

**ADVANCED SUBSIDIARY GCE  
DESIGN AND TECHNOLOGY**

Unit 3: Product Design 1

**2520/02**

**QUESTION BOOKLET**

**Tuesday 19 May 2009  
Morning**

**Duration:** 48 minutes

This question booklet is to be retained in the Centre.

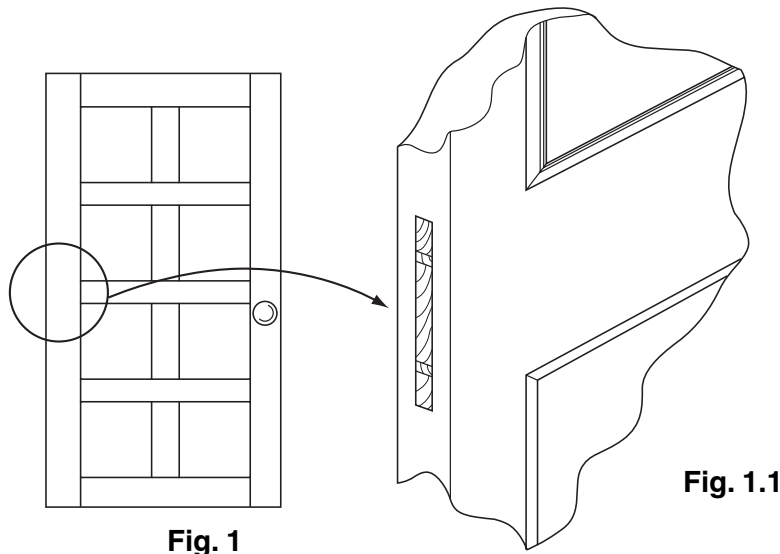
**INSTRUCTIONS TO CANDIDATES**

- You are required to answer **two** questions only.
- Write your answers in the 2520/02 answer booklet.

**INFORMATION FOR CANDIDATES**

- This document consists of **8** pages. Any blank pages are indicated.

**1** Fig. 1 shows a panelled door made from hardwood.



- (a) (i)** Name **two** common hardwoods suitable for the panelled door. [2]
- (ii)** Give **two** reasons why hardwood is appropriate for the panelled door. [2]
- (b)** Fig. 1.1 shows the detail of part of the frame of the door. Describe in detail how the mortise and tenon joint would be produced. Include details of how the panel would be fitted into the frame. Use sketches where appropriate. [8]
- (c)** Discuss the factors that influence the choice of surface finish on wooden products. [6]

**[Total: 18]**



2 Fig. 2 shows a bicycle made mainly from high performance metal alloys.

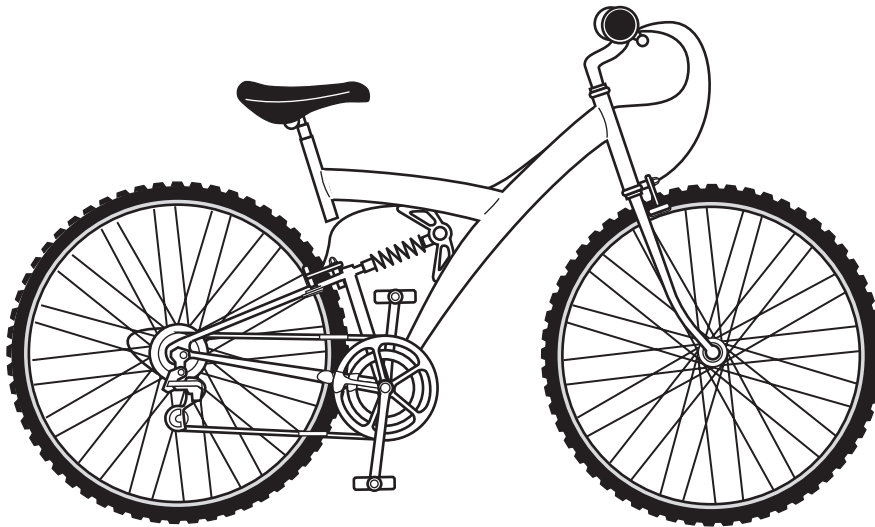
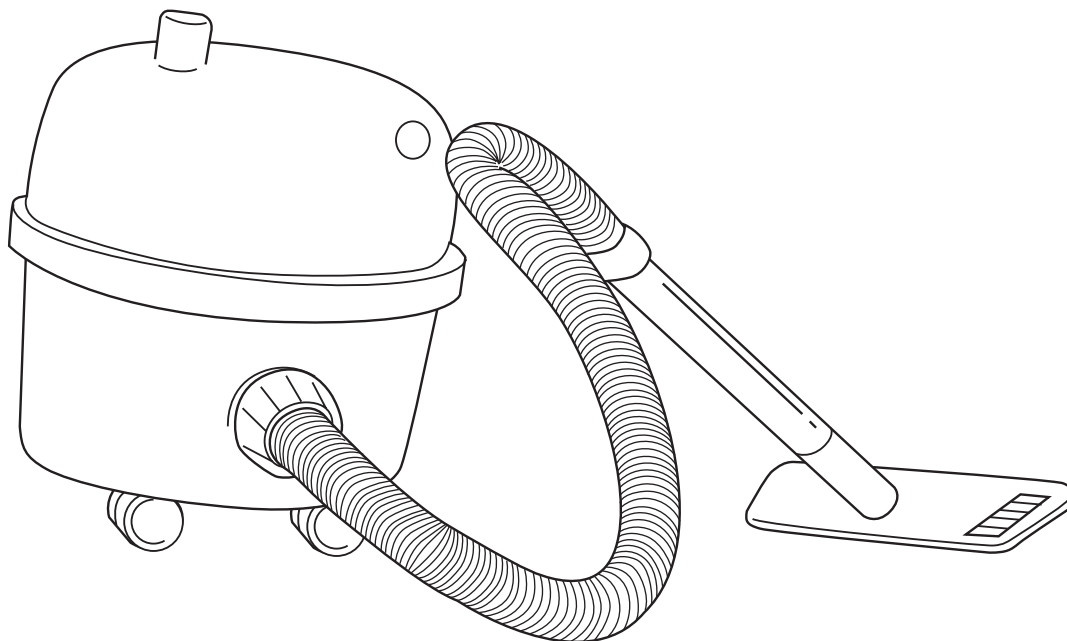


