



National
Qualifications
2026

X819/76/11

Design and Manufacture

WEDNESDAY, 13 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.

You must leave your answer booklet on your desk; if you do not, you could lose all the marks for this paper.



SECTION 1 — 25 marks

Attempt ALL questions

1. Two lamps are shown below with product information.

Adjustable tripod spotlight

Materials

stained solid beech frame
stainless steel spotlight casing
acrylic spotlight lens
ABS on/off control switch
brass fixings

Additional details

foot operated on/off switch



Dimmable uplighter with reading lamp

Materials

chrome plated tubular mild steel frame
chrome plated mild steel shades
mild steel base

Additional details

dimnable light
adjustable reading lamp
self-assembly

1. (continued)

- | | |
|--|---|
| (a) Explain why the materials chosen are suitable for the lamps.
<i>(You must give six different explanations.)</i> | 6 |
| (b) Name three appropriate manufacturing processes used in the production of the lamps and explain why each one is suitable. | 6 |
| (c) Describe how function has influenced the design of the lamps. | 5 |
| (d) Describe how different aesthetic aspects have influenced the design of the lamps.
<i>(You must refer to a range of aesthetic aspects in your answer.)</i> | 4 |
| (e) Describe how production and planning systems could be used to improve efficiency during the manufacture of products such as the lamps. | 4 |

[Turn over

SECTION 2 — 55 marks

Attempt ALL questions

2. A badminton racket is shown below.



The frame of the badminton racket is manufactured from a composite material.

- (a) State the name of a suitable composite material **and** explain the benefits of using composite materials in the manufacture of products such as the badminton racket.

3

Different techniques can be used to evaluate the performance of the badminton racket.

- (b) Describe the key stages of the following techniques that can be used to evaluate performance:
- user trial
 - test rigs.

4

Branding can influence the success of a product.

- (c) Describe the benefits of launching under a successful brand name.

2

3. Companies protect their Intellectual Property Rights (IPR) using a variety of methods.

- (a) Identify **two** methods of protecting the IPR of products **and** outline what each method protects.

4

As part of their role within the design team, lawyers are responsible for securing IPR.

- (b) Describe the role of **two** other members of a design team.

4

4. A hairdryer is shown below.



The casing for the hairdryer has been manufactured using ABS.

- (a) Explain why ABS is suitable for the manufacture of the casing of this product.

2

The designer may have used brainstorming to generate ideas for the hairdryer.

- (b) Explain the benefits of using brainstorming to generate ideas.

2

Designers would have used a variety of graphic techniques throughout the design of the hairdryer.

- (c) Describe how graphic techniques could have been used to communicate during the following stages of the design process:

- initial ideas
- manufacture
- marketing.

6

[Turn over

5. A robot vacuum cleaner is shown below.



The robot vacuum cleaner has been targeted at a niche market.

- (a) Explain what is meant by the term niche market.

2

Technology push and market pull can result in new or improved products being created, like the robot vacuum cleaner.

- (b) Describe how technology push **and** market pull have influenced the design of a product(s) with which you are familiar.

4

Computer Aided Design (CAD) may have been used during the development of the robot vacuum cleaner.

- (c) Explain the advantages of using CAD during the development of products such as the robot vacuum cleaner.

4

6. Symbols and labels can be included on products to help identify materials.

- (a) Describe methods, other than symbols and labels, that could be used to identify woods, metals and/or plastics.

3

Products can be assembled using knock-down fittings.

- (b) Explain the advantages of using knock-down fittings in the assembly of products.

3

Many products are now manufactured using fully automated production methods.

- (c) Explain the impact of fully automated production methods on the workforce and society.

4

7. Successful products will have had careful consideration of all three areas of ergonomics.

Describe how ergonomics has influenced the design of products with which you are familiar.

8

(You should refer to all three areas of ergonomics in your answer.)

[END OF QUESTION PAPER]

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- Question 1 Adjustable tripod — Three images of Two Tone Spotlight Floor Lamp with Wooden Tripod are taken from https://www.culinaryconcepts.co.uk/spotlight-floor-lamp-with-wood-tripod?srsId=AfmBOoru12sl6PZ2paWE_wjZvrm-PP0h5rS3MujeDegtuHHqqnQohOs%7C%20.
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