

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
LEVEL 1/2
R105/01
CAMBRIDGE NATIONAL AWARD/
CERTIFICATE IN ENGINEERING DESIGN
Design briefs, design specifications
and user requirements
WEDNESDAY 10 JANUARY 2018: Morning
DURATION: 1 hour
plus your additional time allowance
MODIFIED ENLARGED 24pt**

Candidate forename						Candidate surname				
Centre number						Candidate number				

Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

None

READ INSTRUCTIONS OVERLEAF



INSTRUCTIONS TO CANDIDATES

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

Complete the boxes on the front page with your name, centre number and candidate number.

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 FOR CANDIDATES

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.

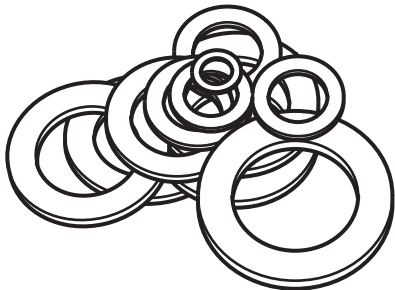
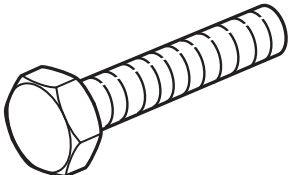
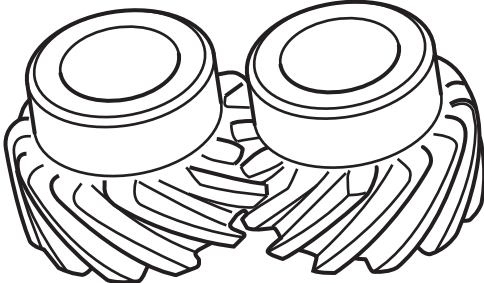
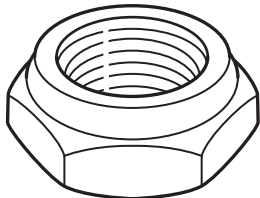
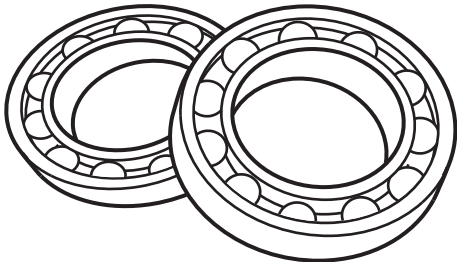
Your quality of written communication will be assessed in questions marked with an asterisk (*).

Answer ALL the questions.

1 The table below shows five standard components.

(a) (i) Complete the table by naming the standard components.

One has been done for you. [4]

	Component image	Component name
1		
2		M8 Hex Head Bolt
3		
4		
5		

(ii) Name ONE other standard component.

_____ [1]

(b) Give TWO reasons why designers would use standard components in the development of new products.

1 _____

2 _____

[2]

(c) Explain how standard components can improve the sustainability of new products.

[3]

2 Regulations and safeguards are an important consideration for designers and manufacturers.

(a) Give TWO reasons why regulations and safeguards are important when developing new products.

1 _____

2 _____

_____ **[2]**

(b) (i) Draw the symbol for the ‘European Conformity’ mark below. [1]

(ii) State TWO other examples of symbols that may be included on a product.

1 _____

2 _____

[2]

(c) State what is meant by the term ‘registered’ design.

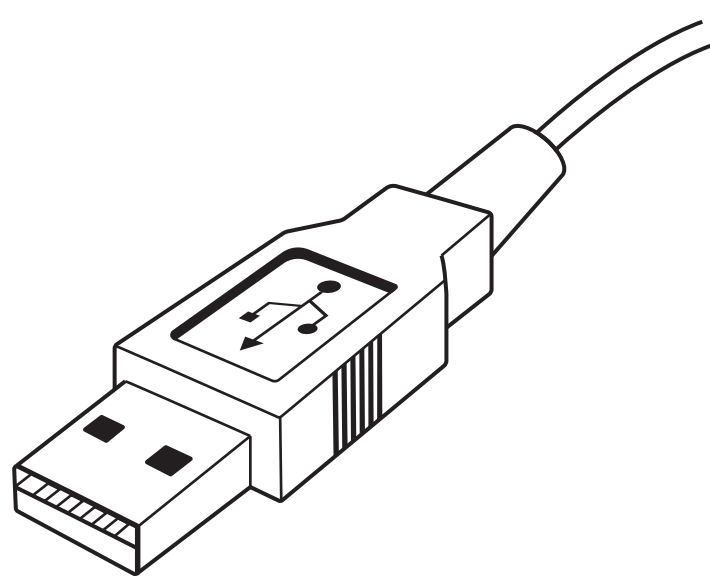
[2]

(d) Explain the difference between a registered design and a patent.

