

**OCR**

Oxford Cambridge and RSA

**Monday 11 May 2015 – 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.
- Do **not** write in bar codes.

**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 **16** pages. Any blank pages are indicated.

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Answer **all** the questions.

1 Fig. 1 shows three examples of containers for medication.



Fig. 1

(a) Shown below are five client requirements.

Join each client requirement to the correct suggested product feature.

One has been done for you.

**Client requirement****Suggested product feature**

Prevent ultraviolet light from degrading contents	Tamper proof
Made from lightweight material	Material is translucent
Contents must be visible	PET is used for the bottle
Children must not be able to open	Chemical free surface
Labels adhere to surface	Container coloured brown

[4]

(b) As part of the design cycle, testing is performed on first prototypes.

Give **two** reasons why prototypes are tested.

1 .....

.....

2 .....

.....

[2]

(c) Error proofing can be used to optimise designs.

Explain what is meant by the term 'error proofing'.

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.....

[2]

(d) Prototype testing can lead to design changes.

Give **two** other reasons why a designer might return to a client to discuss the original design brief.

1 .....

.....

2 .....

.....

[2]

2 Fig. 2 shows two mobile phones. You have been asked for advice on design by the manufacturer of phone A.



Fig. 2

(a) (i) Give **two** strengths of the design of phone A compared with phone B.

Strength 1 .....

.....

Strength 2 .....

.....

[2]

(ii) Give **two** ergonomic requirements that must be considered when designing a mobile phone.

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..... [2]

(b) Identify **four** limitations or constraints for a manufacturer of mobile phones.

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.....  
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.....  
.....  
..... [4]

(c) Companies use market research to target specific audiences.

Give **two** methods of collecting information about target groups for their products.

1 .....  
.....  
2 .....  
..... [2]

3 Fig. 3 shows a microwave oven.

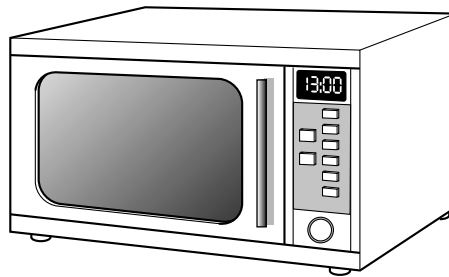


Fig. 3

(a) Explain how each of the following would have to be considered when designing a microwave oven.

(i) Size

.....  
.....  
.....  
..... [2]

(ii) Life cycle

.....  
.....  
.....  
..... [2]

(iii) Working environment

.....  
.....  
.....  
..... [2]

(b) Give **two** anthropometric data measurements that would be used in the design of the handle of the microwave oven.

1 .....

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2 .....

.....

[2]

(c) Give **two** reasons why microwave ovens might be produced in a range of specifications.

1 .....

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2 .....

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[2]

4 Fig. 4 shows an exploded view of a 13 Amp plug.

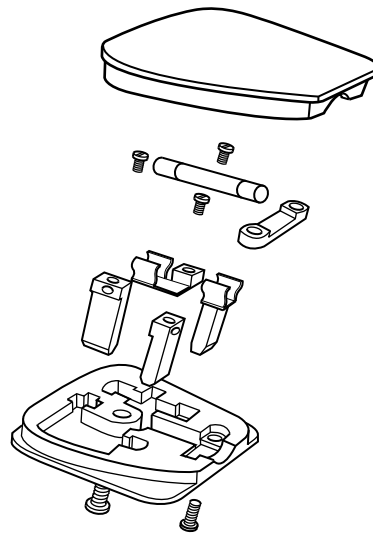


Fig. 4

(a) State **two** standard components used in the 13 Amp plug.

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..... [2]

(b) State **two** features of the 13 Amp plug shown in Fig. 4 that makes disassembly and maintenance easy for the user.

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..... [2]

(c) Describe why the parts of the 13 Amp plug are manufactured to close tolerances.

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..... [2]



(d) Explain the benefits to a manufacturer of using standard components in the assembly of products.

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5 (a) Explain how the design of new products is influenced by market pull and technological push.

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..... [4]

(b) Explain how each of the following safeguards can be used by companies to protect their products.

(i) Registered designs

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..... [2]

(ii) Trademarks

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.....  
..... [2]

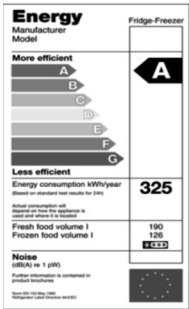
(iii) Patents

.....  
.....  
.....  
..... [2]

6 (a) Manufacturers are required to label certain products with specific signs and symbols. Give one reason why each symbol shown below would be labelled on a product.



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 ..... [1]



.....  
 ..... [1]

(b) Describe how developments in materials impact upon the design and manufacture of products.

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 ..... [2]

(c)\* Discuss the effect of cultural and fashion trends on the aesthetic design of new products.

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[6]

END OF QUESTION PAPER

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