Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Design and Technology: Graphic Products

Unit 2: Knowledge and Understanding of Graphic Products

Friday 11 June 2010 – Afternoon
Time: 1 hour 30 minutes

Paper Reference
5GR02/01

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 80.
- 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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H 3 7 0 6 9 A 0 1 2 0

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Answer ALL the questions.

For each question 1 to 10, choose an answer A, B, C or D. Put a cross in the box indicating the answer you have chosen ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 What does the term DTP stand for when using a computer to design a printed product?

☒ **A** Desk-top publishing

☒ **B** Design-to-print

☒ **C** Disk transfer protocol

☒ **D** Design technical performance

(Total for Question 1 = 1 mark)

2 Which **one** of the following metals is a ferrous metal?

☒ **A** Aluminium

☒ **B** Steel

☒ **C** Tin

☒ **D** Copper

(Total for Question 2 = 1 mark)

3 A teacher needs 30 copies of a worksheet for her class.

Which **one** of the following printing processes would be the most suitable for the worksheet?

☒ **A** Screenprinting

☒ **B** Flexography

☒ **C** Offset lithography

☒ **D** Photocopying

(Total for Question 3 = 1 mark)

4 A new sign for the front of a shop is required and it must last for at least 5 years.

Which **one** of the following would **not** be a suitable material for making the sign?

☒ **A** Acrylic

☒ **B** Aluminium

☒ **C** Styrofoam™

☒ **D** Steel

(Total for Question 4 = 1 mark)

5 Which **one** of the following adhesives would be the most suitable for joining two pieces of pine?

☒ **A** Epoxy resin

☒ **B** Polystyrene cement

☒ **C** Tensol™ cement

☒ **D** Polyvinyl acetate (PVA)

(Total for Question 5 = 1 mark)

6 A relatively inexpensive and impact resistant board is needed to package a TV.

The most suitable type of board would be:

☒ **A** folding boxboard

☒ **B** corrugated board

☒ **C** solid white board

☒ **D** foil-lined board

(Total for Question 6 = 1 mark)

7 Which **one** of the following processes would be suitable for the batch production of a yoghurt pot?

☒ **A** Laminating

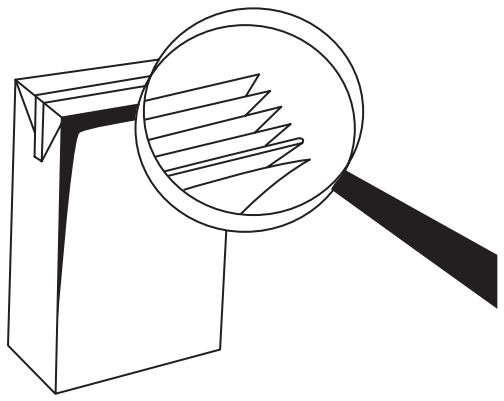
☒ **B** Line bending

☒ **C** Vacuum forming

☒ **D** Hot-foil blocking

(Total for Question 7 = 1 mark)

8 The Tetra Pak™ juice carton below is made from a packaging laminate.



Which **one** of the following materials does **not** appear in a packaging laminate?

☒ **A** Polythene

☒ **B** Aluminium

☒ **C** Acrylic

☒ **D** Paperboard

(Total for Question 8 = 1 mark)

9 Which **one** of the following best describes the 'function' of a product?

☒ **A** A product's shape and style

☒ **B** A product's purpose

☒ **C** A product's cost

☒ **D** A product's environmental friendliness

(Total for Question 9 = 1 mark)

10 A photovoltaic cell converts one type of energy into another.

Which **one** of the following energy conversions happens in a photovoltaic cell?

☒ **A** The conversion of solar energy into geothermal energy

☒ **B** The conversion of electrical energy into solar energy

☒ **C** The conversion of wind energy into solar energy

☒ **D** The conversion of solar energy into electrical energy

(Total for Question 10 = 1 mark)

11 (a) The table below shows some tools and equipment.

Complete the table below by giving the missing names and uses.

Tools/Equipment	Name	Use
	Drawing board	**(1)**
	Compass	**(1)**
	**(1)**	Bending acrylic sheet
	**(1)**	Binding documents

(b) The picture below shows a mass produced computer games controller.

(i) Give **two** reasons for using the injection moulding process to manufacture the casing for the computer games controller.

(2)

1 .....

2 .....

(ii) The casing is made from rigid polystyrene (PS).

Give **one** property of rigid polystyrene that makes it suitable for the manufacture of the casing.

For your chosen property, give **one** reason for your answer.

