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Surname

Other names

**Pearson**  
**Edexcel GCSE**

Centre Number

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Candidate Number

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# Design and Technology

## Unit 2: Knowledge and Understanding of Graphic Products

Tuesday 19 June 2018 – Morning  
**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 with your spelling, punctuation and grammar, as well as the clarity of expression.*

### Advice

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

Turn over ►

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**Answer ALL questions.**

**Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.**

**1** Which **one** of the following aims to reduce greenhouse gas emissions?

- A** Kyoto Protocol
- B** Brussels Agreement
- C** Maastricht Treaty
- D** Geneva Convention

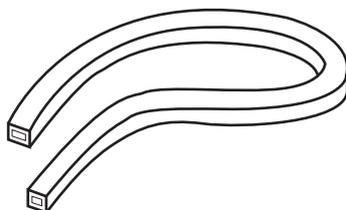
**(Total for Question 1 = 1 mark)**

**2** Which **one** of the following materials is used for producing block models?

- A** Polypropylene
- B** Medium density fibreboard
- C** Thermochromic liquid crystals
- D** Solid white board

**(Total for Question 2 = 1 mark)**

**3** Which piece of equipment is shown below?



- A** French curve
- B** Protractor
- C** Flexicurve
- D** Stencil

**(Total for Question 3 = 1 mark)**



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4 Which **one** of the following can be converted into fuel for transportation?

- A Biopol
- B Biodiversity
- C Biomass
- D Biosphere

(Total for Question 4 = 1 mark)

5 The scale of production most suitable for producing tickets for a school music concert would be?

- A Batch
- B Continuous
- C Mass
- D One-off

(Total for Question 5 = 1 mark)

6 Which type of paper is used for overlays that show annotations for designs?

- A Cartridge paper
- B Copier paper
- C Tracing paper
- D Sugar paper

(Total for Question 6 = 1 mark)

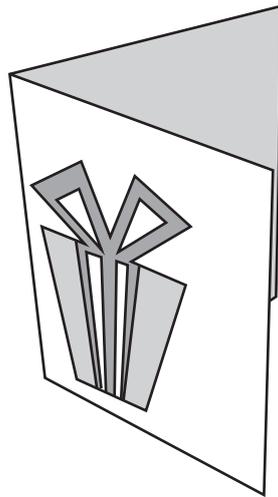
7 Which **one** of the following would be most appropriate for the packaging of a children's board game?

- A High density polystyrene
- B Folding boxboard
- C Foil-lined board
- D Corrugated board

(Total for Question 7 = 1 mark)



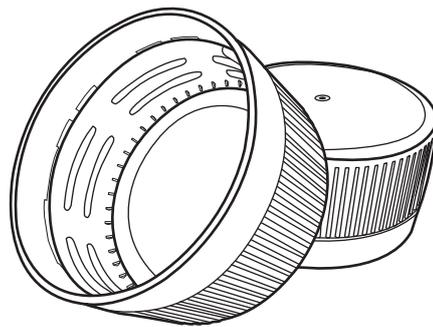
- 8 Which **one** of the following printing methods would be used to print images onto a mass produced greetings card, as shown below?



- A Gravure
- B Letterpress
- C Pad printing
- D Photocopying

(Total for Question 8 = 1 mark)

- 9 Which **one** of the following processes would be used to mass produce the screw-on bottle top shown below?



- A Vacuum forming
- B 3D printing
- C Extrusion
- D Injection moulding

(Total for Question 9 = 1 mark)



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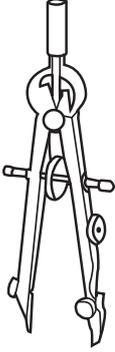
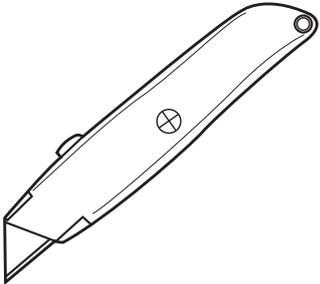
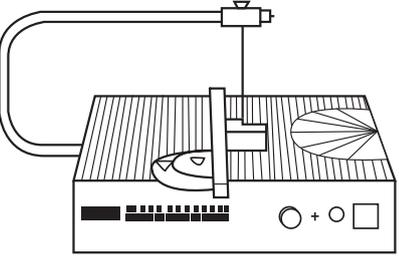
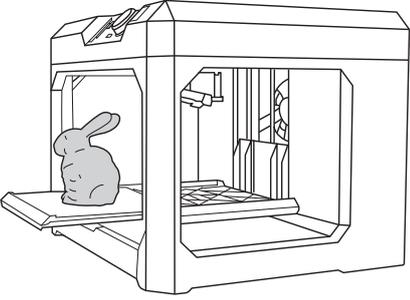
10 Which **one** of the following is **not** a characteristic of high definition (HD) TV?

