



Oxford Cambridge and RSA

Wednesday 22 May 2019 – Morning

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

R105/01 Design briefs, design specifications and user requirements

Time allowed: 1 hour



Candidates answer on the Question Paper.

OCR supplied materials:

None

Other materials required:

None



Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

Candidate number

First name(s) _____

Last name _____

INSTRUCTIONS

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

INFORMATION

- 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 Fig. 1 shows an example of a smart watch.



Fig. 1

- (a) Shown below are five requirements that inform the purpose of the product.

Join each of these requirements with the correct product feature.

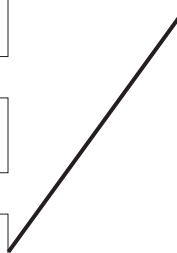
One has been done for you.

Purpose of the product

- Be a wearable message receiver
- Act as a fitness monitor
- Be an accurate time piece
- Be a personal navigation assistant
- Process contactless payments

Suggested product feature

- Digital clock
- Heart rate sensor
- NFC chip
- Cellular data
- GPS technology



[4]

(b) State **three** pieces of information that designers could gather to help define the purpose of a product.

1

.....

2

.....

3

.....

[3]

(c) Explain why it is important for designers to define the purpose of a product before commencing the design.

.....

.....

.....

.....

.....

..... [3]

2 Fig. 2 shows a travel case.



Fig. 2

(a) State how each of the following limitations and constraints have impacted on the design of the travel case.

(i) Weight

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

(ii) Size

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

(iii) Ergonomics

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

(b) Give **one** way the designer could change the 'aesthetics' of the travel case.

..... [1]

(c) Explain how the designer has considered the working environment in the design of the travel case.

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

Question 3 begins on page 6

3 Product safety is a critical consideration for designers when developing new products.

(a) Draw **two** symbols from the list below that could be included on a product.

- British Toy and Hobby Association Lion Mark
- Age restriction logo
- CE mark
- Highly Flammable

Symbol 1	
Symbol 2	

[2]

(b) Give **two** reasons why product safety is an important consideration for designers.

1

.....

2

.....

[2]

(c)* Discuss the difference between market pull and technological push.

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[6]

4 The table below contains various points that would be included in a design specification.

(a) Complete the table by adding **four** other points that could be included in a design specification.

1	Aesthetics
2	Ergonomics
3	
4	Limitations and constraints, size, weight, functional limitations
5	
6	Product safety
7	
8	Maintenance
9	
10	British Standards

[4]

(b) Explain why a designer must define a design specification before manufacturing a design.

.....

.....

.....

..... [3]

(c) State **three** areas that would be considered during a Life Cycle Analysis (LCA).

1

.....

2

.....

3

.....

[3]

5 Process planning is an important part of the development of new products.

(a) (i) State which phase of the design cycle includes process planning.

..... [1]

(ii) Give **two** reasons why designers would carry out process planning during this stage of the design cycle.

1

.....

2

.....

[2]

(b) The situation and context are important factors when developing a design brief.

State the meaning of the following terms when considering the development of a design brief.

(i) Situation

.....

..... [2]

(ii) Context

.....

..... [2]

(c) Describe how designers may use inspirational and iconic products to inform the development of a new design.

.....

.....

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..... [3]

6 Fig. 3 shows a vacuum cleaner.

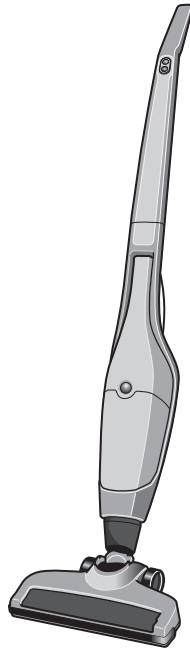


Fig. 3

(a) State **three** ways that the vacuum cleaner in Fig. 3 could be designed for maintenance.

- 1
 - 2
 - 3
- [3]

(b) Explain how maintenance can contribute to sustainable design.

-
 -
 -
- [3]

(c) New production processes can impact on the design of new products.

(i) Give **one** example of a new production process.

..... [1]

(ii) Give **three** advantages of the new production process in your example given to part (i).

1

.....

2

.....

3

.....

[3]

END OF QUESTION PAPER

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