



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.
(You must give <i>six different explanations.</i>) | 6 |
| (b) Name three appropriate manufacturing processes used in the production of the sun loungers and 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.

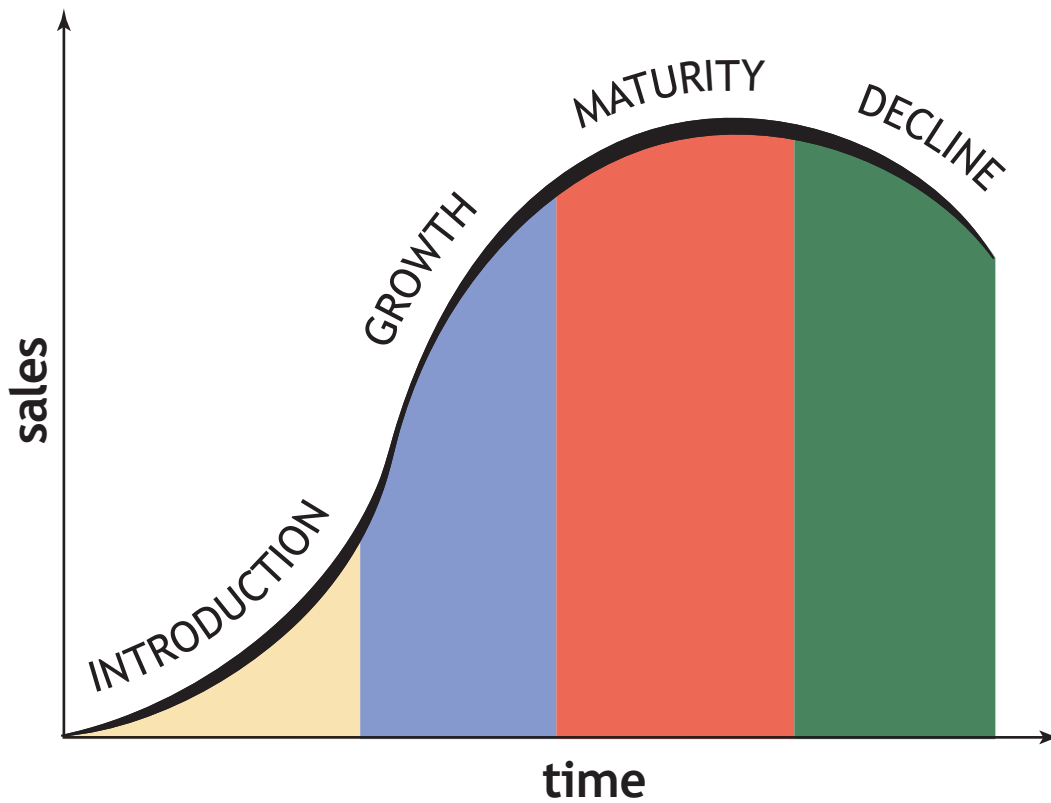
4

(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

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.
(You should reference different materials in your answer.) 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. 8
- (You should refer to a range of different production and planning systems in your answer.)*

[END OF QUESTION PAPER]

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