(2)

Property

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Reason

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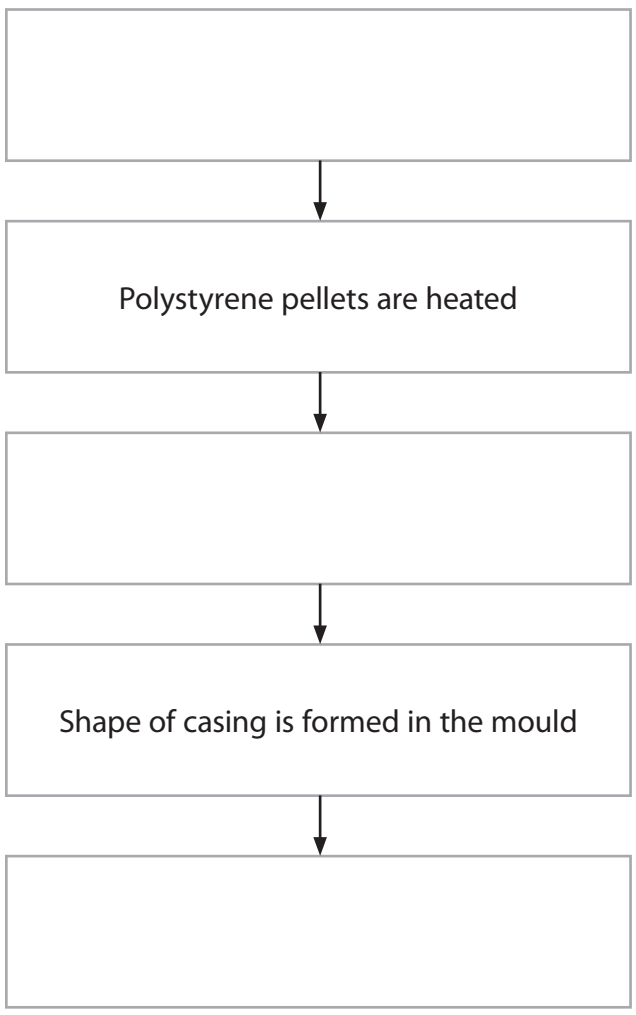
(iii) Complete the diagram below to show the main stages in producing the casing of the computer games controller using the injection moulding process.

Some of the stages have been done for you.

(3)



(iv) Name the printing process used to print the logo directly onto the rigid polystyrene casing.

(1)

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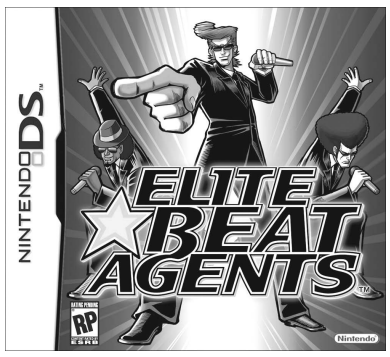
.....

(c) The picture below shows the cover of a mass produced computer game.

The cover is printed in full colour using the offset lithography process.



(i) Explain **two** reasons why the cover is printed using offset lithography.

(4)

1 .....

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2 .....

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(ii) Parts of the computer game's cover use hot-foil blocking as a finishing technique.

Outline the advantages and disadvantages of using hot-foil blocking on the cover.

(3)

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(Total for Question 11 = 19 marks)

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Turn over for question 12

12 A manufacturer requires a menu holder to display A4 sized menus and business cards for a seaside surfer's café.

The menu holder will be placed on each of the tables in the café.

The drawing below shows the name and logo for the café.

The specification for the menu holder is that it should:

- be freestanding
- hold at least six A4 menus
- hold at least twelve business cards
- allow customers to remove the menus and business cards easily
- display the name and logo of the cafe when filled with menus and business cards
- have a seaside/surf theme
- be manufactured using appropriate materials
- be manufactured using processes suitable for batch production.

In the spaces opposite, use sketches and, where appropriate, brief notes to show **two different** design ideas for the menu holder that meet the specification points above.

Candidates are reminded that if a pencil is used for diagrams/sketches it must be dark (HB or B).

Coloured pens, pencils and highlighter pens must **not** be used.

PLEASE DO NOT WRITE OR DRAW IN THIS SPACE.

PLEASE USE THE SPACES OPPOSITE FOR YOUR DESIGNS.

