

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
LEVEL 1/2**

R105/01

**CAMBRIDGE NATIONAL AWARD/
CERTIFICATE IN ENGINEERING DESIGN**

**Design briefs, design specifications
and user requirements**

MONDAY 11 MAY 2015: Afternoon

**DURATION: 1 hour
plus your additional time allowance**

MODIFIED ENLARGED

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

None

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

Use black ink. HB pencil may be used for graphs and diagrams only.

Complete the boxes on the first page with your name, centre number and candidate number.

Answer ALL the questions.

Write your answer to each question in the space provided.

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 (*).

Any blank pages are indicated.

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Answer ALL the questions.

- 1 (a) Shown below are five client requirements for medication containers.**

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'.

[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

Phone A



Phone B



- (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.

[2]

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

[4]

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

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

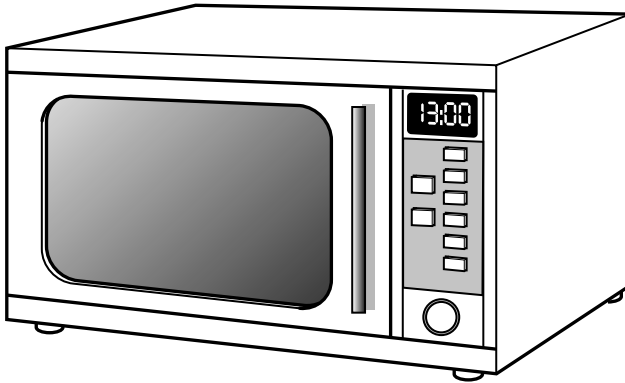
1 _____

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

2

[2]

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

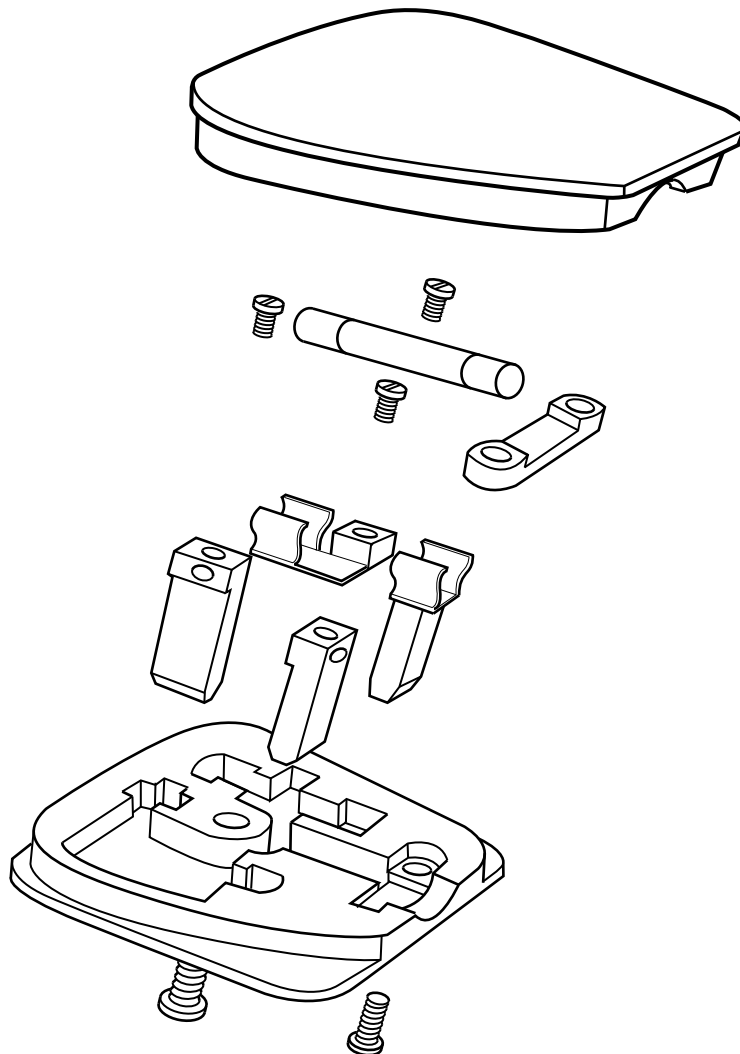
1

2

[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.

[2]

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

[2]

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

[2]

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

[4]

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

[4]

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

(i) Registered designs

[2]

(ii) Trademarks

[2]

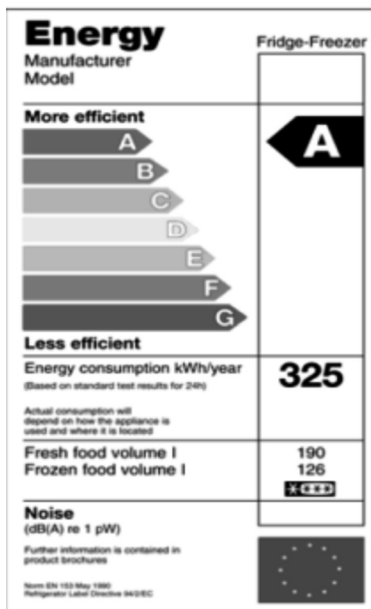
(iii) Patents

[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.



[1]



[1]

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

[2]

[illegible]

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