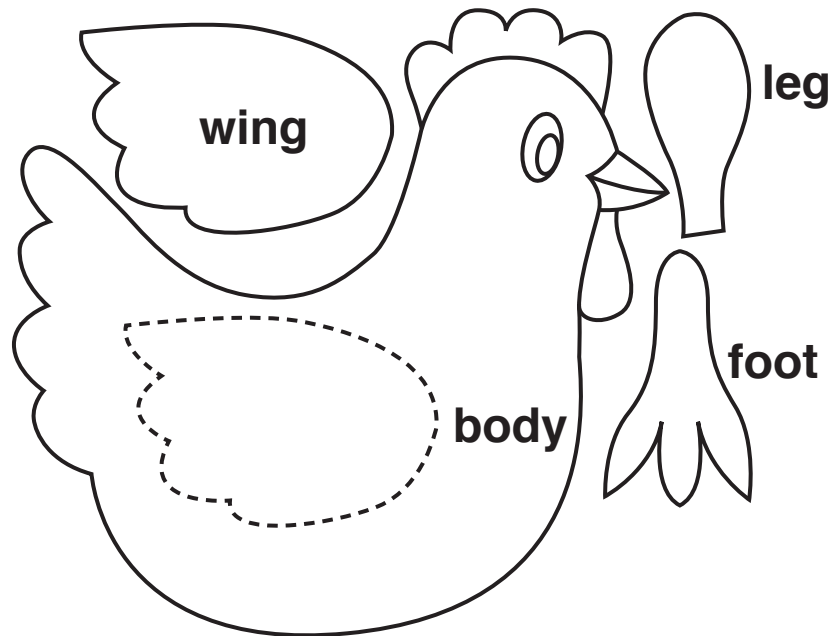
Explain TWO reasons why the hardwood is finished this way. [4]

1 _____

2 _____

- (c) Fig. 3 shows a drawing of the parts of the pull-along toy. The body will be cut from thicker MDF than the other components.

Fig. 3



- (i) Fig. 3 has been drawn to a scale of 1:2.

Explain what is meant by a scale of 1:2.

[2]

(ii) Give FOUR instructions to inform the maker how these components should be cut out before smoothing.

1 _____

2 _____

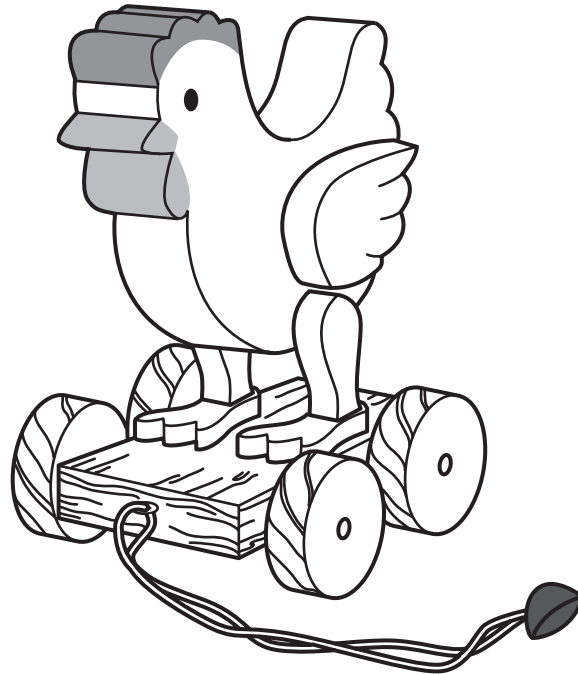
3 _____

4 _____

[4]

- (d) To make the toy shown in Fig. 2 more appealing it needs to rock from side to side as it is pulled along. Fig. 2 is shown again below.

Fig. 2



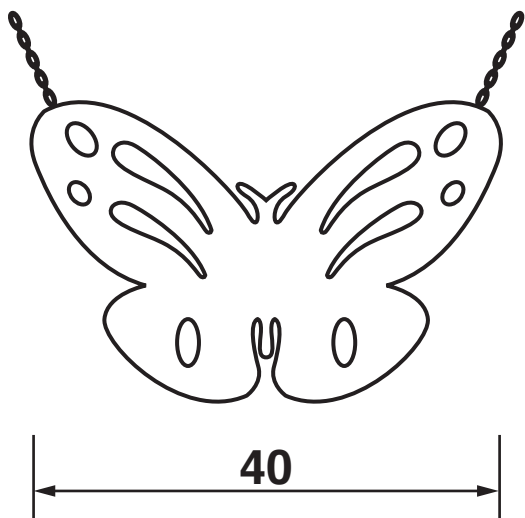
In the space opposite, use notes and sketches to show how this rocking motion can be achieved, WITHOUT using any extra components.