- A The width to height ratio of the screen is 16:9
- B The resolution of the screen is between 720p and 1080i
- C The frame rate is always the same as conventional televisions
- D Video and audio are both compressed for transmission

(Total for Question 10 = 1 mark)



11 (a) Complete the table below by giving the missing names and uses.

Tool/equipment	Name	Use
	Compass	(1)
		To cut or score board (1)
		Used to cut/slice/burn through foam to make shapes (1)
	3D Printer	(1)

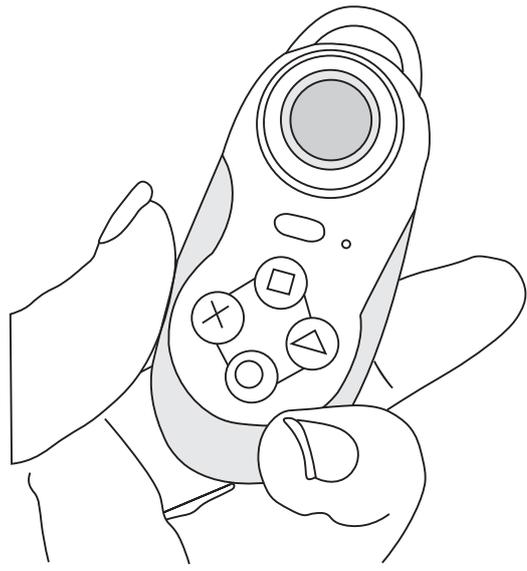
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(b) The drawing below shows a block model of a handheld game controller.



(i) Give **three** reasons for making a block model of the handheld game controller.

(3)

1 .....

2 .....

3 .....

(ii) The rough outline of the block model of the handheld game controller has been cut out using a scroll saw (vibrosaw).

Give **two** safety precautions that should be used when using a scroll saw.

(2)

1 .....

2 .....



(iii) Polymorph is an alternative material for producing models.

Explain **two** advantages of using polymorph for producing models.

(4)

1 .....

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2 .....

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(c) The handheld game controller will be injection moulded from polyvinyl chloride (PVC).

(i) Explain **one** reason for using PVC to make the handheld game controller.

(2)

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(ii) Explain **two** advantages of injection moulding the handheld game controller.

(4)

1 .....

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2 .....

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(Total for Question 11 = 19 marks)



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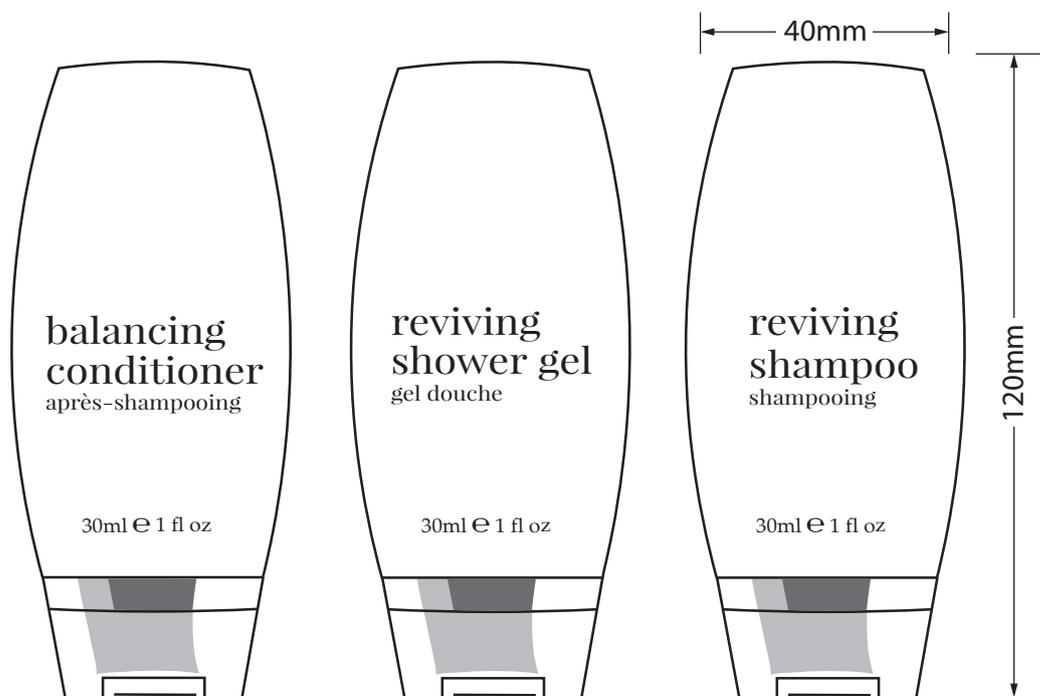
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12 You have been asked to design a package for a range of bath and shower products that are made from natural ingredients.