Design Idea 1

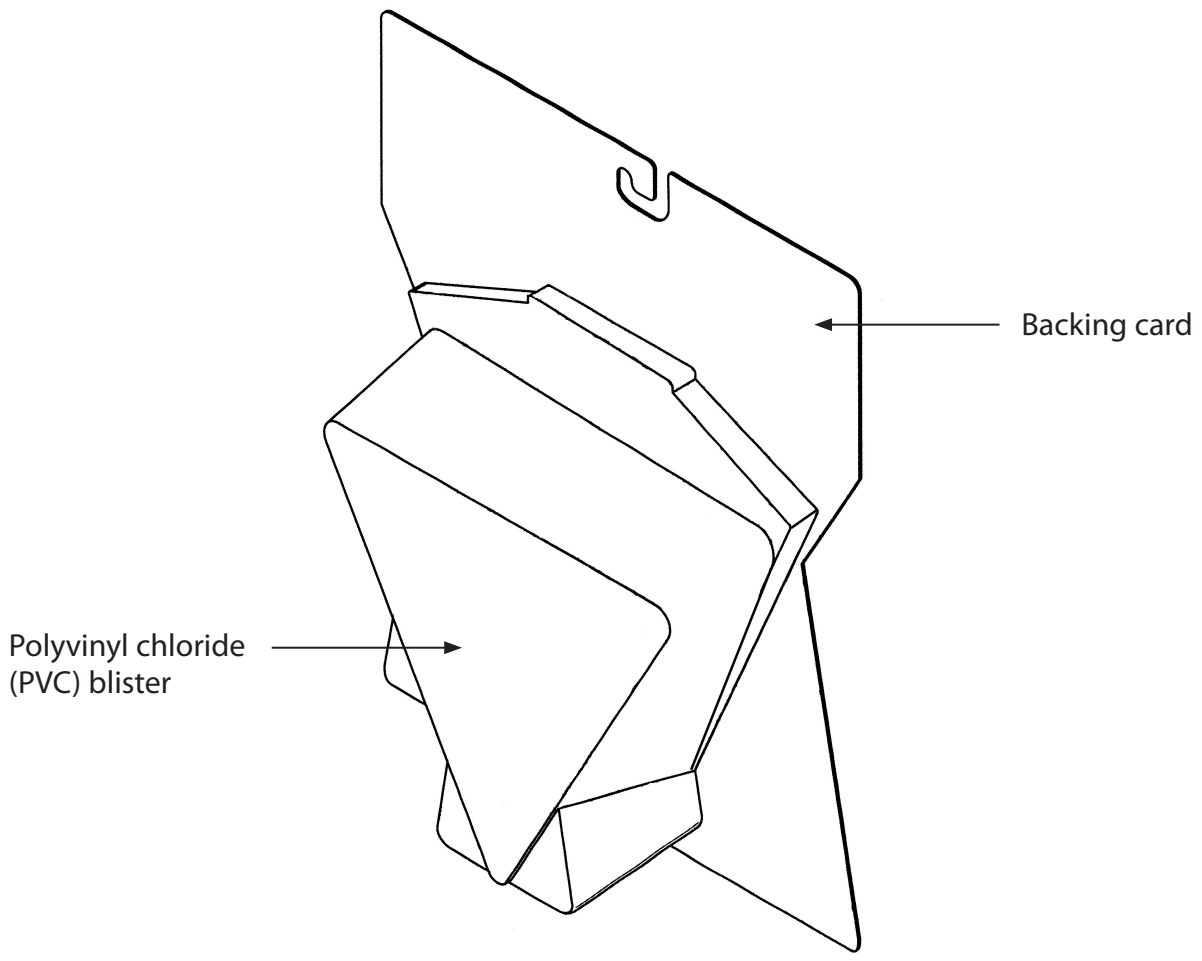
(8)

Design Idea 2

(8)

(Total for Question 12 = 16 marks)

13 The drawing below shows a blister pack for a toy.



(a) Give **two** properties of polyvinyl chloride (PVC) that make it a suitable material for blister packaging.

For each property, justify your answer.

(4)

Property 1

Justification

Property 2

Justification

(b) Explain **one** reason why the vacuum forming process is suitable for manufacturing the PVC blister.

(2)

(c) Explain why the blister packaging is successful at meeting the following specification points:

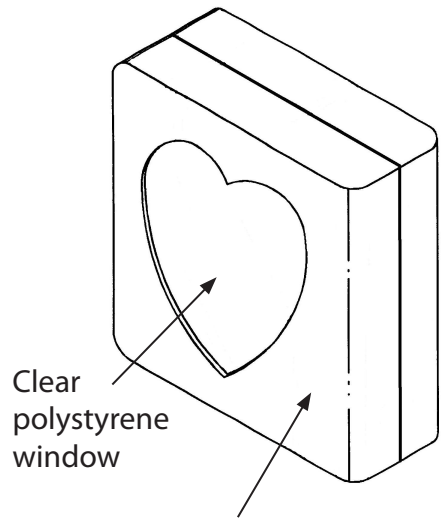
(i) advertising the product contained inside

(2)

(ii) protecting the product contained inside.

