

# **X211/201**

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NATIONAL  
QUALIFICATIONS  
2008

THURSDAY, 29 MAY  
1.00 PM – 2.30 PM

PRODUCT DESIGN  
INTERMEDIATE 2

50 marks are allocated to this paper.

Where appropriate you may use sketches to illustrate your answer.

Within each question, marks will not be awarded for repetition.



## Attempt all questions

## SECTION A

1. An ironing board is shown below.

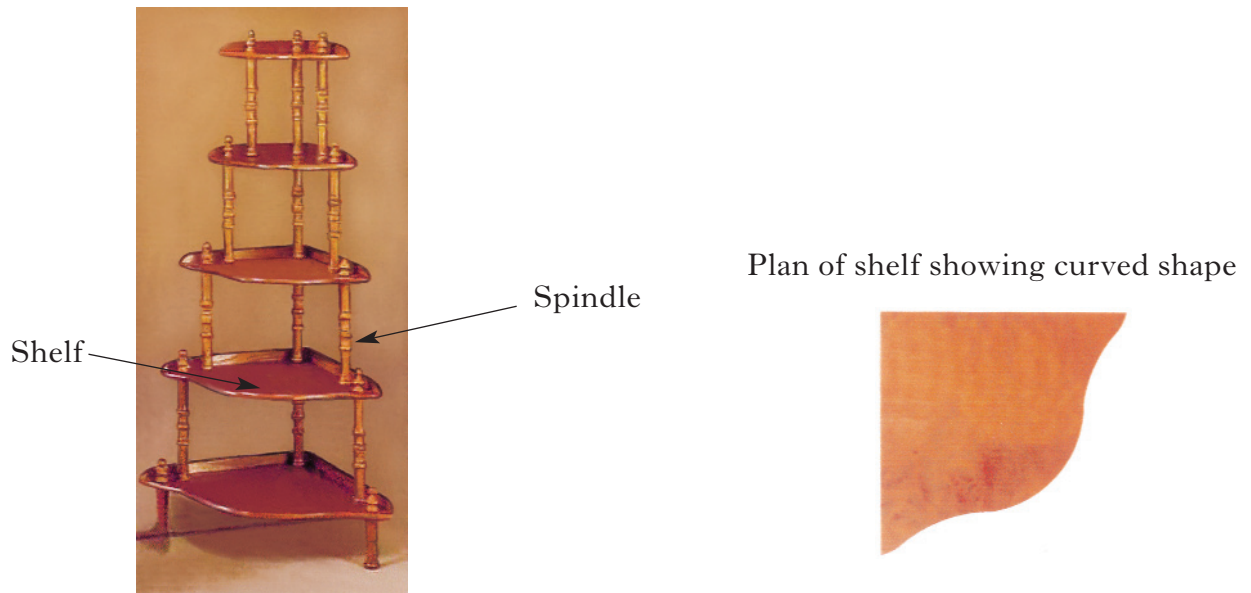


- (a) (i) State **two** reasons why tubular steel is a suitable material for the legs and feet of the ironing board. 2
- (ii) State a suitable manufacturing process for the thermoplastic end caps **and** state a reason why this process is suitable. 2
- (iii) State **two** reasons why manufactured board is a suitable material for the table of the ironing board. 2
- (iv) State a suitable method of joining the legs to the feet **and** state a reason why this joining method is appropriate. 2
- (b) Describe how the design of the ironing board has been influenced by each of the following ergonomic aspects:
- (i) anthropometrics; 2
- (ii) physiology; 2
- (iii) psychology. 2
- (c) Describe how the design of the ironing board has been influenced by each of the following design issues:
- (i) function; 2
- (ii) safety; 2
- (iii) durability. 2