Fig. 2

- (a) (i) Name **two** common metal alloys. [2]
- (ii) Give **two** properties of high performance alloys used for bicycles. [2]
- (b) Many of the components on the bicycle are made by pressure die casting.
- Describe in detail the process of pressure die-casting. Use sketches where appropriate. [8]
- (c) Discuss the implications for the manufacturer of using standardised components. [6]

[Total: 18]

- 3 Fig. 3 shows a vacuum cleaner. The top half of the body is made from ABS and the lower half from polypropylene.



**Fig. 3**

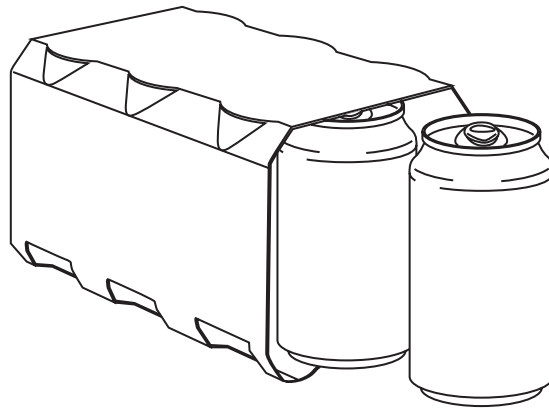
- (a) Give **two** properties of ABS that make it suitable for the top half of the vacuum cleaner body. [2]
- (b) Give **two** reasons why injection moulding is a suitable process for making both halves of the body. [2]

Both halves of the vacuum cleaner body are manufactured by injection moulding.

- (c) Describe in detail the process of injection moulding the top half of the vacuum cleaner body. Use sketches where appropriate. [8]
- (d) Discuss the factors that could influence a consumer when buying a new vacuum cleaner. [6]

**[Total: 18]**

- 4 Fig. 4 shows a cardboard carton used for a multi-pack of cans.



**Fig. 4**

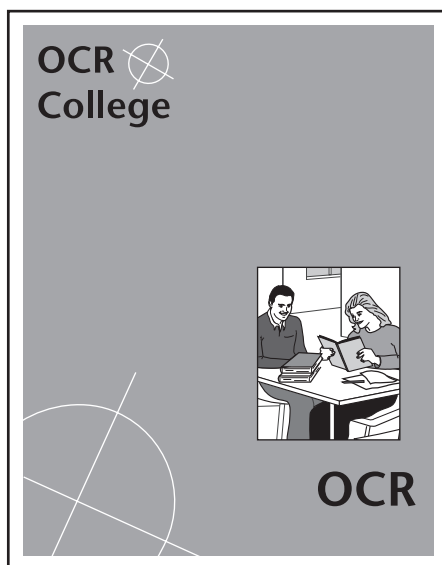
- (a) (i) Give **two** reasons why cardboard is a suitable material for the carton. [2]

The cardboard is described as being 225 gsm duplex bonded.

