

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

For Examiner's Use
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General Certificate of Secondary Education  
June 2008

**DESIGN AND TECHNOLOGY  
(PRODUCT DESIGN)  
Written Paper  
Foundation Tier**

**3544/F  
F**



Monday 2 June 2008 9.00 am to 11.00 am

**For this paper you must have:**

- a pen, a pencil, a ruler, an eraser, a pencil sharpener and coloured pencils.

Time allowed: 2 hours

**Instructions**

- Use black ink or black ball-point pen. Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Do all rough work in this book. Cross through any work you do not want to be marked.

**Information**

- The maximum mark for this paper is 125.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

For Examiner's Use			
Question	Mark	Question	Mark
1		5	
2		6	
3		7	
4		8	
Total (Column 1) →			
Total (Column 2) →			
<b>TOTAL</b>			
Examiner's Initials			









J U N 0 8 3 5 4 4 F 0 1

Answer **all** questions in the spaces provided.

**1** Question 1 is about environmental issues.

You are advised to spend about 10 minutes on this question.

**1** (a) Choose **three** of the following products and state how they can be recycled or reused.

Product	How it could be recycled or reused
Wine bottle 	
Inkjet cartridge 	
Car tyre 	
Aluminium drinks can 	
Mobile telephone 	
Woollen jumper 	

(3 marks)



- 1 (b) Give **two** reasons why consumers should recycle products.

Reason 1 .....

.....

(2 marks)

Reason 2 .....

.....

(2 marks)

- 1 (c) (i) Explain why this type of drinks carton is difficult to recycle.



.....

.....

(2 marks)

- 1 (c) (ii) Suggest an alternative type of packaging and explain why it would be more environmentally friendly.

.....

.....

(2 marks)



2 Question 2 is about materials and components.

You are advised to spend about 10 minutes on this question.

2 (a) Select **three** of the materials in the table below. Name the source of each of the chosen materials. An example has been done for you.

Material	Source
<i>Flour</i>	<i>Wheat grains</i>
Earthenware clay	
Scots pine	
Woollen yarn	
Copper sheet	
Paper	
Cheese	
Polyester	

(3 marks)

2 (b) The table below shows different types of materials.

Tick the relevant boxes for **two** materials to indicate whether the material is renewable or non-renewable.

Material	Renewable	Non-renewable
Earthenware clay		
Scots pine		
Woollen yarn		
Copper sheet		
Paper		
Cheese		
Polyester		

(2 marks)



**2 (c) Materials are often combined.**

These are known by various terms such as composites, alloys, blends, laminations etc.

Name a product and explain why it is made from a combination of materials.

An example is provided to help you.

Product	Explanation
<i>Kitchen worktop</i>	<i>Melamine laminate is glued onto chipboard to make a hard, durable surface.</i>
.....	.....
	.....
	.....
	.....

(3 marks)

**2 (d) Pre-manufactured standard components are used in the making of products.**

**2 (d) (i) Name a product and a component used in its manufacture.**

Product .....

Component .....

(1 mark)

**2 (d) (ii) Explain in detail why components are used in manufactured products.**

.....

.....

.....

.....

(3 marks)

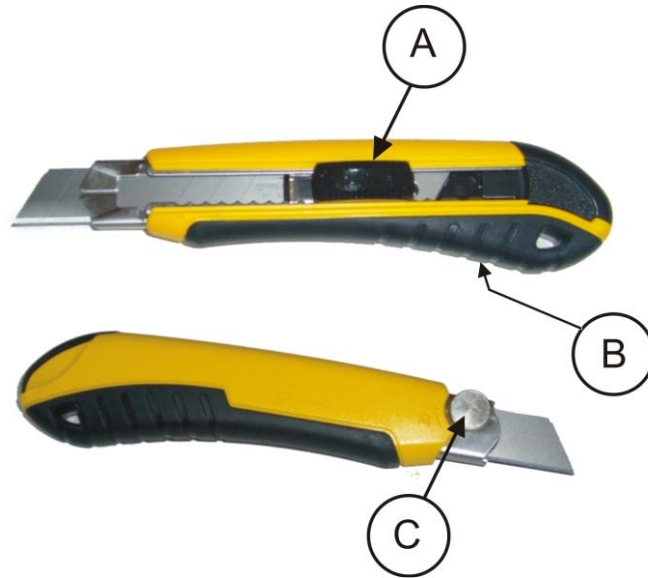


3 Question 3 is about human factors and packaging.

You are advised to spend about 25 minutes on this question.

3 A craft knife with a replaceable 'snap-off' blade is shown in **Figure 1** with three features labelled A, B and C.

**Figure 1**



3 (a) Ergonomics is important in the design of this knife.

