

# OCR

Oxford Cambridge and RSA

## Monday 15 May 2017 – Afternoon

### LEVEL 1/2 CAMBRIDGE NATIONAL AWARD/ CERTIFICATE IN ENGINEERING DESIGN

**R105/01** Design briefs, design specifications and user requirements

Candidates answer on the Question Paper.

**OCR supplied materials:**

None

**Other materials required:**

None

**Duration:** 1 hour



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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#### INSTRUCTIONS TO CANDIDATES

- Use black ink. HB pencil may be used for graphs and diagrams only.
- Complete the boxes above with your name, centre number and candidate number.
- Answer **all** the questions.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the barcodes.

#### INFORMATION FOR CANDIDATES

- The total number of marks for this paper is **60**.
- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- Dimensions are in millimetres unless stated otherwise.
- Your quality of written communication will be assessed in questions marked with an asterisk (\*).
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 Product 'Life Cycle Analysis' (LCA) is an important consideration for designers.

(a) Complete the table below by adding the LCA considerations in the correct order.

One has been done for you.

<b>Selection of raw material</b>	<b>Recycling of materials</b>
<b>Ease of disassembly</b>	<b>Energy use during operation</b>

<b>1</b>	
<b>2</b>	<b>Energy used in manufacturing</b>
<b>3</b>	
<b>4</b>	
<b>5</b>	

[4]

(b) Give **three** ways in which new and emerging materials can contribute to a product's lifecycle.

- 1 .....
- .....
- 2 .....
- .....
- 3 .....
- .....

[3]

(c) Describe how ease of disassembly can contribute to sustainable design.

- .....
- .....
- .....
- .....

[3]

2 The creation of a design brief is an important step in the identify stage of the design cycle.

(a) (i) Give **two** factors that may inform the development of a design brief.

1 .....

.....

2 .....

.....

[2]

(ii) State **one** other process carried out in the identify phase of the design cycle.

.....

..... [1]

(iii) Name **two** other phases of the design cycle.

1 .....

.....

2 .....

.....

[2]

(b) Give **two** ways in which market research can be used to update an existing product.

1 .....

.....

2 .....

.....

[2]

(c) Describe, using an example, how the function of a new product could be influenced by the target audience.

.....

.....

.....

.....

.....

[3]

3 Fig. 1 shows some children’s plastic building blocks.

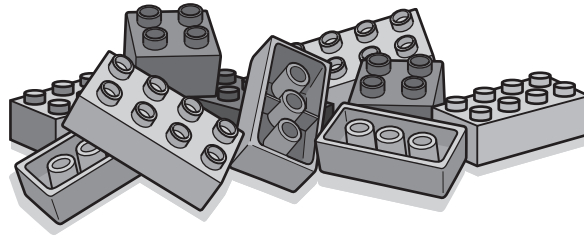


Fig. 1

(a) Give **two** safety factors that should be considered when designing the children’s building blocks.

1 .....

.....

2 .....

.....

[2]

(b) Give **two** reasons why the building blocks have been manufactured using plastic moulding.

1 .....

.....

2 .....

.....

[2]

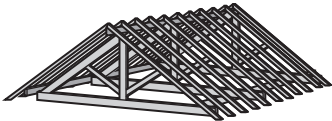
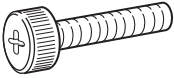

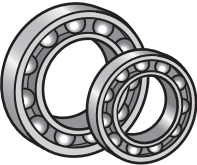

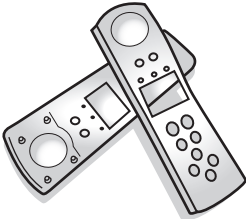


- 4 The use of both standard and of pre-manufactured components is an essential part of modern day manufacturing.

(a) The table below shows a range of standard and pre-manufactured components.

Complete the table by placing a tick (✓) in the correct column to indicate if the component is standard or pre-manufactured.

One of each has been done for you.

	Component	Component name	Standard component	Pre-manufactured component
1		Roof truss		
2		M6 Bolt	✓	
3		Car seat		✓
4		Bearing		
5		Gear		
6		Injection moulded casing		

[4]

(b) Give **three** reasons why pre-manufactured components may be used in production.

- 1 .....
  - 2 .....
  - 3 .....
- [3]**

(c) Explain why the scale of manufacture can affect the cost of production.

.....

.....

.....

.....

.....

**[3]**

5 Fig. 2 shows an electric household kettle.



Fig. 2

(a) State **two** ways the working environment has influenced the design of the kettle.

1 .....

.....

2 .....

.....

[2]

(b) Give **three** aesthetic design features that could be modified to vary the range of kettles.

1 .....

.....

2 .....

.....

3 .....

.....

[3]



(c) Designers may produce virtual or physical prototypes throughout the design development process.

(i) Give **two** methods a designer may use to produce a prototype.

1 .....

.....

2 .....

.....

[2]

(ii) Describe **three** ways that a physical prototype can be used to validate a product.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

6 Designers may take inspiration from iconic products.

(a) (i) Give **one** example of an iconic product.

..... [1]

(ii) State **two** reasons why the product you have chosen became iconic.

1 .....

.....

2 .....

..... [2]

(b) Explain why designers may use iconic products as inspiration when developing new designs.

.....  
.....  
.....  
.....  
.....  
.....  
..... [3]

(c) Explain why a designer may apply for a patent.

.....  
.....  
.....  
.....  
.....  
..... [3]

(d) State the meaning of the term 'trademark'.

..... [1]

**END OF QUESTION PAPER**

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