- (ii) Explain what is meant by the term 'gsm'. [2]
- (b) Describe in detail the commercial production of cardboard. [8]
- (c) Discuss the environmental implications of using multi-pack packaging for the consumer. [6]

**[Total: 18]**

5 Fig. 5 shows a leaflet.

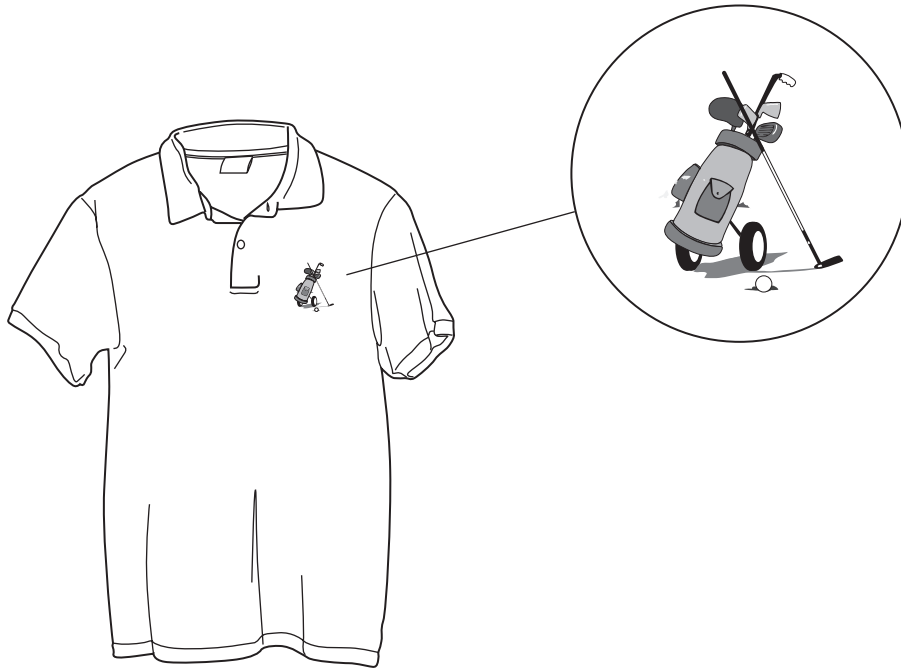


**Fig. 5**

- (a) The leaflet in Fig. 5 is printed using the 4 process colours CMYK.
- (i) State the meaning of the letters 'C' and 'M'. [2]
  - (ii) Give the **two** process colours that are combined to make the colour green. [2]
- (b) Describe, in detail, the main quality control checks that are carried out during colour print production.  
Use notes and sketches where appropriate. [8]
- (c) Discuss the importance of quality assurance to the manufacturer in commercial print production. [6]

**[Total: 18]**

- 6 Fig. 6 shows a polo shirt with an embroidered logo. The polo shirt is made from a knitted polyester cotton fabric.

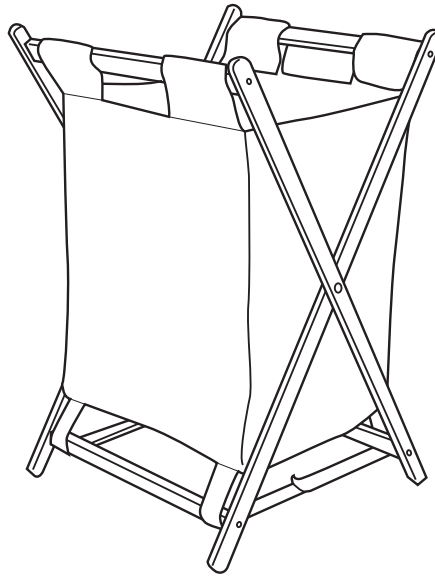


**Fig. 6**

- (a) Give **four** reasons why a knitted polyester cotton is a suitable fabric for the polo shirt. [4]
- (b) Describe how the logo would be embroidered on to the polo shirt using CAD/CAM. Use sketches where appropriate. [8]
- (c) Discuss the implications of using digital technologies in the manufacture of textile products. [6]

**[Total: 18]**

7 Fig. 7 shows a detachable laundry bag on a folding wooden frame.



**Fig. 7**

The manufacturing specification for this product states:

- seam tolerances of  $\pm 3$  mm;
- the laundry bag must be detachable;
- the fabric must be washable.

- (a) (i) Name **two** components that could be used to make the laundry bag detachable. [2]
- (ii) Give the meaning of the phrase seam tolerances of  $\pm 3$  mm. [2]
- (b) Describe, in detail, the sequence of manufacture of the detachable laundry bag. Do not include details of the wooden frame. Use sketches where appropriate. [8]
- (c) Discuss the implications of globalising textile product manufacture. [6]

**[Total: 18]**

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