3 (a) (i) Choose **one** of the features labelled and explain what ergonomic considerations were needed.

Feature .....

Explanation .....

.....

.....

(2 marks)

3 (a) (ii) Colour is also an important design feature of the craft knife.

Explain why this is the case.

.....

.....

.....

.....

(2 marks)



- 3 (b) **Figure 2** shows a design for a craft knife with a fixed blade.

Spare replacement blades are carried inside the aluminium handle.

**Figure 2**



Suggest **two** features of the knife shown in **Figure 1** that are improvements on the design shown in **Figure 2**.

Feature 1 .....

Reason .....

.....

.....

(3 marks)

Feature 2 .....

Reason .....

.....

.....

(3 marks)

**Question 3 continues on the next page**

**Turn over ►**



**3 (c)** Packaging is needed for the craft knife shown in **Figure 1**.

This should be a clear blister pack produced from card and plastic.

Using the drawing shown on the opposite page as a guide, design the packaging so it can be hung on a rack in a DIY store.

Add notes to your drawings to explain the following details:

- how the packaging will be hung (2 marks)
- where the name and company logo will be printed (1 mark)
- where the instructions will be printed (1 mark)
- how the separate parts will be assembled. (2 marks)

Marks will be given for quality of communication. (3 marks)





Draw your idea for the blister packaging on this sheet and add notes to explain the details.



Question 3 continues on the next page

Turn over ►



- 3 (d) In commercial production what process could be used to cut out the card part of the blister pack?

.....

.....

(2 marks)

- 3 (e) Name a suitable commercial printing process for the card part of the blister pack.

.....

(2 marks)

- 3 (f) Explain what each of the following symbols mean when seen on packaging.



.....

(1 mark)



.....

(1 mark)



**Turn over for the next question**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**

**Turn over ►**



4 Question 4 is about products that have a similar function.

You are advised to spend about 10 minutes on this question.

4 (a) The range of lights shown below have different uses.

Rechargeable work light

**A**



LED Key fob light

**B**



Portable desk light

**D**



Cycle light

**C**



Choose **two** lights from above.

Explain what type of consumer might purchase each of the chosen lights and how it would meet their needs.

Light selected .....

Explanation .....

.....

.....

.....

(3 marks)

Light selected .....

Explanation .....

.....

.....

.....

(3 marks)



- 4 (b) Advances in lighting technology have provided many advantages, over the traditional tungsten filament lamp, to both designer and consumer.

**Figure 3**

Tungsten filament lamp



Choose **one** of the following new technologies and explain **two** advantages and **one** disadvantage compared to traditional tungsten filament lamps.

**Figure 4**

12-volt halogen lamp



**Figure 5**

Energy saving lamp



Lamp .....

Advantage 1 .....

.....  
(2 marks)

Advantage 2 .....

.....  
(2 marks)

Disadvantage .....

.....  
(2 marks)



5 Question 5 is about manufacturing in school.

You are advised to spend about 10 minutes on this question.

5 Your school are organising an exhibition of Design and Technology work and have seen the sign below at a neighbouring school. The sign has been made by photographing products manufactured at the school.



Using notes and sketches, explain in the space opposite how **one** of the products shown above could be made.

Marks will be awarded for the following:

- naming **one** material
- a full explanation of the separate stages of manufacture
- quality of communication.

(1 mark)

(4 marks)

(3 marks)



Letter: .....

Material .....

8

Turn over ►



6 Question 6 is about manufacturing in quantity.

You are advised to spend about 25 minutes on this question.

6 A school wishes to sell gifts at an exhibition and want an idea which is simple and inexpensive to manufacture in quantity.

They have come up with the following list:

badges	bookmarks	key fobs	biscuits	photo frames
egg cups	table mats	candle holders	chocolates	printed T-shirts

6 (a) Choose **one** gift from the list. Using notes and sketches, show your idea in the space below.

In part (c) you will be asked how to manufacture this gift.

Marks will be awarded for the following:

- the feasibility of the idea (2 marks)
- quality of notes and sketches (4 marks)
- use of colour and tone. (2 marks)





- 6 (b) (i) Name the main material used in your design.

.....

(1 mark)

- 6 (b) (ii) Explain why your design is suitable for production in quantity.

.....

.....

.....

(2 marks)

**Question 6 continues on the next page**

**Turn over ►**



- 6 (c) Using notes and sketches explain how you would make a batch of 50 identical gifts based upon your design in part (a).

Marks will be awarded for:

- an accurate description of each stage of the process (4 marks)
- how you will make sure that all of your gifts are identical (2 marks)
- correct naming of tools and equipment (2 marks)
- quality of communication. (2 marks)

Tools and equipment



- 6 (d) (i) Give a risk which may cause harm to you or others when making your gift.

