



National  
Qualifications  
2024

**X819/76/11**

**Design and Manufacture**

WEDNESDAY, 1 MAY

1:00 PM – 3:15 PM

**Total marks — 80**

**SECTION 1 — 25 marks**

Attempt ALL questions.

**SECTION 2 — 55 marks**

Attempt ALL questions.

Write your answers clearly in the answer booklet provided. In the answer booklet you must clearly identify the question number you are attempting.

Use **blue** or **black** ink.

Before leaving the examination room you must give your answer booklet to the Invigilator; if you do not, you may lose all the marks for this paper.



\* X 8 1 9 7 6 1 1 \*

**SECTION 1 — 25 marks**

**Attempt ALL questions**

1. Two sun loungers are shown below with product information.

**Luxury sun lounger**

**Materials**

mahogany frame

textured ABS tyre

stainless steel nuts/bolts

**Additional details**

four adjustable positions

self-assembly (tools included)

**Price – £249.99**



**Folding sun lounger**

**Materials**

tubular aluminium frame

nylon netting

polypropylene footpads and  
corner protectors

aluminium leg brackets

**Additional details**

five adjustable positions

**Price – £59.99**

## 1. (continued)

- |   |   |
|---|---|
| (a) Explain why the materials chosen are suitable for the sun loungers.<br>(You must give <i>six different explanations.</i> )                    | 6 |
| (b) Name <b>three</b> appropriate manufacturing processes used in the production of the sun loungers <b>and</b> explain why each one is suitable. | 6 |
| (c) Describe how function has influenced the design of the sun loungers.  | 5 |
| (d) Describe how anthropometrics and physiology have influenced the design of the sun loungers.   | 4 |
| (e) Explain the benefits of using computer aided design (CAD) during the design of the sun loungers.  | 4 |

[Turn over

## SECTION 2 — 55 marks

Attempt ALL questions

2. A children's play frame is shown below.



The slide and side panels of the play frame are rotational moulded.

- (a) Explain why rotational moulding is a suitable process for these parts. 2

- (b) State the name of a suitable material for these parts and explain why this material is appropriate. 3

It is important that products are environmentally friendly.

- (c) Outline steps that may have been taken to reduce the negative impact of products on the environment. 4

3. The success of a product relies on effective market research.

(a) Describe the key stages of **two** research techniques.

4

Different types of specification are produced for a variety of reasons.

(b) Outline the type of information that may be contained in **two** of the following specification types:

- product design specification
- performance specification
- technical specification.

4

4. During the design process, designers will use a variety of graphics and physical models.

(a) Describe how graphics could be used during the design process.

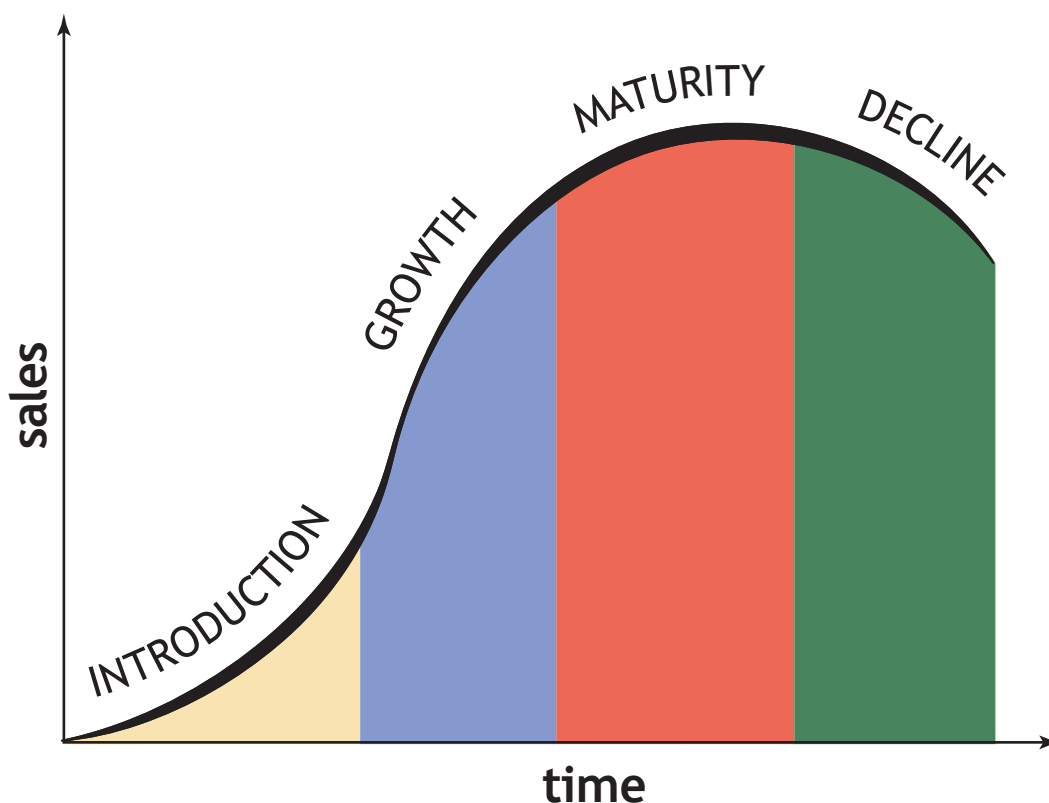
4

(b) Describe how physical models could be used during the design process.

4

[Turn over

5. A product life cycle graph is shown below.



During the introduction stage, marketing techniques are used.

(a) Describe marketing techniques that could be used to launch new products. 4

A strong brand image can increase sales.

(b) Explain why a strong brand image can lead to increased sales. 3

At the end of the product life cycle, sales will begin to decline.

(c) Explain the factors that may cause product sales to decline. 3

Copyright is a method of protecting intellectual property.

(d) Identify another method of protecting intellectual property and give an example of what it protects. 2

	MARKS
6. There is often a need to identify the materials used in the manufacture of products.	
(a) Describe methods that could be used to identify the materials used in a product. <i>(You should reference different materials in your answer.)</i>	4
Designers must ensure products can be assembled accurately and efficiently.	
(b) Describe how manufacturing features could be used to ensure accurate and efficient assembly.	2
Products can be manufactured using automated production methods.	
(c) Describe how automated production methods could impact the workforce and society.	4
7. Production and planning systems are used in the development and manufacture of new products.	
Explain why production and planning systems are used. <i>(You should refer to a range of different production and planning systems in your answer.)</i>	8

**[END OF QUESTION PAPER]**

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