Modified Enlarged 24pt

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Monday 16 May 2022 – 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 | | | | |

First name(s) _____

Last name _____

READ INSTRUCTIONS OVERLEAF

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DC (PQ/SW) 317639/1

1152326292

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 Composite materials are becoming more common in manufacturing.

(a) The table below shows a range of materials.

(i) Complete the table by placing a tick (✓) in the correct column to indicate if the material is a composite, or is NOT a composite.

One of each has been done for you. [4]

	Material name	Composite	Not a composite
1	Aluminium		✓
2	Carbon Fibre		
3	Concrete	✓	
4	Copper		
5	Fibre glass		
6	MDF		

(ii) State what is meant by the term ‘composite’.

_____

_____ [2]

(b) (i) **Some materials are more difficult to process than others. Give TWO reasons why this could affect the budget.**

1 _____

2 _____

[2]

(ii) **Name TWO other factors that can affect the overall budget for developing a new product.**

1 _____

2 _____

[2]

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2 Designers use a range of information alongside market research to inform the development of design briefs.

(a) Give TWO pieces of information other than market research that may inform a design brief.

1 _____

2 _____

[2]

(b) Complete the TWO terms below to describe market forces for new products.

(i) _____ **pull** **[1]**

(ii) Technological _____

[1]

(c) State TWO types of market research that can be used to identify design needs.

1 _____

2 _____

[2]

(d) **Explain why designers undertake market research.**

_____

_____

_____

_____

_____

_____

_____

_____ **[4]**

3 (a) State TWO ways the design of a thermos flask has considered product safety.

1 _____

2 _____

[2]

FIG. 1 shows two safety symbols used on some electrical products.

FIG. 1

(b) Name TWO other safety symbols displayed on products.

1 _____

2 _____

[2]

(c) **Describe how designers can ensure the product is safe to use.**

_____

_____

_____

_____ **[2]**

(d) **Explain why product safety can contribute to the success of a new product.**

_____

_____

_____

_____

_____

_____

_____ **[4]**

4 Bread is an example of a product made through 'batch production'.

(a) (i) Give ONE advantage of batch production.

_____ **[1]**

(ii) Give ONE disadvantage of batch production.

_____ **[1]**

(b) State why the scale of production can influence the manufacturing process used.

_____

_____ **[2]**

(c)* Discuss how just-in-time production is used in manufacturing. [6]

_____

_____

_____

5 Designers create a range of ideas when developing designs for new products.

(a) Give TWO reasons why designers develop a range of design ideas.

1 _____

2 _____

[2]

(b) State ONE format, other than engineering drawings, designers can use to present their final designs.

_____ **[1]**

(c) State THREE features of an engineering drawing that assist with manufacture.

1 _____

2 _____

3 _____

[3]

(d) **Explain how the features of engineering drawings improve the quality of a final product.**

_____

_____

_____

_____

_____

_____

_____

_____ **[4]**

6 Renewable energy sources can contribute to sustainable design.

(a) (i) Name TWO renewable energy sources.

1 _____

2 _____

[2]

(ii) Name TWO non-renewable energy sources.

1 _____

2 _____

[2]

(b) Give TWO advantages of using renewable energy sources.

1 _____

2 _____

[2]

(c) **Explain how sustainability considerations can impact on the design of a new product.**

_____

_____

_____

_____

_____

_____

_____

_____ **[4]**

END OF QUESTION PAPER

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