The specification for the packaging is that it must:

- have a nature theme
- hold three bottles
- keep the bottles upright
- allow the fronts of the three bottles to be seen
- allow it to be displayed in a shop
- allow the bottles to be removed easily from the packaging
- be produced from materials that can be recycled
- 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 packaging that meet the specification points above.

Candidates are reminded that if 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.**



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Design idea 1

(8)

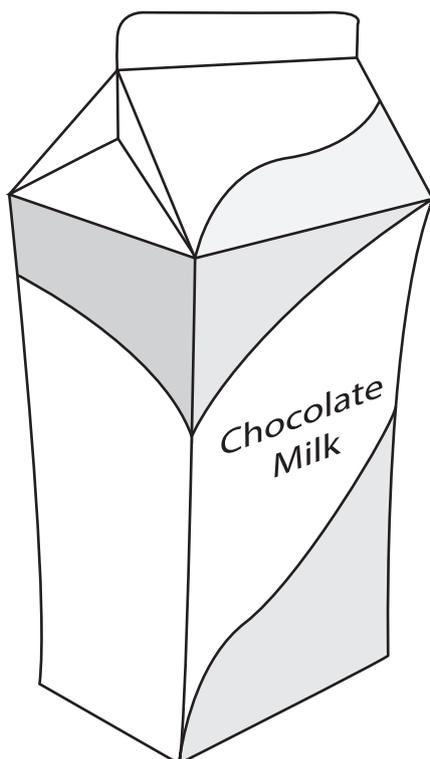
Design idea 2

(8)

**(Total for Question 12 = 16 marks)**



13 The drawing below shows a Tetra Pak™ carton used for flavoured milk.



- (a) (i) Give **two** properties of Tetra Pak™ that make it a suitable material once it has been formed into the carton.

For each property justify your answer.

(4)

Property 1

Justification

Property 2

Justification



(ii) Explain **one** advantage of using flexography for printing the graphic image onto the carton.

(2)

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(b) Explain how the Tetra Pak™ carton is successful in meeting the following specification points:

(i) being able to pour the contents easily

(2)

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(ii) being able to be mass produced.

(2)

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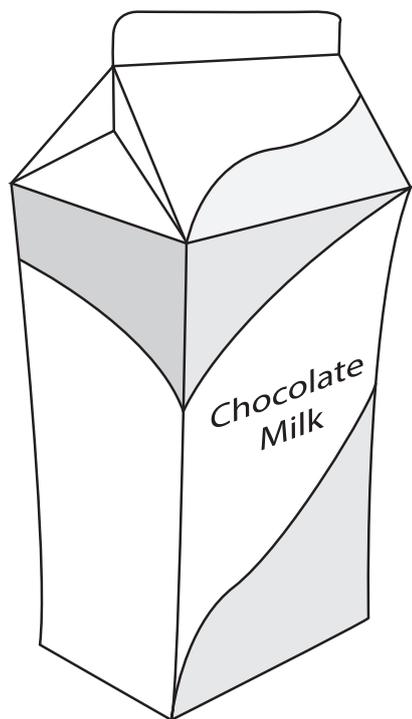
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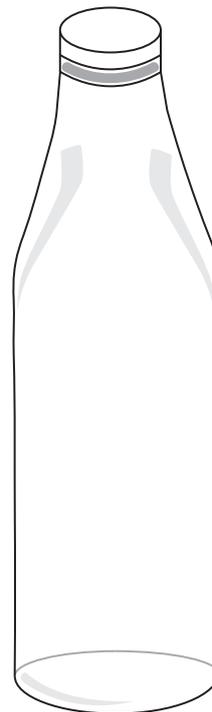
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\*(c) The drawings below show two different types of package for flavoured milk.



Package A – Tetra Pak™ carton



Package B – Glass bottle

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Evaluate package A in comparison to package B in terms of sustainability and performance requirements.

(6)

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**(Total for Question 13 = 16 marks)**



14 The drawing below shows a digital monitor that can be worn to count the number of steps the user takes every day.



(a) The step counter makes use of liquid crystal display (LCD) technology.

(i) Give **one** reason for using LCDs for the step counter.

(1)

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(ii) The LCD display is attached to the casing using epoxy resin.

Explain **two** reasons why epoxy resin is used to join the two parts together.

(4)

1 .....

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2 .....

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(b) The digital step counter is to be sold by both large and small retailers.

Explain **two** advantages of using an electronic point of sale (EPOS) system when selling the step counters.

(4)

1 .....

2 .....

(c) The step counters are sold in individual boxes that have designs printed on them using screenprinting.

Explain **two** advantages of using screenprinting for adding the designs to the boxes.

(4)

1 .....

2 .....



\* (d) The step counters are secondary packaged into large corrugated board boxes for shipping to shops.

Discuss the use of corrugated board for making the boxes.

(6)

Area with horizontal dotted lines for writing the answer.

**(Total for Question 14 = 19 marks)**

**TOTAL FOR PAPER = 80 MARKS**

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