**Total for Section A (20)**

## SECTION B

2. The corner-shelving unit shown below is constructed from hardwood and is sold as a flat-pack.

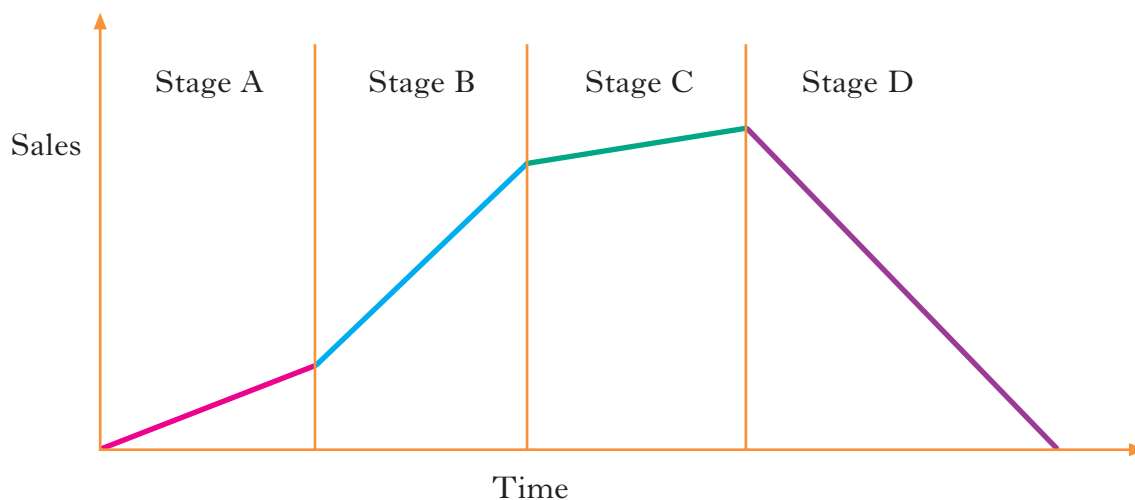


- (a) (i) State the name of a suitable manufacturing process for the spindles. **1**
- (ii) Describe a method of joining the spindles to the shelves. **2**  
*(Sketches may be used to illustrate your answer.)*
- (iii) State the name of a power tool which could have been used to produce the curved shape of the shelves. **1**
- (b) State **two disadvantages** to the **consumer** of flat-packed furniture. **2**
- (c) State **two** reasons why using a softwood would be more environmentally friendly than using a hardwood. **2**
- (d) State the name of **two** suitable finishes that could be applied to the hardwood. **2**
- (10)**

**[Turn over**

3. As products in the market place come and go, they are said to have a “product life cycle”.

The four stages of a typical *product life cycle* are shown in the graph below.



- (a) From the above graph, identify
- (i) at which stage consumers stop buying the product. 1
  - (ii) at which stage the product is launched onto the market. 1
  - (iii) at which stage consumers begin to have confidence in the product. 1
- (b) “Planned obsolescence” can be a feature of modern products.  
**Explain** the term “*planned obsolescence*”. 2
- (5)**

4. Two different styles of clock are shown below.



Clock A



Clock B

(a) State a target market for **one** of the clocks shown and give a reason for your answer.

2

(b) State which clock is likely to have been hand made and give **two** reasons for your answer.

3

(5)

[Turn over

5. An evaluation of the sports activity helmet shown below is to be carried out by the manufacturer.



**Describe** how the following methods could be used to evaluate aspects of the helmet:

(Note: a different aspect must be used for each method)

- |     |  |             |   |
|-----|--|-------------|---|
| (a) | (i)  | user trial; | 2 |
|     | (ii)   | test rig;   | 2 |
|     | (iii)  | survey.     | 2 |
| (b) | The symbol shown below can be found on the helmet. |             |   |



- |     |      |  |             |
|-----|------|--|-------------|
|     |      | State the name of this symbol and explain its purpose.   | 2           |
| (c) | (i)  | Helmets are often made from <i>composite materials</i> .<br>Explain the term <i>composite material</i> . | 1           |
|     | (ii) | State the name of any composite material.  | 1           |
|     |      |  | <b>(10)</b> |

**Total for Section B (30)**

[END OF QUESTION PAPER]

## ACKNOWLEDGEMENTS

Question 1—Picture of an Ironing Board. Reproduced by kind permission of Reliable Corporation.

Question 4—Picture of a clock. No further action as cannot trace source.

Question 5—Picture of a helmet. Reproduced by kind permission of Petzl.

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