

Modified Enlarged 18pt

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

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
plus your additional time allowance**

No extra materials are needed.

Please write clearly in black ink.

Centre number

--	--	--	--	--

Candidate number

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First name(s) _____

Last name _____

READ INSTRUCTIONS OVERLEAF



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 (*).

ADVICE

Read each question carefully before you start your answer.

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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. [4]

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

(b) Give TWO advantages of designing products for disassembly.

1 _____

2 _____

[2]

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

[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 _____

2 _____

[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.

[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 _____

2 _____

[2]

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

[1]

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

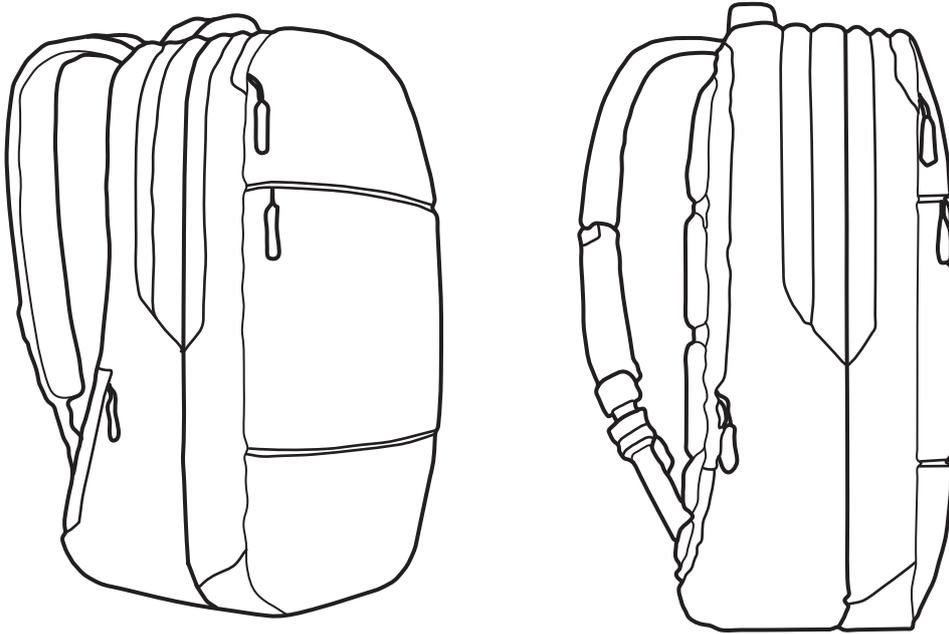
[2]

(ii) Product safety

[2]

5 Fig. 2 shows a backpack.

FIG. 2



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

1 _____

2 _____

[2]

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

[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.

[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

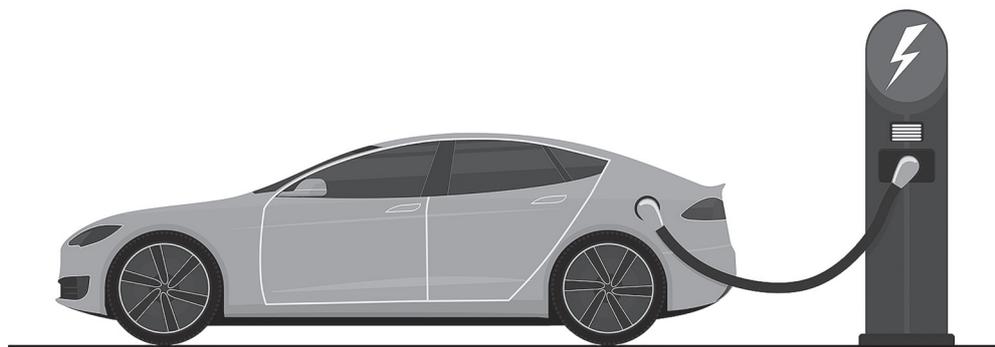
FIG. 3



[2]

(ii) Electric car

FIG. 4



[2]

(iii) LED lamp

FIG. 5



[2]

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