

X211/12/01

NATIONAL
QUALIFICATIONS 2015

MONDAY, 25 MAY
9.00 AM – 11.00 AM

PRODUCT DESIGN
HIGHER

70 marks are allocated to this paper.



Attempt all questions

SECTION A

1. The two coat stands shown below have been designed for use in an office or domestic environment.



Cascando Tree coat stand by Robert Bronwasser

Body—lacquered MDF

Pegs—polished aluminium

Dimensions—2000 × 800 mm

Price £405

Available in white, lime green and light grey.



Classic Chrome coat stand by Tszuji

Body—chromed steel (tube)

Pegs and base—ABS polymer

Dimensions—1770 × 420 mm

Price £95.95



1. (continued)

- | | |
|---|-------------|
| (a) Write a product specification for one of the coat stands in relation to its target market. | 6 |
| (b) Justify the choice of materials and finishes used to produce both coat stands. | 6 |
| (c) Identify and justify the production processes that could be used to manufacture both coat stands. | 6 |
| (d) Describe the environmental issues associated with the manufacture and use of both coat stands. | 4 |
| (e) Describe the appeal of both coat stands from the consumer's viewpoint. | 4 |
| (f) For both coat stands, describe the quality issues that would affect: | |
| • the manufacturer; | |
| • the consumer. | 4 |
| Total for Section A | (30) |

[Turn over

SECTION B

2. The products shown below have been manufactured using thermosetting plastics.



Carbon monoxide sensor



Electrical adapter

- (a) State the name of a suitable thermosetting plastic and explain why it is appropriate for the manufacture of these components. 2
- (b) Identify **and** justify a suitable manufacturing process for products such as these. 3

(5)

3. The logos shown below are used to represent some well known high street brands.



Explain why **branding** is important for:

- (i) consumers;
- (ii) retailers.

2
2
(4)

[Turn over

4. The traditional brass door handle shown below was manufactured by sand casting.



- (a) Explain why sand casting was chosen to produce the door handle. 2
- (b) Describe the benefits of using brass in the production of the door handle for **both**:
- (i) the consumer; 1
 - (ii) the manufacturer. 1

The door handle shown below was produced by drop forging.



- (c) Describe the benefits the manufacturer would gain from using this process. 2
- (6)**

5. The innovative NEST utensils set shown below has been designed to reduce the need for storage space.



- (a) Describe **two** ways that function has influenced the aesthetics of this product. 2

Manufacturers need to evaluate the suitability of their products.

- (b) (i) Describe **two** possible product evaluation techniques. 2
(ii) Describe the type of information that would be gathered from each evaluation technique. 2

(6)

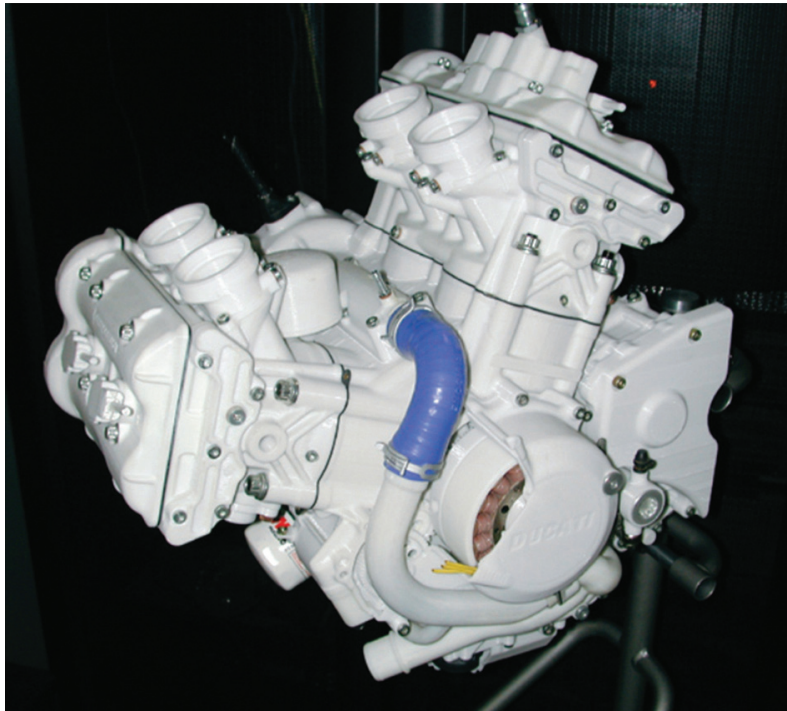
[Turn over

6. Prototypes are often used during the development of new products.

- (a) Explain why it is useful for companies to create prototypes before beginning full production.

3

Many companies use **rapid prototyping** techniques to produce functional prototypes such as the motorcycle engine shown below.

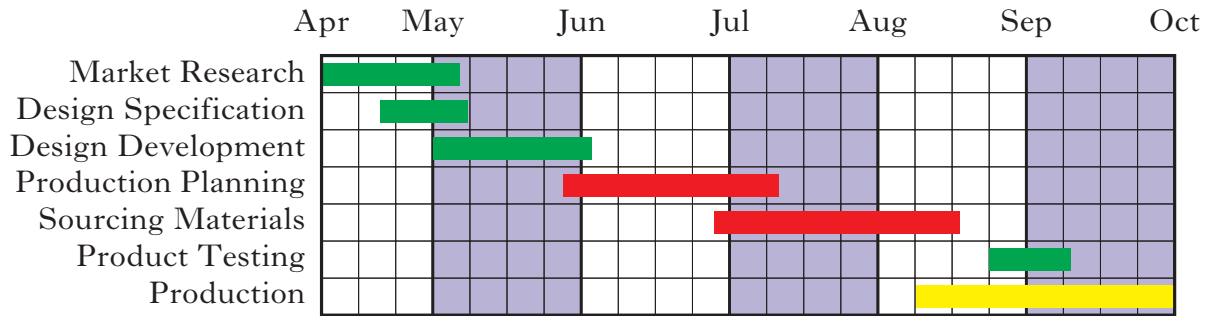


- (b) Describe the benefits that **rapid prototyping** offers when developing functional products.

3

(6)

7. The chart shown below was used by a company in the development and introduction of a new product.



(a) Describe the benefits that this chart would give to the company. 3

(b) Describe the benefits that can be gained from the overlapping of the “**Design Development**” and the “**Production Planning**” stages. 2

Market research is important in the introduction of a new product.

(c) Explain the benefits to the company of undertaking extensive Market research. 2

(7)

[Turn over for Question 8 on Page ten

8. A high performance racing bicycle is shown below.



Describe how materials, ergonomics and function have influenced the design of this type of bicycle.

(6)

Total for Section B (40)

[END OF QUESTION PAPER]

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ACKNOWLEDGEMENTS

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Question 1 – Images of Classic Chrome Coat Stand by Tszuji.

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