

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCE

Design and Technology

Product Design: Graphic Products

Advanced Subsidiary

Unit 2: Design and Technology in Practice

Tuesday 22 May 2012 – Afternoon

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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PEARSON

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

- 1** Figure 1 shows a drinks carton made from a packaging laminate of folding boxboard, aluminium foil and polyethylene.

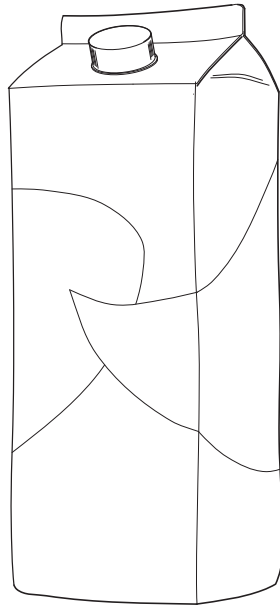


Figure 1

- (a) Give **one** reason why folding boxboard is used in the packaging laminate.

(1)

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- (b) Explain why a thin layer of aluminium is used in the packaging laminate.

(2)

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(c) Give **one** aesthetic and **one** functional reason why the packaging laminate has a polyethylene surface coating.

(2)

Aesthetic

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Functional

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(d) Explain **one** advantage of using computer aided design (CAD) when designing packaging.

(2)

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(e) British and European quality standards organisations produce voluntary and statutory regulations for packaging designers.

State **three** ways these regulations effect the design of packaging.

(3)

1

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2

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3

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(f) Quality control checks are made during the printing of the carton package.

Complete the table below by:

- stating **one** effect of the problem
- drawing the quality control printer's mark associated with that problem.

Problem	State one effect of the problem	Draw the quality control printer's mark associated with the problem
Bad register	(1)	(1)
Colour variation	(1)	(1)

(Total for Question 1 = 14 marks)



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2 Figure 2 shows a planometric (axonometric) drawing of a prototype kitchen.

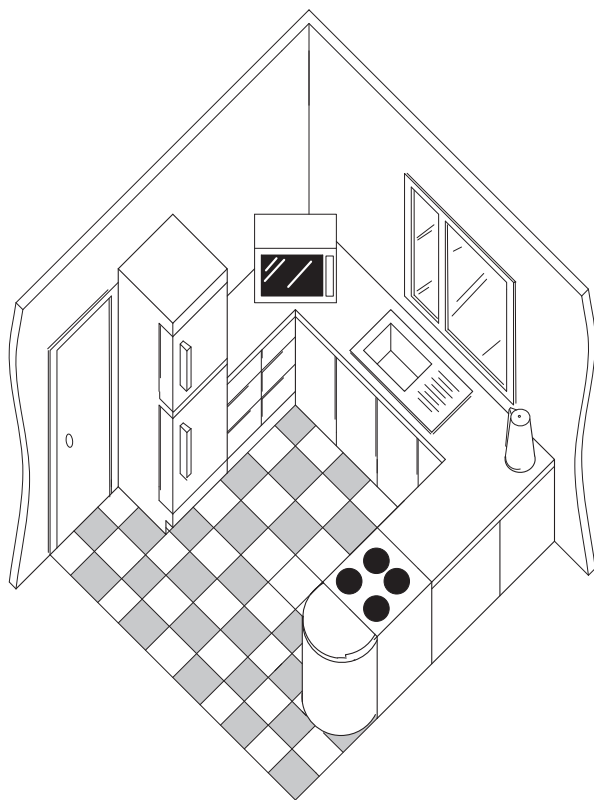


Figure 2



(a) In the space below draw an **orthographic plan view** of the kitchen shown in Figure 2.

(5)



(b) The designer's original plans were drawn on layout paper.

Explain **one** property of layout paper that makes it suitable for this use.

(2)

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(c) The designer modelled the prototype kitchen units using pine.

Explain why pine is a suitable material for modelling the prototype units.

(2)

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(d) Employers must safeguard the risk of injury to employees in the work place.

State **two** procedures used in the work place by employers to ensure employees' safety.

(2)

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(e) Quality assurance systems are used throughout the design and manufacture of the kitchen units.

Outline the key concepts of quality assurance (QA).

(3)

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(Total for Question 2 = 14 marks)



3 Figure 3 shows typical packaging for electrical products.

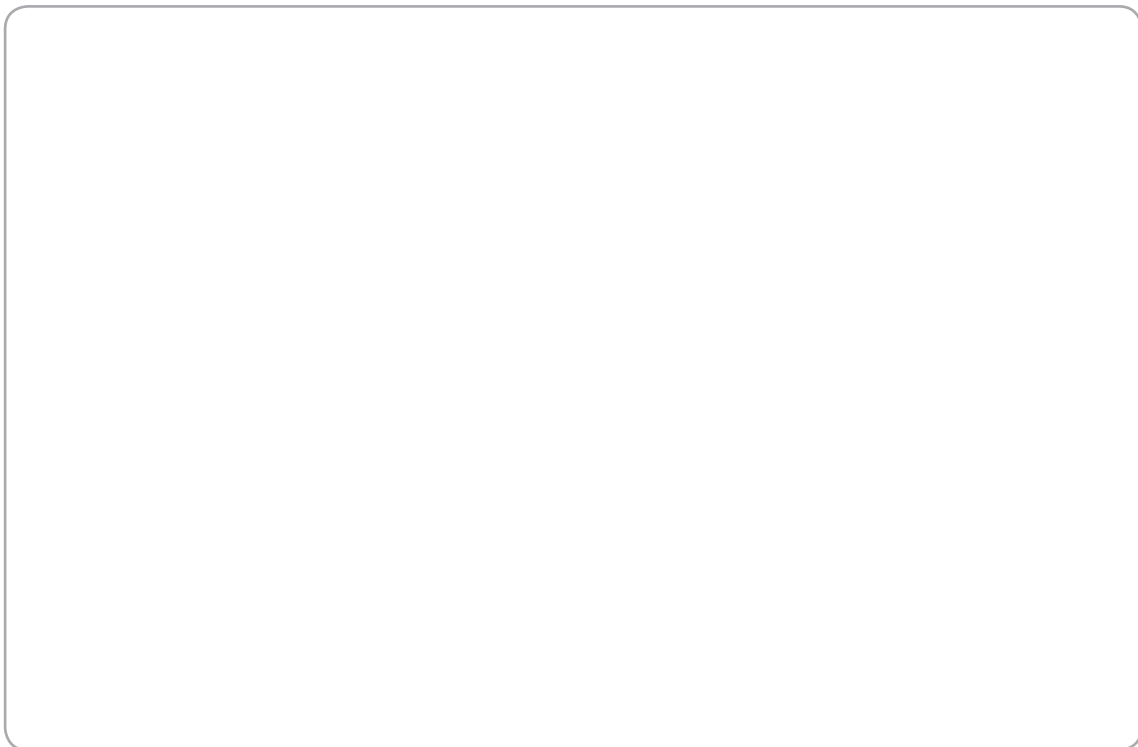


Figure 3

(a) The package boxes are made of corrugated board.

(i) In the box below draw an annotated cross section of corrugated board.

(2)



(ii) Explain why corrugated board is used to package electrical products.

(2)

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(b) Figure 4 shows a commercially available packaging net.

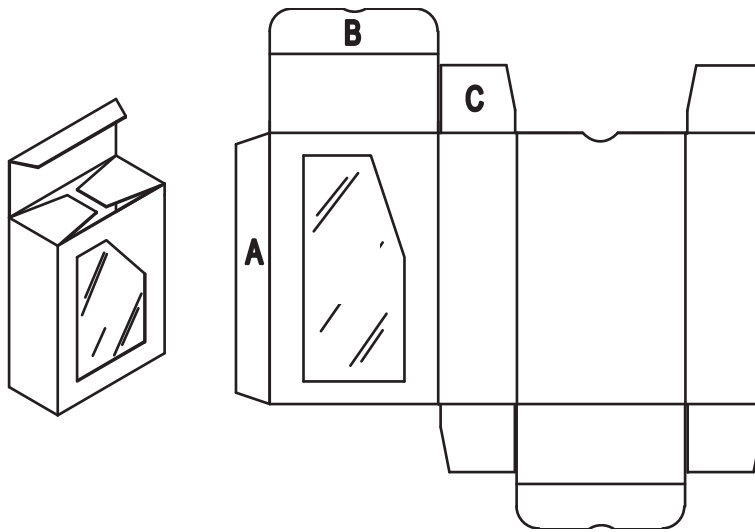


Figure 4

Complete the table below by naming the specific features labelled on the net in Figure 4.

(3)

Feature	Name
A	
B	
C	



(c) Information is printed on the packaging using the flexography printing process.

Explain **two** reasons why flexography is an appropriate printing process for use on corrugated board.

(4)

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(d) The product tray is manufactured using recycled paper pulp.

Discuss the environmental impact of using recycled paper pulp packaging.

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(Total for Question 3 = 14 marks)



4 Figure 5 shows an acrylic shop sign for a high street retail chain.



Figure 5

(a) The lettering is cut using a CNC laser cutter.

Describe the **advantages** of using laser cutters to cut out the lettering rather than hand cutting and traditional finishing processes.

(3)

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(b) Outline why acrylic is a suitable material for exterior shop signs.

(3)

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(c) The acrylic letters are joined to the acrylic backboard with acrylic cement (Tensol 12) adhesive.

Health and safety warning symbols are displayed on the adhesive containers.

Complete the table below by giving the meaning of each of the warning symbols. (2)

Symbol	Meaning
	
	

(d) Storing solvent based acrylic cement correctly is essential to comply with the Control of Substances Hazardous to Health (COSHH) regulations.

State **two** control measures for storing solvent based acrylic cement. (2)

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*(e) The shop logo is also reproduced on delivery vans using self adhesive vinyl.

Describe the process of producing and applying CAD/CAM produced vinyl signs.

(4)

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(Total for Question 4 = 14 marks)



5 Figure 6 shows a modern carbon fibre racing bike.



Figure 6

*(a) Evaluate, using both advantages and disadvantages, the use of carbon fibre in the manufacture of racing bike frames as opposed to steel.

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Figure 7 shows a duralumin chain set for the carbon fibre racing bike.



Figure 7

(b) Explain **two** advantages of using duralumin for the chain set on carbon fibre racing bikes.

(4)

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*(c) During the design of the frame, the designer used 3D surface modelling computer aided design (CAD).

Discuss the benefits of using 3D surface modelling in comparison to using 2D CAD.

(5)

A series of horizontal dotted lines providing space for the student to write their answer.

(Total for Question 5 = 14 marks)

TOTAL FOR PAPER = 70 MARKS



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