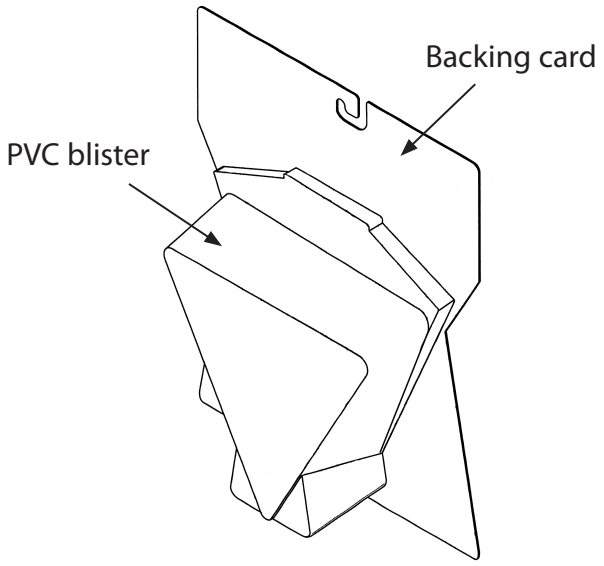
(2)

*(d) Drawings A and B below show two different types of toy packaging.



Two part injection moulded polystyrene case with internal compartments

Packaging A



Packaging B

Evaluate packaging A compared with packaging B in terms of built-in obsolescence for a 'throwaway' culture.

(6)

(Total for Question 13 = 16 marks)

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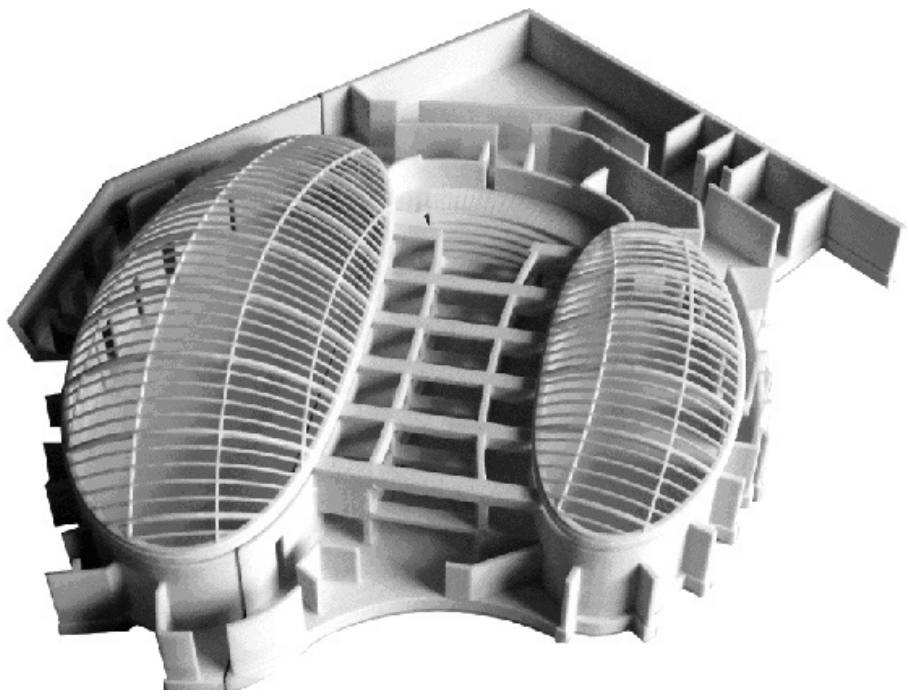
Turn over for question 14

14 The picture below shows a one-off architectural model made using rapid prototyping.



(a) Give **three** advantages of making the model using rapid prototyping rather than modelling using hand tools and equipment.

(3)

1 .....

2 .....

3 .....

(b) Explain **one** reason for making an architectural model of a building at the development stage of the design process.

(2)

(c) A 3D virtual reality model was also made of the building.

Explain **two** advantages of this type of modelling compared with traditional architectural modelling.

(4)

1 .....

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2 .....

.....

.....

(d) The architectural model was made by rapid prototyping using the stereolithography (SLA) process.

In the space below, using notes and sketches, describe the stereolithography process.

(4)

*(e) The architect is based in England, whilst the client and the site for the actual building are located in India.

Discuss the benefits of electronic communication between the architect, the client, and the construction company during the building project.

(6)

(Total for Question 14 = 19 marks)

TOTAL FOR PAPER = 80 MARKS

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