Show all construction details. [4]

Show your construction details here.

18 Fig. 4 shows a decorative pendant in the shape of a butterfly.

Fig. 4



(a) (i) The pendant will be made from red, see-through acrylic sheet.

Tick (✓) the correct technical term which means see-through. [1]

Opaque	Transparent	Translucent	Cloudy

(ii) State an appropriate thickness for the acrylic sheet.

_____ [1]

(b) In the space below, use notes and sketches to show how the acrylic sheet can be pierced and cut using hand tools.

Include details of any tools and techniques used.

[4]

(c) Explain ONE method which could be used to make the flat design look more life-like.

[2]

(d) Name ONE thermoforming plastic, other than acrylic, that could be suitable for this pendant.

[1]

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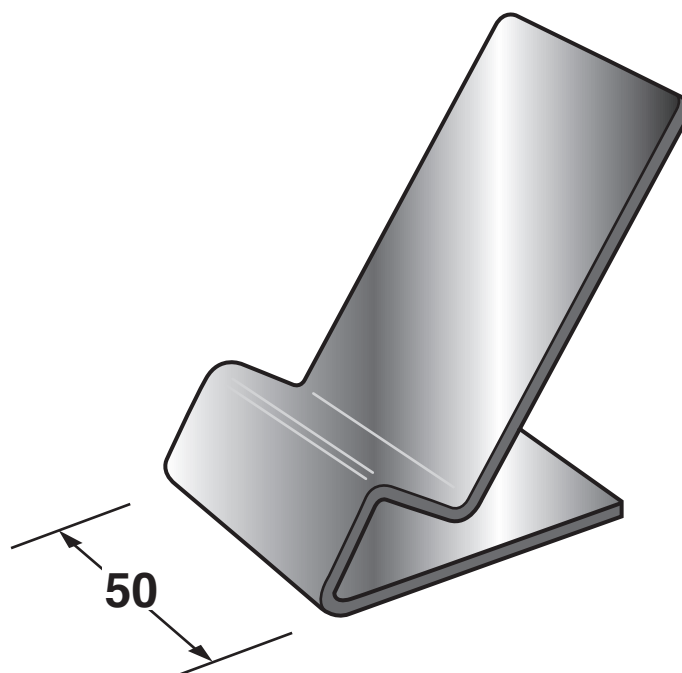
(e)* A batch of pendants could be cut using a modern laser cutter.

Discuss the advantages and disadvantages of using laser cutters to pierce and shape small objects. [6]

[illegible]

- 19 Fig. 5 shows a mobile phone stand made from mild steel strip, 50 mm wide.

Fig. 5



- (a) The faces of the strip need to be marked where it is to be bent.

Give the name of **THREE** tools needed to mark one of the faces.

1 _____

2 _____

3 _____

[3]

- (b) When bent to shape, the mobile phone stand will be given a paint finish.**

State TWO reasons for painting the mild steel.

1 _____

2 _____

[2]

- (c) An alternative to a paint finish would be a plastic dip coating.**

Give THREE stages in the process of dip coating.

1 _____

2 _____

3 _____

[3]

- (d) The mobile phone stand is to be modified to prevent the phone from slipping off the smooth surface.**

Give ONE way the mobile phone stand could be modified.

_____ **[1]**

- (e) In the space opposite, use sketches and notes to show ONE design idea for a stand for a tablet computer.**

Your stand should be:

capable of being adjusted to provide a comfortable viewing angle

capable of being folded flat for storage

lightweight

able to support a tablet of approximately 275 × 180 mm

made from a metal that does not require protection

finished so that it does not scratch the surface on which it is placed, or the back of the tablet.

Include details of materials and methods of construction. [6]

Show your idea for a stand design here.

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

[illegible]

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