



Rewarding Learning

General Certificate of Secondary Education
2014

Centre Number

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Candidate Number

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Technology and Design

Unit 3: Product Design



[GTD31]

TUESDAY 3 JUNE, AFTERNOON

GTD31

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

Questions which require drawing or sketching should be completed using an HB pencil. All other questions must be completed in blue or black ink.

Do not write with a gel pen.

Answer **all eight** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.



Answer **all** questions

1 (a) Blow moulding and injection moulding are two common industrial manufacturing processes used to produce plastic components.

(i) Which process is considered as a **reforming** process?

_____ [1]

(ii) Which process is considered as a **deforming** process?

_____ [1]

(b) (i) Outline **three** key features or stages of the **blow moulding** process.

1. _____

2. _____

3. _____

_____ [3]

(ii) Outline **three** key features or stages of the **injection moulding** process.

1. _____

2. _____

3. _____

_____ [3]

Examiner Only

Marks Remark

Total Question 1





2

Manufacturing practices involve the use of machines and power tools.

State **two** applications/uses of each of the following machines.

Circular Saw

1. _____
_____ [1]

2. _____
_____ [1]

Milling Machine

1. _____
_____ [1]

2. _____
_____ [1]

Planer

1. _____
_____ [1]

2. _____
_____ [1]

Lathe

1. _____
_____ [1]

2. _____
_____ [1]

Examiner Only	
Marks	Remark
Total Question 2	

8700

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20GTD3103

(b) State **three** properties of aluminium alloy which make it a suitable material for the ladder.

1. _____
2. _____
3. _____ [3]

(c) State the advantage of purchasing a ladder with the Kitemark or CE markings.

_____ [2]

(d) Outline **two** design features of the ladder which are based on anthropometric data.

1. _____
2. _____ [2]

Examiner Only	
Marks	Remark

Total Question 3	

[Turn over

8700



20GTD3105

4 Intellectual Property falls into a number of areas which include copyright, trademarks and patents.

(a) Outline what is meant by Intellectual Property.

_____ [2]

(b) Individuals or companies often apply for copyright, trademarks or patents. Give a brief explanation of each of the following:

- Copyright
- Trademarks
- Patents

Copyright _____

_____ [2]

Trademarks _____

_____ [2]

Patents _____

_____ [2]

Examiner Only

Marks Remark

Total Question 4

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20GTD3106



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20GTD3107

5 (a) A company engaged in the manufacture of gardening equipment is reordering stock. The stock is reordered using the **just-in-time** process.

(i) Give **two** reasons for using the **just-in-time** process.

1. _____

2. _____
_____ [2]

(ii) The company uses standardised components.

Outline **two** features of this industrial practice.

1. _____
2. _____ [2]

(b) **Fig. 2** shows a sketch of a wheelbarrow manufactured by the company.

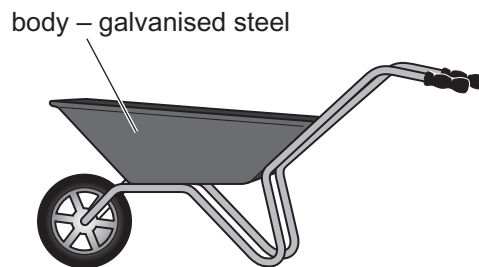


Fig. 2

(i) Give **one** reason why the body is galvanised.

- _____ [1]

Examiner Only	
Marks	Remark



6 An outline diagram of a manufactured component is shown in Fig. 3. The diagram also shows two key dimensions and their tolerance.

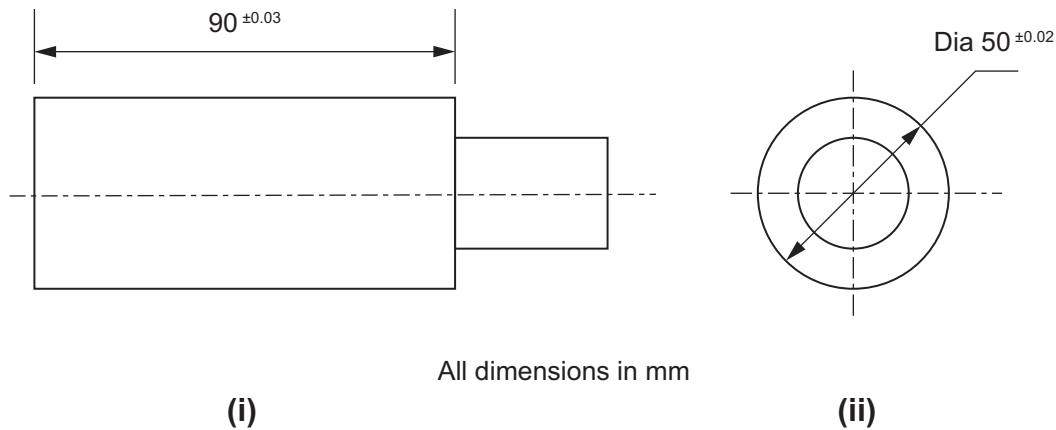


Fig. 3

(a) Calculate the maximum and minimum acceptable values for each of the given dimensions.

(i) Maximum _____ Minimum _____ [1]

(ii) Maximum _____ Minimum _____ [1]

(b) During sample testing of the components it was found that 10% were outside the tolerance.

(i) Explain what is meant by sample testing.

 _____ [2]

Examiner Only	
Marks	Remark





(ii) The quality control department demanded that this percentage should be reduced.

Give **one** reason why the quality control department would want this percentage reduced.

_____ [1]

(iii) Outline **one** method the company could use to reduce this percentage.

_____ [1]

(c) Outline **two** characteristics of quality assurance.

