Write your name here

Surname	Other names

Pearson
Edexcel GCE

Centre Number | | | | | |

Candidate Number | | | | |

Design and Technology

Product Design: Graphic Products
Advanced Subsidiary
Unit 2: Design and Technology in Practice

Wednesday 14 May 2014 – Morning
Time: 1 hour 30 minutes

Paper Reference
6GR02/01

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches it must be dark (HB or B). Coloured pens, pencils and highlighter pens must not be used.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 70.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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1/1/1/1/1/1/1

P 4 3 3 7 3 A 0 1 2 0

PEARSON

Answer ALL questions. Write your answers in the spaces provided.

1 Figure 1 shows a prototype menu holder made of acrylic with a card menu insert.

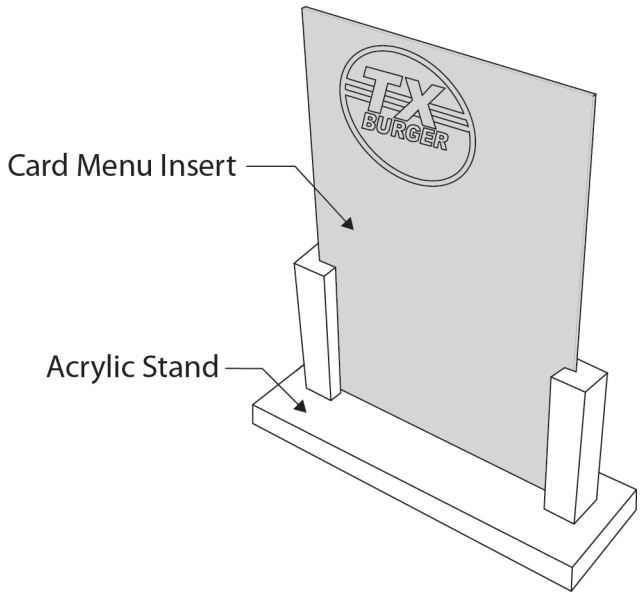

Figure 1

(a) Give **one** aesthetic and **one** functional reason why acrylic is used for the menu holder.

(2)

Aesthetic

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Functional

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(b) The acrylic used for the menu holder has been laser cut. Laser cutting is a fast method of production.

Give **two** other advantages of laser cutting over traditional cutting methods.

(2)

1 .....

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2 .....

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(c) The card menu insert is finished using a process called encapsulation.

Explain **one** disadvantage of encapsulation.

(2)

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(d) Acrylic cement is used in a school to join pieces of the menu holder.

Complete the risk assessment table below.

Hazard	Risk	People at Risk	Control Measure
Using acrylic cement	**Inhalation of vapours**	**User**	**(1)**
			(1)
	Unsafe storage	**Students/ staff**	**(1)**
			(1)

(e) Computer-aided inspection uses a co-ordinate measuring machine (CMM) to ensure dimensional accuracy of products during production.

Outline the main features of a CMM.

(2)

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(Total for Question 1 = 12 marks)

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2 Figure 2 shows an orthographic drawing of a prototype toy racing car.

