



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.

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.

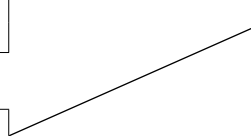
One has been done for you.

Client requirement

- Prevent ultraviolet light from degrading contents
- Made from lightweight material
- Contents must be visible
- Children must not be able to open
- Labels adhere to surface

Suggested product feature

- Tamper proof
- Material is translucent
- PET is used for the bottle
- Chemical free 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

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2

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[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

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[2]

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

.....

.....

.....

..... [2]

3 Fig. 3 shows a microwave oven.

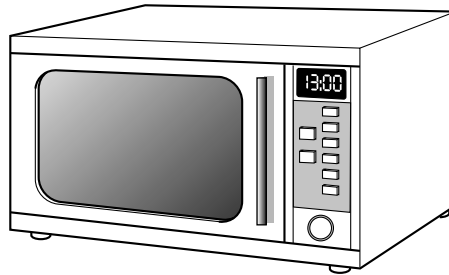


Fig. 3

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

(i) Size

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

(ii) Life cycle

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

(iii) Working environment

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.....
..... [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.

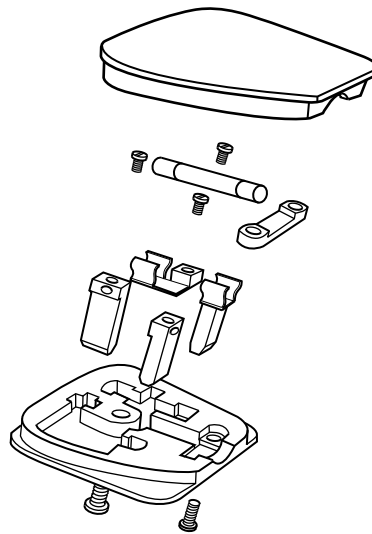


Fig. 4

(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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..... [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]

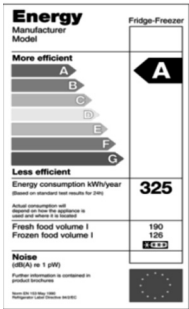
(iii) Patents

.....
.....
.....
..... [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.

.....

 [2]

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