.....

.....

(1 mark)

- 6 (d) (ii) Explain how you could minimise the risk.

.....

.....

.....

(2 marks)

**Turn over for the next question**

24

**Turn over ►**

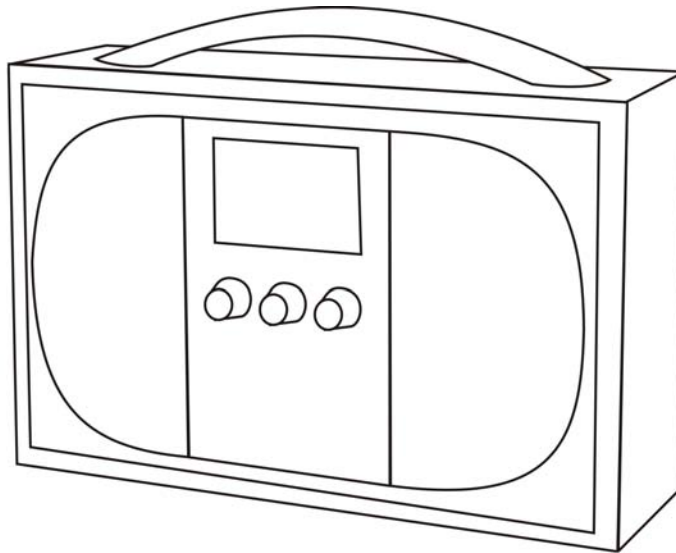


7 Question 7 is about designing.

You are advised to spend about 20 minutes on this question.

7 Designers use tone to make products look three-dimensional.

7 (a) Add colour **and** tone to the product below to make it look three-dimensional.



(3 marks)

7 (b) Explain **three** ways that you could use ICT (Information Communication Technology) when designing products.

1 .....

.....

(2 marks)

2 .....

.....

(2 marks)

3 .....

.....

(2 marks)



7 (c) Choose **two** of the following terms and explain what they mean.

- Design specification
- Product analysis
- Prototype
- Evaluating

Term .....

Meaning .....

.....

.....

.....

(3 marks)

Term .....

Meaning .....

.....

.....

.....

(3 marks)

**Question 7 continues on the next page**

**Turn over ►**



- 7 (d) **Figure 6** and **Figure 7** show radios, one manufactured and sold in the 1950s and one manufactured and sold now.

**Figure 6**



**Figure 7**



- 7 (d) (i) What name is given to new products which are styled on designs from the past?

.....  
(1 mark)

- 7 (d) (ii) List **three** ways in which the radio shown in **Figure 7** is an improvement on the radio shown in **Figure 6**.

1 .....  
(1 mark)

2 .....  
(1 mark)

3 .....  
(1 mark)

- 7 (d) (iii) The radio shown in **Figure 7** uses more plastics in its construction than the radio shown in **Figure 6**.

Give **two** reasons why plastics have been chosen.

Reason 1 .....  
.....  
(2 marks)

Reason 2 .....  
.....  
(2 marks)



8 Question 8 is about human factors.

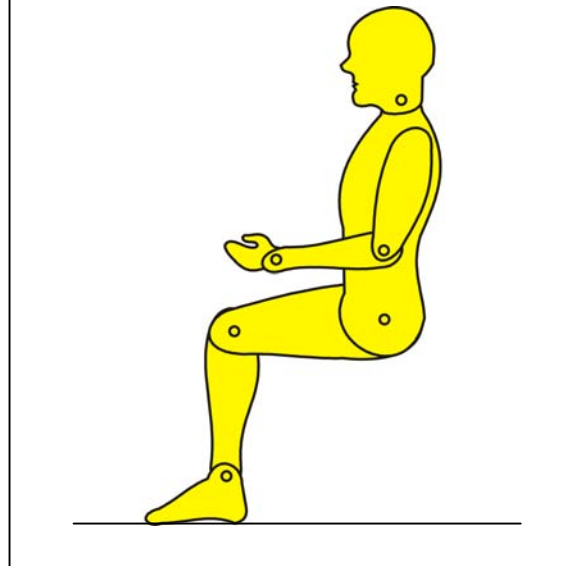
You are advised to spend about 10 minutes on this question.

