OCR
Oxford Cambridge and RSA

Tuesday 12 January 2021 – Morning

Level 1/2 Cambridge National in Engineering Design

R105/01 Design briefs, design specifications and user requirements

Time allowed: 1 hour

8367813326

No extra materials are needed.

R 1 0 5 0 1

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. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- Answer **all** the questions.

INFORMATION
- The total mark for this paper is **60**.
- The marks for each question are shown in brackets **[ ]**.
- Quality of written communication will be assessed in questions marked with an asterisk (*).
- This document has **12** pages.

ADVICE
- Read each question carefully before you start your answer.

Answer **all** the questions.

1 Designers need to consider design for disassembly when developing new products.

(a) The table below shows a range of fixing methods.

Complete the table by placing a tick (✓) in the correct column to indicate if the fixing method makes disassembly easier or not.

One has been done for you.

Fixing method	Helps disassembly	Does not help disassembly
Welding		
Screws		
Adhesive/glue		
Nut and bolt with washer		
Rivets		✓

[4]

(b) Give **two** advantages of designing products for disassembly.

1 .....

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2 .....

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[2]

(c) Explain why design for disassembly should be considered in a Life Cycle Analysis (LCA).

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

2 Iconic products can influence the development of new designs.

(a) (i) Name **three** iconic products.

1 .....

2 .....

3 .....

[3]

(ii) Give **two** reasons why products can become iconic.

1 .....

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2 .....

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[2]

(b) (i) Designers and companies want to protect (safeguard) iconic designs using copyright.

Draw the copyright symbol in the space below.

[1]

(ii) State **one** other method of protecting a design.

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

(c) Explain why protecting a design is an advantage for a company.

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

3 **(a)** Standard components can be used when manufacturing products. Name **three** standard components.

1 .....

2 .....

3 .....

[3]

(b) Give **two** reasons why standard components can help control the budget for a new product.

1 .....

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2 .....

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[2]

(c) State **one** other way of controlling the budget when manufacturing a new product.

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

(d) Explain why it is important to discuss the budget with the client when developing a design brief.

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

4 Fig. 1 shows a bicycle helmet.

Fig. 1

(a) Explain how each of the following user needs has been considered in the design of the bicycle helmet.

(i) Aesthetics

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

(ii) Product safety

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

(b)* Discuss the relationship between a design brief and a design specification.

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..... **[6]**

5 Fig. 2 shows a backpack.

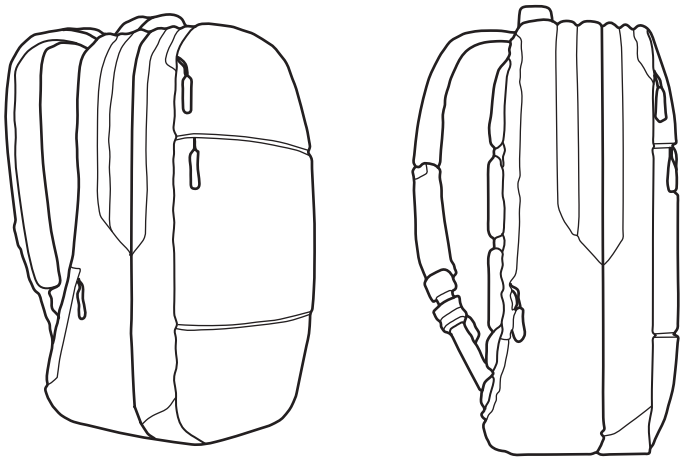

Fig. 2

(a) Give **two** ways the designer could change the appearance of the backpack.

1 .....

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2 .....

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

(b) Describe how cultural and fashion trends may influence the design of the backpack.

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

(c) Complete the statements below with the correct **two** terms:

(i) Designers will try to ensure their products are comfortable to use and that the user can interact with them effectively. This is called ..... **[1]**

(ii) Designers may also use measurements of the human body to help with their design. These measurements are referred to as ..... **[1]**

(d) Explain why designers may have assessed the strengths and weaknesses of competitors' products when designing the backpack.

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

6 Sustainable design is a consideration of designers when developing new products.

(a) For each of the products below, explain one feature that makes it sustainable.

(i) Reusable shopping bag

Fig. 3

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

(ii) Electric car

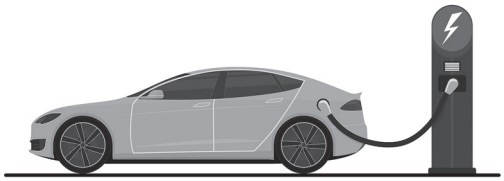

Fig. 4

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

(iii) LED lamp

Fig. 5

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

(b) Explain how companies can ensure manufacturing is sustainable.

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

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE