



Oxford Cambridge and RSA

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



No extra materials are needed.



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 **8** pages.

ADVICE

- Read each question carefully before you start your answer.

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.

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

[4]

(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]

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.

.....

.....

.....

.....

.....

.....

.....

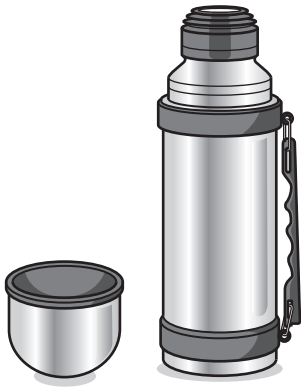
.....

.....

..... [4]

3 Fig. 1 shows a thermos flask.

Fig. 1



(a) State **two** ways the design of the flask has considered product safety.

- 1
 - 2
- [2]

Fig. 2 shows two safety symbols used on some electrical products.

Fig. 2



(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]

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



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series. If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of Cambridge University Press & Assessment, which is itself a department of the University of Cambridge.