8 Anthropometric data has been used in the design of the computer chair below.

Computer workstation chair



Ergonomic Figure

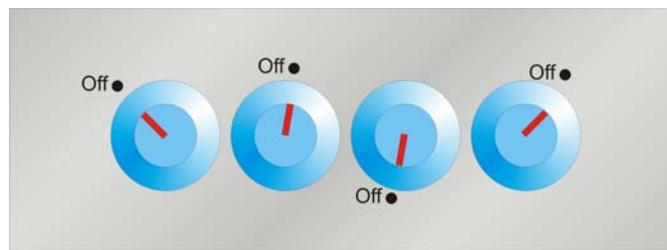


8 (a) Show on the diagram of the ergonomic figure **three** measurements that would have been taken in order to design the chair.

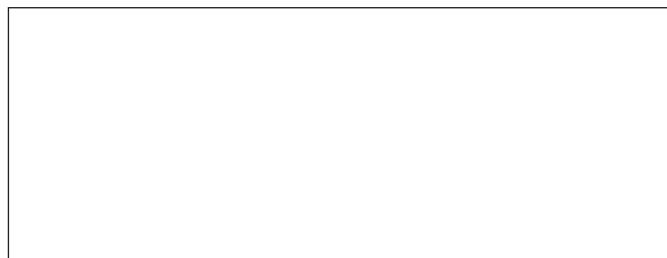
(3 marks)

8 (b) The diagram below shows four control dials.

Each dial is in the off position.



In the space provided below draw the dials so it is easier to check if all four dials are in the off position.



Question 8 continues on the next page

(2 marks)

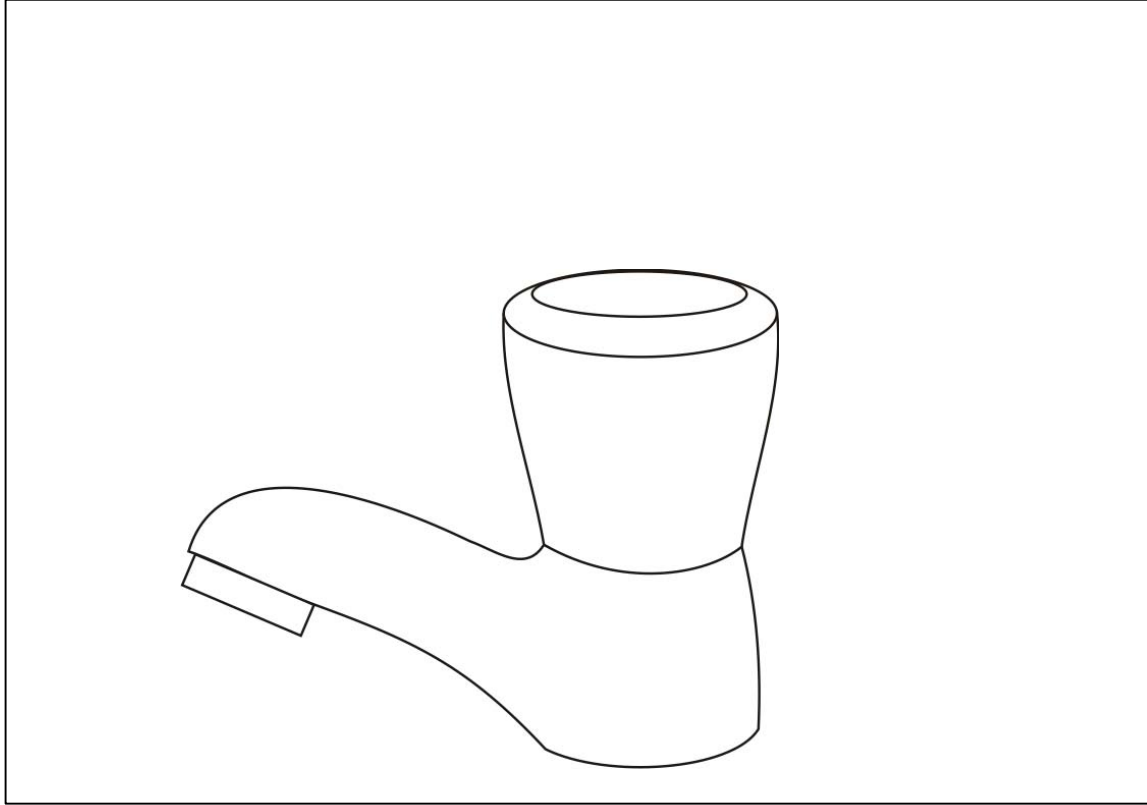
Turn over ►



8 (c) The diagram below shows a water tap.

8 (c) (i) Using notes and sketches, show how you would make it easier for use by an elderly or disabled person.

(3 marks)



8 (c) (ii) Explain the benefit to the elderly or disabled person of the changes you have made.

.....

.....

.....

(2 marks)

**END OF QUESTIONS**

**10**

