

# X211/201

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NATIONAL  
QUALIFICATIONS  
2007

TUESDAY, 22 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.

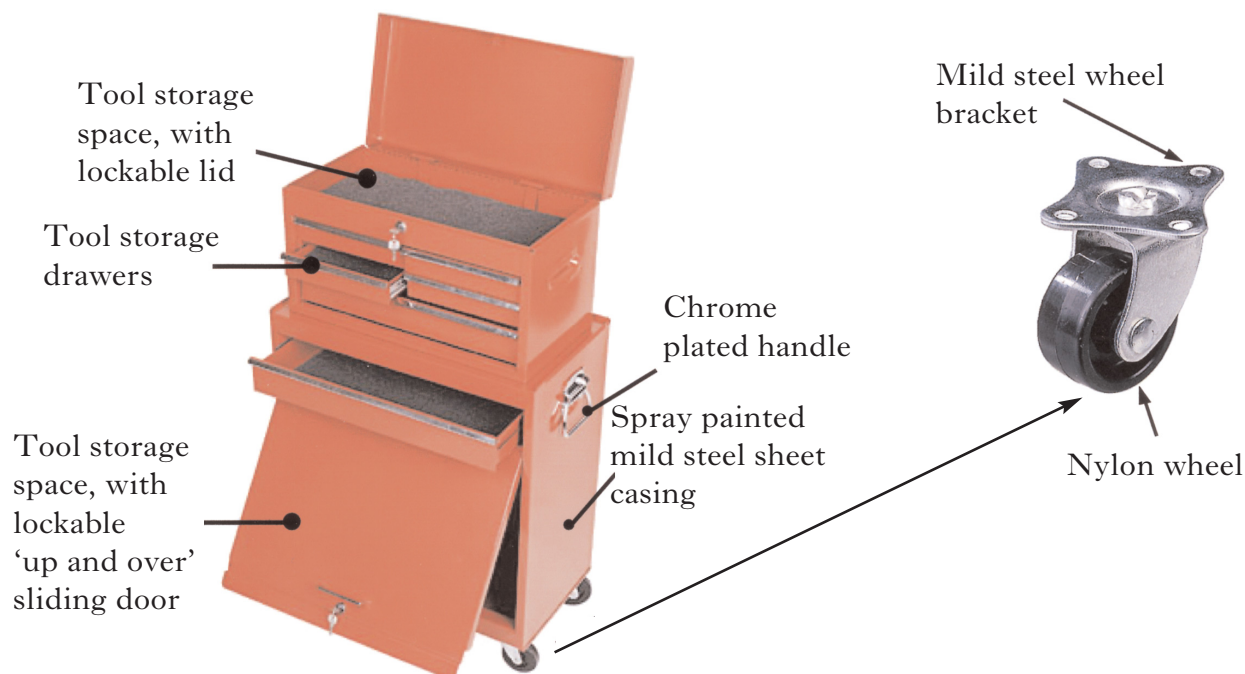
Within each question, marks will not be awarded for repetition.



## Attempt all questions

## SECTION A

1. A portable tool chest is shown below.



(a) With reference to the items shown:

- (i) state **two** reasons why mild steel sheet is a suitable material for the manufacture of the tool chest; 2
- (ii) other than painting, state **two** suitable protective finishes for the mild steel casing of the tool chest; 2
- (iii) state any suitable manufacturing process for the nylon wheel; 1
- (iv) state **two** reasons why nylon is a suitable material for the wheel; 2
- (v) state **any** process used in the manufacture of the mild steel wheel bracket. 1

(b) Describe how the design of the tool chest has been influenced by each of the following:

- (i) anthropometrics; 2
- (ii) physiology; 2
- (iii) psychology. 2

(c) Describe how the design of the tool chest could have been influenced by each of the following issues:

- (i) durability; 2
- (ii) function; 2
- (iii) safety. 2

**Total for Section A (20)**

## SECTION B

2. A child's backpack is shown below.

**Due to copyright restrictions the graphic for Question 2 has been removed.**

The manufacturer wishes to carry out an evaluation of the backpack.

(a) State an evaluation technique that could be used for each of the following aspects of the backpack:

- |                        |   |
|------------------------|---|
| (i) ease of use;       | 1 |
| (ii) aesthetics;       | 1 |
| (iii) value for money. | 1 |

*(Note: a different technique must be used for each aspect.)*

The <sup>TM</sup> symbol can be found on the backpack.

- |                                       |            |
|---------------------------------------|------------|
| (b) State what this symbol signifies. | 1          |
|                                       | <b>(4)</b> |

**[Turn over**

3. Computer mice are shown below.



**Before** producing a specification for a computer mouse, the designer would have researched various design issues.

With reference to computer mouse design:

- (a) state **four** design issues which would have been researched; 1
  - (b) explain why each of these design issues is important. 4
- (5)**

4. Five products are shown below along with a list of manufacturing processes.

Match each product with the most suitable manufacturing process from the list. (5)



(A)

Shampoo bottle



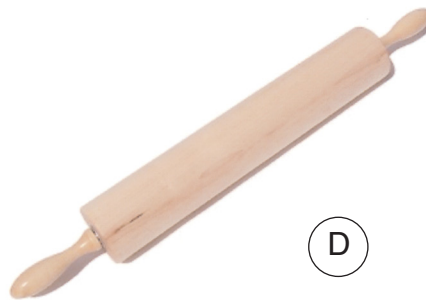
(B)

Garden hose



(C)

Chocolate box tray



(D)

Wooden rolling pin



(E)

Cheese grater

### Manufacturing Processes

- Rotational moulding
- Extrusion
- Press-forming
- Sand casting
- Routering
- Vacuum forming
- Blow moulding
- Turning

[Turn over

5. During the design process, a professional designer will use various materials to build simple models.

(a) State **two** reasons why the designer would build simple models. 2

(b) State the name of **two** materials that could be used to produce a simple model and explain why each material is suitable. 4

(Note: a different explanation should be given for each material.) (6)

6. Inflatable chairs manufactured from sheet PVC are shown below.



With reference to the inflatable chairs, **explain** the importance of the following design issues:

(a) environmental concern; 2

(b) choice of materials; 2

(c) consumer demand. 2

(Note: a different explanation should be given for each design issue.) (6)

7. Surfboards are shown below.



Describe the **aesthetic** qualities of the surfboards.

(4)

**Total for Section B (30)**

[END OF QUESTION PAPER]

## ACKNOWLEDGEMENTS

Section B Question 3 – Picture of BenQ computer mouse. Reproduced by kind permission of BenQ Europe B.V.

Section B Question 4 – Picture of a Garnier Fructis shampoo bottle. Permission sought from Garnier.