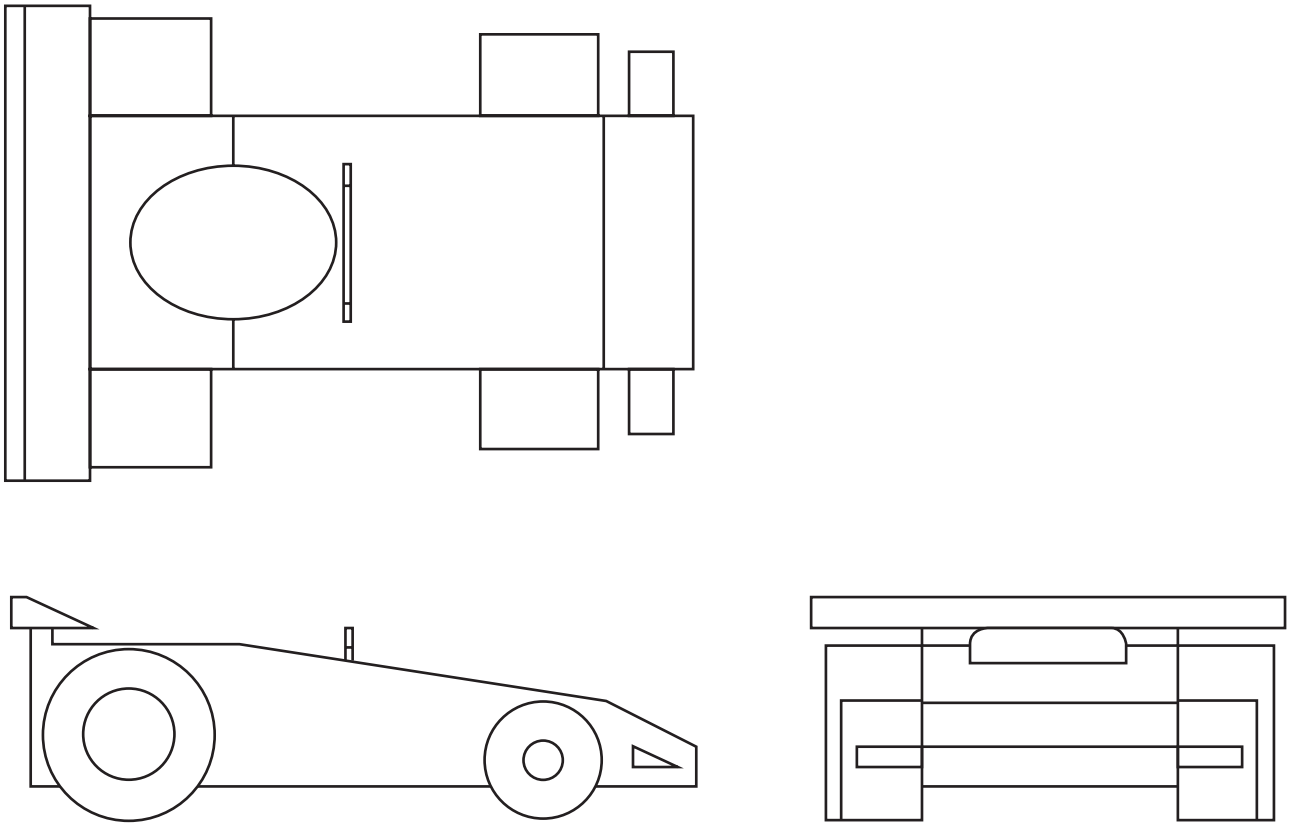

Figure 2

(a) In the space below, draw an isometric pictorial drawing of the toy racing car shown in Figure 2.

(5)

(b) The designer will model the prototype toy using balsa wood.

Explain why balsa wood is a suitable material for modelling the prototype toy.

(2)

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(Total for Question 2 = 7 marks)

3 Figure 3 shows a gift set consisting of three perfect bound paperback books and a printed solid white board slipcase.

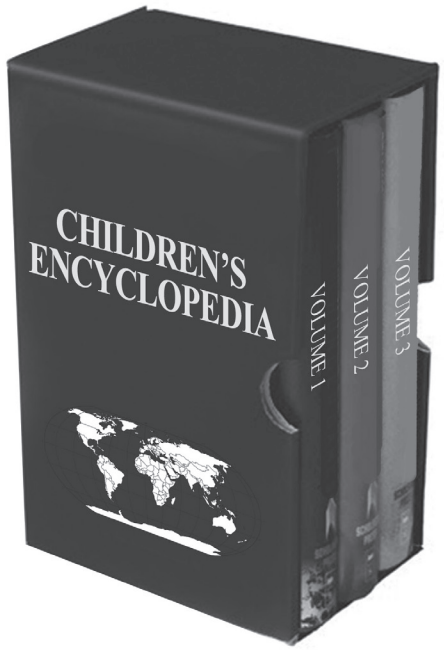

Figure 3

(a) State **two** properties that make solid white board a suitable material for the slipcase.

(2)

1 .....

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2 .....

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(b) The paperback books are printed in batches.

Explain **one** reason why books are batch produced.

(2)

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(c) Explain **two** disadvantages of perfect binding.

(4)

1 .....

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2 .....

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(d) The paperback book is fitted with a passive transponder radio frequency identification (RFID) tag.

Discuss how passive transponder RFIDs can benefit the retailer.

(3)

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(e) Continuous quality control (QC) checks are made throughout the production of the printed solid white board slipcase.

Complete the table below by stating **one** quality control check for each stage of production of the printed solid white board slipcase.

Manufacturing stage	Quality control check
Preparation of materials	**(1)**
Printing/production	**(1)**
Folding/assembly	**(1)**

(Total for Question 3 = 14 marks)

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4 Figure 4 shows a musical birthday card.

Figure 4

(a) The card has been created using desktop publishing (DTP).

Explain **two** advantages of using desktop publishing.

(4)

1 .....

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2 .....

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(b) The musical birthday card uses a piezoelectric actuator device to make the musical sound.

Describe how piezoelectric actuators work.

(3)

(c) Birthday cards can be manufactured using smart ink.

Describe, using annotated sketches, how images are produced using smart ink.

(4)

(Total for Question 4 = 11 marks)

5 Figure 5 shows a mass produced blow moulded polymer bottle.

Figure 5

(a) Blow moulding is used for the production of the polymer bottle.

(i) Explain how the bottle shape is produced from the parison.

(2)

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(ii) Explain why the mould is cooled.

(2)

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(b) Hot foil blocking is used to enhance the label on the bottle.

Describe, using annotated sketches, the hot foil blocking process.

(4)

(c) Polymers are widely used in packaging.

Evaluate the use of polymers for packaging.

(6)

(Total for Question 5 = 14 marks)

***6** Figure 6 shows an MDF jewellery presentation box.

Figure 6

(a) Explain **three** reasons why MDF is a suitable material for the presentation box.

(6)

(b) Evaluate how rapid prototyping using CAD/CAM assists the designer in the development of a product.

(6)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 70 MARKS

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