



Rewarding Learning

ADVANCED SUBSIDIARY (AS)  
General Certificate of Education  
January 2009

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## Technology and Design

### Assessment Unit AS 1

*assessing*

Unit 1 – Product Design and Practice:  
Materials, Components and their Uses

[ASV11]



THURSDAY 8 JANUARY, MORNING

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#### TIME

1 hour 30 minutes.

#### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number on the Answer Booklet provided and on the A3 pro forma answer page provided.

Answer **all seven** questions.

Answers to Question **1(b)** in Section A should be made on the A3 pro forma answer page provided.

You are provided with an insert for use with Question **1** and Question **3**.

Do not write your answers on this insert.

#### INFORMATION FOR CANDIDATES

The total mark for this paper is 60, including a maximum of 3 marks for quality of written communication.

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

At the conclusion of the examination, attach the A3 pro forma answer page securely to the Answer Booklet with the treasury tag supplied.

A materials data sheet is provided.

## Section A

Answer the **one** question in this section.

You are advised to spend approximately **45 minutes** on this section.

**1** The bottle opener as shown in **Fig. 1** to **Fig. 5** on the insert sheet, is a low cost product which enables the user to open corked and metal capped bottles.

(a) With reference to **Fig. 1** to **Fig. 5** on the insert sheet, complete the following:

(i) Give **two** main reasons why the manufacturer has used

- mild steel for the body (**Fig. 3**)
- nylon for the plastic insert (**Fig. 4**) [4]

(ii) Give **two** main reasons in support of the view that this product has good aesthetic appeal. [2]

(iii) Give **two** main reasons why the bottle opener can be considered to be a low cost product. [2]

(iv) Give **two** main reasons why riveting was used to attach the handles to the body. [2]

(v) Suggest an appropriate manufacturing process for the parts below and give **one** main reason why each is suitable.

- Handle (**Fig. 5**)
- Nylon insert (**Fig. 4**) [4]

(vi) Give **one** main reason why chrome plating was used as a surface finish for the product. [2]

(b) With the aid of detailed annotated sketches, using the blank A3 pro forma answer page (answer number **1(b)**), produce appropriate designs for the following:

(i) A re-useable plastic cover for the corkscrew tip that will improve the safety of the product. It should remain attached to the bottle opener when not in use. (**Fig. 2**) [6]

After prolonged use it was found that the insert was starting to fall out of the body. (**Fig. 2**)

(ii) A semi-permanent method of securing the insert to the body. [6]

## Section B

Answer **all** questions in this section.

You are advised to spend approximately **45 minutes** on this section.

- 2 (i) Briefly explain what is meant by the terms elasticity, ductility and malleability. [3]
- (ii) The ductility of a metal aids which **two** specific manufacturing processes? [2]
- 3 Knowledge of materials, anthropometrics and ergonomics are essential when designing products such as the ladder shown in **Fig. 6** on the insert sheet.
- (i) Briefly outline **one** main benefit of using aluminium alloy for the ladder. [1]
- (ii) Select **one** aspect of the ladder and briefly explain how the designer has considered ergonomics. [1]
- (iii) Briefly outline **two** specific types of anthropometric data that would be needed to help design the product. [2]
- 4 (i) Distinguish between permanent and semi-permanent methods used in the joining of materials. [1]
- (ii) Soldering, brazing and welding are used in the joining of metals.
- State **one** main characteristic for each of these methods which clearly distinguishes it from the other two. [3]

- 5 Plastic drainpipes are manufactured by the process of extrusion.
- (i) Suggest a suitable material for the extrusion process. [1]
  - (ii) State **two** main reasons why extrusion is the most suitable process for the manufacture of this product. [2]
  - (iii) With the aid of an annotated sketch, describe the extrusion process. [3]
- 6 European Kite marking, British Standards and the Trades Descriptions Act are intended to help the consumer.
- (i) Briefly explain what is meant by the term European Kite marking. [1]
  - (ii) Briefly outline **two** main benefits to the consumer associated with British Standards. [2]
  - (iii) Briefly outline **two** main benefits to the consumer associated with the Trades Descriptions Act. [2]
- 7 The role of the designer when designing products is to work closely with the client, user and manufacturer.
- (i) Give **two** main reasons why it is so important for the designer to establish a clear design specification with the client. [2]
  - (ii) Outline **two** examples of the type of information that the designer would need to establish from the user in order to produce designs. [2]
  - (iii) Outline **one** example of the type of information that the designer would need to establish from the manufacturer in order to produce designs. [1]