1. _____
_____ [1]

2. _____
_____ [1]

Examiner Only	
Marks	Remark
Total Question 6	

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20GTD3111

7 Freehand sketches are frequently used in the communication of design ideas.

(a) (i) Give **one** reason why it is important to produce good freehand sketches.

_____ [1]

(ii) Annotation or notes are often added to sketches.

What is the purpose of adding annotation to freehand sketches?

_____ [1]

(iii) Give **two** advantages of using brief notes for annotation rather than long comments.

1. _____

2. _____
_____ [2]

Examiner Only

Marks Remark



(b) The design process also makes use of modelling techniques which include mock-ups, prototypes and computer modelling.

(i) State a benefit of using computer modelling.

_____ [1]

(ii) Clearly explain the difference between mock-ups and prototypes. Your explanation should include how, when and why each would be used by a designer in the design process.

_____ [3]

Examiner Only

Marks Remark

Total Question 7

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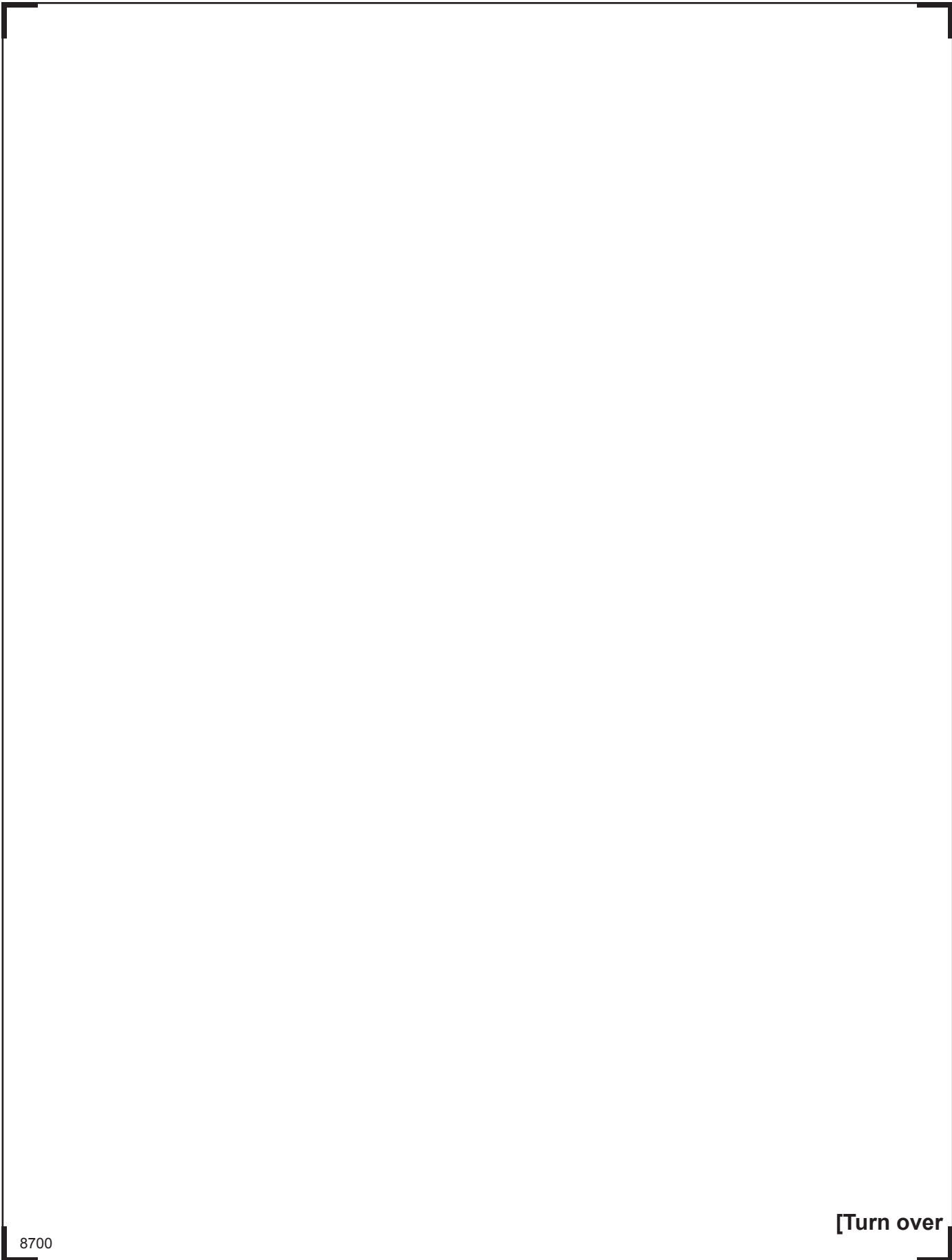
8 Using an annotated sketch or sketches, design an adjustable desk lamp suitable for a bedside table or unit. The lamp is to be made from materials generally available in a school workshop. The design must satisfy the following:

- The height or angle of the lamp should be easily adjustable. [4]
- Material(s) selection, justification and the economy of material(s) used. [4]
- It must have an on/off switch and its own 9 volt battery supply which must be accessible to replace the battery. Details of circuit/electronic systems are not asked for. [4]
- Must be stable to sit on a bedside table or unit. [4]
- Must be an aesthetically pleasing and functional design. [4]
- Good quality annotated sketches should be used. A minimum of three overall dimensions should be included. [4]

Use the next page for your answer. If you need more space there is an additional page overleaf.

Examiner Only	
Marks	Remark
Total Question 8	





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For Examiner's use only	
Question Number	Marks
1	
2	
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7	
8	

Total Marks	
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Examiner Number

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