

X211/301

NATIONAL
QUALIFICATIONS
2010

TUESDAY, 18 MAY
1.00 PM – 3.00 PM

PRODUCT DESIGN
HIGHER

70 marks are allocated to this paper.



Attempt ALL questions.

SECTION A

1. Two bathroom accessory ranges are shown below.



Accessory Range A

Comprises waste bin, toilet brush and holder, toothbrush holder, tumbler and soap dish.

Manufactured from frosted acrylic.

Accessory Range B

Comprises toilet roll holder, hand towel ring, tumbler ring including tumbler, robe hook and towel rail.

Manufactured from chrome plated metal and glass.

Glass shelf sold separately (available in plain or frosted glass).



1. (continued)

Each of the bathroom accessory ranges shown have been designed for well-known high street retailers.

- | | |
|--|-------------|
| (a) Write a product specification for one of the bathroom accessory ranges in relation to its target market. | 6 |
| (b) Justify the choice of materials used to produce both ranges. | 6 |
| (c) Justify the production processes that would be suitable for the manufacture of both ranges of bathroom accessories. | 6 |
| (d) Explain how both bathroom accessory ranges have been influenced by function. | 4 |
| (e) Describe the appeal of both bathroom accessory ranges from the consumer's viewpoint. | 4 |
| (f) Describe the ergonomic issues associated with these types of products. | 4 |
| Total for Section A | (30) |

[Turn over

SECTION B

2. **Annotated sketches, working drawings and rendered 3D computer models** are three techniques used to communicate ideas during the design process.

For each of the techniques above:

Identify a stage in the design process where it could be used and explain why it is appropriate to that stage.

(6)

3. Developments in manufactured boards and fittings have enabled designers to create a wide range of affordable flat-pack furniture styles.



- (a) **Describe** the environmental issues surrounding the development of man-made boards.

2

- (b) **Explain** why “flat-packed” furniture is popular with:

(i) consumers;

2

(ii) manufacturers.

2

- (c) **Explain** how manufacturers ensure that flat-pack products can be easily assembled by consumers.

2

High quality furniture, using solid timbers and traditional construction methods, is still available to the consumer.

- (d) **Explain** why there is still a market for this type of furniture.

2

(10)

4. The components shown below have been manufactured by the process of compression moulding.



Smoke alarm casing



Car tailgate



Battery housing

- (a) **Explain** why compression moulding is suitable for these types of product. 2
- (b) **State** the name of a suitable material and explain why it is appropriate for the manufacture of components. 3
- (5)

[Turn over

5. Research is important in ensuring the success of a product.

(a) **Describe** the research information that would be required for the stages below.

(i) Initial concept

2

(ii) Planning for production

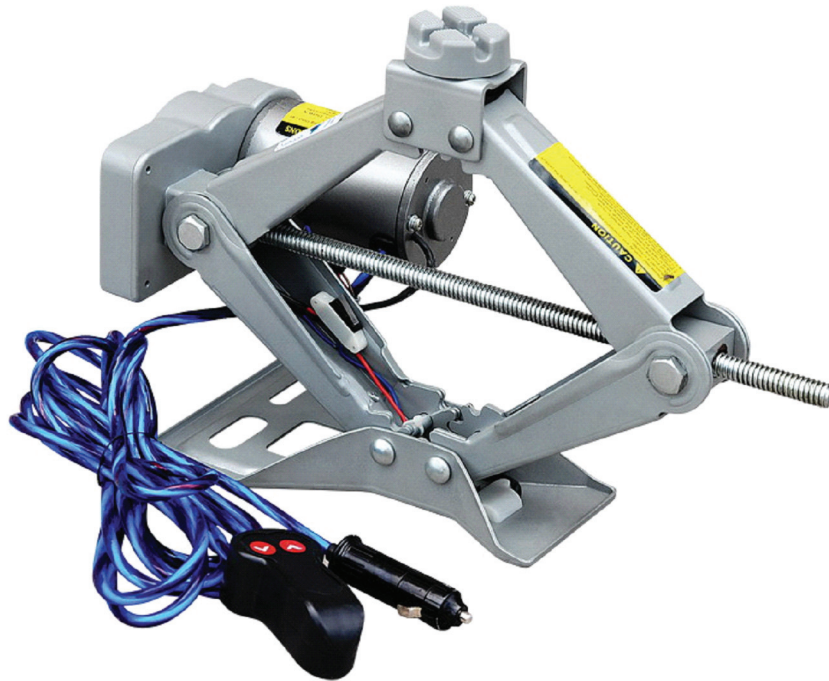
2

(b) **Describe** the information that would be identified by end user trials.

2

(6)

6. The base and frame of the car jack shown below has been manufactured by the processes of piercing and blanking, then press forming.



(a) **Explain** why these processes are suitable for manufacturing the components for this product.

3

Standard components such as nuts, bolts and rivets have been used in the car jack frame.

(b) **Explain** why it is appropriate to assemble the frame using these types of components.

2

(c) **Describe** the advantages to the manufacturer in using standard components.

2

(7)

7. A designer has been asked by a well-known manufacturer to produce designs for a range of electronic personal organisers.



- (a) **Describe** how advances in technology have influenced products such as the electronic device shown above.

2

- (b) **Explain** the implications of IPR (Intellectual Property Rights) associated with this new range of products for:

(i) the designer;

2

(ii) the client/manufacturer.

2

(6)

Total for Section B (40)

[END OF QUESTION PAPER]

ACKNOWLEDGEMENTS

Section B Question 4—Photograph of a Cegasa battery. Reproduced by kind permission of Cegasa Internacional.

Section B Question 7—Photograph of a BlackBerry. Permission is being sought from BlackBerry, Research in Motion Ltd.