(for use with Question 1)



Fig. 1

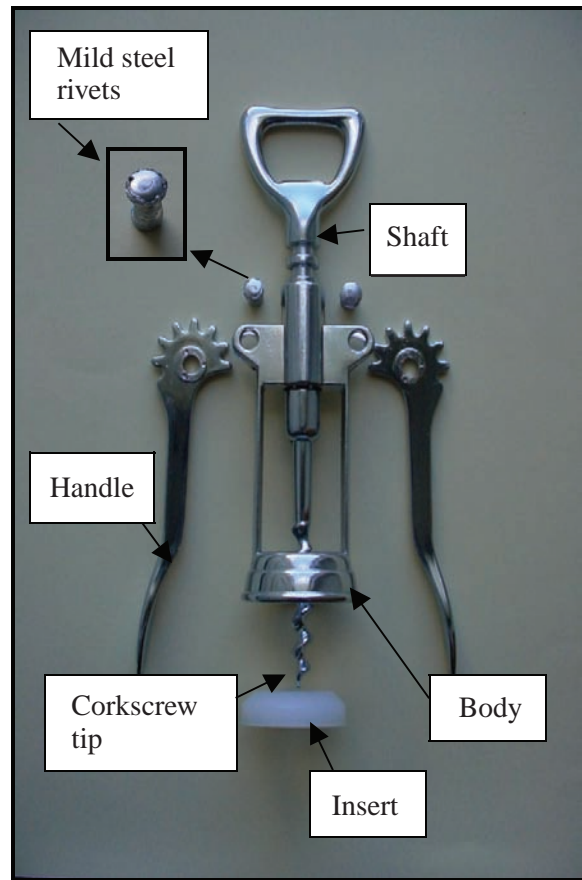


Fig. 2

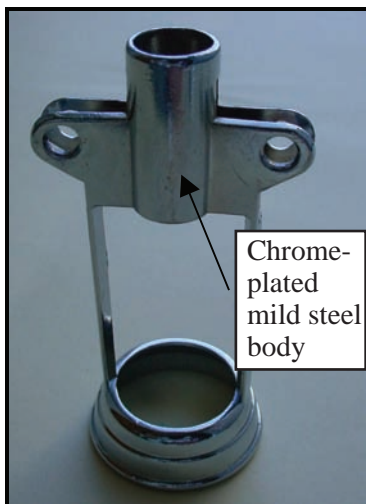


Fig. 3

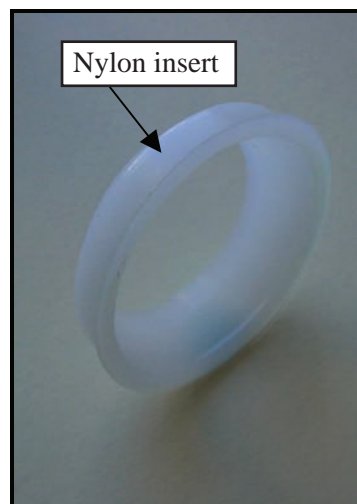


Fig. 4

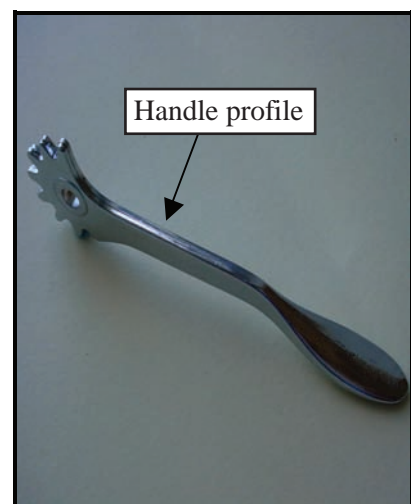


Fig. 5



(for use with Question 3)



Fig. 6