



General Certificate of Secondary Education
2019

Centre Number

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Candidate Number

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Technology and Design

Unit 2

Option C:
Product Design

MV18

[GTY23]

FRIDAY 31 MAY, MORNING

Time

1 hour 30 minutes, plus your additional time allowance.

Instructions to Candidates

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write on blank pages.

Questions which require drawing or sketching should be completed using an H.B. pencil. All written questions must be completed using blue or black ink only.

Do not write in pencil or with a gel pen.

Answer **all** questions.

Information for Candidates

The total mark for this paper is 100.

Quality of written communication will be assessed in Question 8. Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.

1 (a) Safety is very important when using tools and equipment in a workshop.

Outline **three** key safety precautions that should be obeyed when using a metal lathe. [1 mark for each]

1. _____

2. _____

3. _____

(b) Discuss **two** environmental benefits of recycling old tools and equipment. [2 marks for each]

1. _____

2. _____

(c) (i) Which of the **two** products named below has built in obsolescence?

A dining room table **or** a mobile phone. [1 mark]

(ii) Give a reason for your choice. [1 mark]

2 A product life cycle consists of **five** important stages.

One of these stages is called the growth stage.

(i) Name the other **four** stages. [1 mark for each]

1. _____
2. _____
3. _____
4. _____

(ii) Describe **three** characteristics associated with the growth stage of a product. [2 marks for each]

1. _____

2. _____

3. _____

3 Many industrial practices make use of robotics.

(a) Explain why this is the case by focusing on **three** appropriate points. [6 marks]

1. _____

2. _____

3. _____

(b) State **four** specific tasks or uses that can be undertaken by robots. [4 marks]

1. _____

2. _____

3. _____

4. _____

- 4 **Fig. 1** shows the Juicy Salif citrus squeezer designed and produced by Philippe Starck.

Fig. 1



- (a) (i) Look at the Juicy Salif citrus squeezer in **Fig. 1** and describe **two** features that may be associated with its design. [1 mark for each]

1. _____

2. _____

(ii) Function and form are **two** features in product design. Does function follow form or does form follow function in the product in **Fig. 1**? [1 mark]

(iii) Give a reason why this Juicy Salif citrus squeezer would not be mass produced. [1 mark]

(b) Outline **five** features associated with the design work of Philippe Starck. [1 mark for each]

1. _____

2. _____

3. _____

4. _____

5. _____

5 Fig. 2 shows a hardwood table.

Fig. 2



(a) State **one** specification point for the design of the table and explain its importance. [2 marks]

Specification point: _____

Explanation: _____

(b) Name a suitable hardwood for the table. [1 mark]

(c) Identify **two** properties of the hardwood named in part (b) which make it suitable for use as a table.
[2 marks]

1. _____

2. _____

(d) (i) Using the information given below calculate how many table legs the manufacturer will obtain from 8 lengths of hardwood square section allowing 20mm of waste per leg due to cutting and sizing.
[3 marks]

- Hardwood square section measurements:
50 × 50 × 3000 mm
- Table legs dimensions: 50 × 50 × 480 mm

Answer _____

- (ii) Calculate the total amount of waste produced in making the table legs from the 8 lengths of hardwood square section. [2 marks]

Answer _____

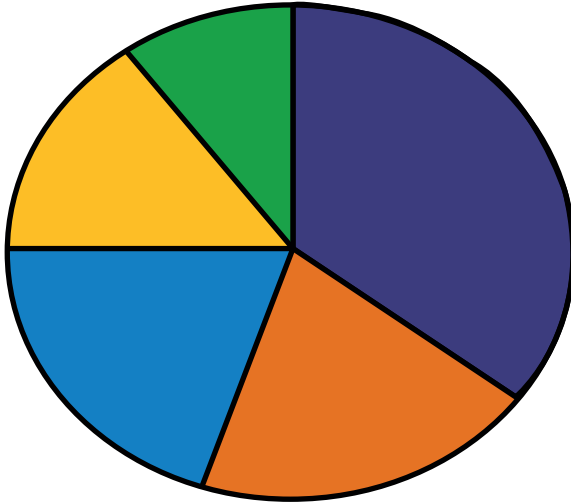
(e) Look at **Fig. 2** on page 8. Using clear annotated sketches and construction detail show in the space below: [10 marks]






- How the legs of the table could be attached to the rails under the tabletop.
- How the tabletop could be extended to provide a bigger surface area as and when required.

- 6 (a) Fig. 3 shows a pie chart of the percentage sales of 1800 wooden toys made by a manufacturer.

Fig. 3

Percent (%) of Toys Sold



Type of toy	% Sold
 Bus	35
 Car	20
 Lorry	20
 Taxi	15
 Motorbike	

- (i) Calculate the percentage of the sales for the motorbike. [1 mark]

Answer _____

- (ii) Complete **Table 1** by inserting the number of wooden toys sold by each type. [5 marks]

Table 1

Type of toy	% Sold	Number of toys sold
Bus	35	
Car	20	
Lorry	20	
Taxi	15	
Motorbike		

- (iii) Each toy is sold at £19.50 with a profit of 15%. Calculate how much profit is made on the sale of 1800 wooden toys. [3 marks]

Answer: _____

(iv) If the cost of the wood increases, the selling price of a toy must increase by 12.5%. Calculate the new selling price (to the nearest 1p). [3 marks]

Answer: _____

- 7 **Fig. 4** shows a picture of a child's push scooter. A detailed manufacturing specification is essential and must be prepared for the production processes of the scooter.

Fig. 4



- (a) Why is it important to have a manufacturing specification? [2 marks]

(b) (i) A production plan should be prepared for each stage of manufacture.

Name a method that could be used for this plan.
[1 mark]

(ii) Identify **two** key elements of the suggested production plan. [1 mark for each]

1. _____

2. _____

(c) (i) When the child's push scooter is ready for the market its key features need to be identified.

List **three** possible key features of the scooter.
[1 mark for each]

1. _____

2. _____

3. _____

(ii) Suggest **two** anthropometric factors of the push scooter. [1 mark for each]

1. _____

2. _____

- 8 Using an annotated sketch or sketches, design a foldaway stool suitable for use at home by children of playschool age. [20 marks]

The design solution should show evidence of the following features:

- Good quality annotated sketches giving consideration to line, shape, form and proportion. The annotated sketches should clearly convey your design thinking.
- The portable foldaway stool must be free-standing: strong, stable and capable of being easily stored.
- Identify and justify the choice and use of materials.
- Capable of supporting a child of playschool age.
- Be aesthetically pleasing.
- Including three key dimensions.
- Identify and justify the main manufacturing techniques used in the design's construction.

Use the following two pages for your answer.

Quality of written communication will be assessed in this question.

THIS IS THE END OF THE QUESTION PAPER

SOURCES

Q4 © Getty Images

Q5. © Getty Images

Q6(a) Source: © Principal Examiner

Q7. © Getty Images

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
Total Marks	

Examiner Number

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