[3]

3 Fig. 1 shows an image of a USB cable plug.

FIG. 1



(a) Explain how the USB plug has been designed with consideration of error proofing.

[3]

(b) State which phase of the design cycle would include testing of a product.

[1]

(c) State THREE considerations that a designer could include in a manufacturing plan for a new product.

1 _____

2 _____

3 _____

[3]

(d) Explain why designers may validate a design before final production commences.

[3]

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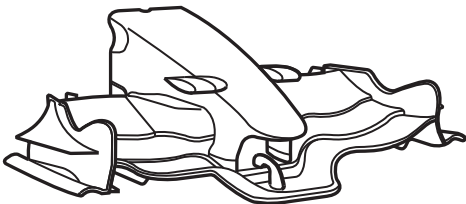
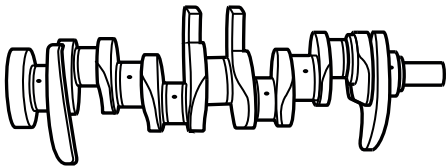
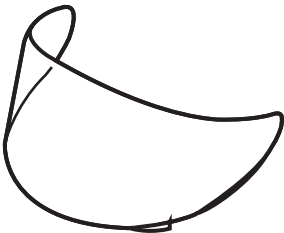
- 4 The table below shows a range of different products and the material they are made from.
- (a) Complete the table below by adding the most appropriate function:
- Lightweight and strong**

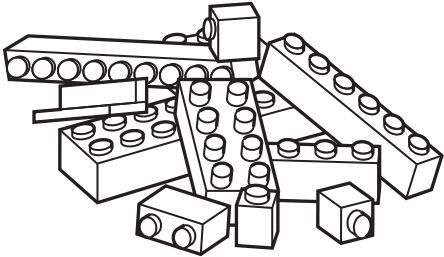
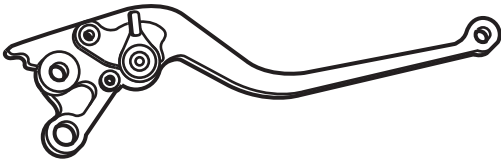
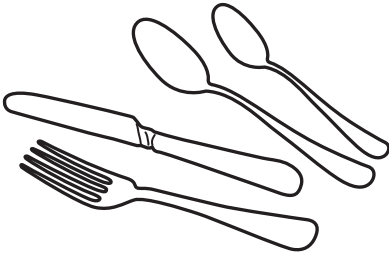
Forged and hardened to resist wear

Hygienic and resistant to corrosion

Non-toxic and easy to mould

Impact resistant and transparent
- One has been done for you. [5]

	Product	Material	Function
1	Formula 1 Front Wing 	Carbon fibre	
2	Engine Crankshaft 	Cast alloy steel	
3	Motorcycle Helmet Visor 	Polycarbonate	

4	Building Blocks 	ABS	
5	High-performance Bicycle Brake Lever 	Aluminium billet	Lightweight metal, easy to machine
6	Cutlery 	Stainless steel	

(b) State TWO reasons why manufacturers should consider the supply chain during the development of a new product.

1 _____

2 _____

[2]

(c) Explain why the availability of a material might have an impact on the design of a new product.

[3]

5 The sustainability of new products is an important consideration for engineering designers.

(a) (i) Explain what is meant by the term ‘sustainable design.’

[3]

(ii) Give TWO ways that designers can improve the sustainability of products.

1

2

[2]

(b) State TWO environmental pressures that designers should consider when developing new products.

1

2

[2]

[3]

(a) (i) State TWO different scales of production.

1 _____

2 _____

[2]

1 _____

2 _____

[2]

[illegible]

END OF QUESTION PAPER

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