

DESIGN AND TECHNOLOGY

9705/13

Paper 1

October/November 2019

3 hours

Additional Materials: Answer Booklet/A4 Paper
A3 Drawing Paper (2 sheets)
Extra sheets of A3 drawing paper for candidates who have used up both sides of their 2 sheets
A range of design drawing equipment

READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.

Write your name, centre number and candidate number on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil, or coloured pencils/pens as appropriate, for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Section A

Answer **one** question on the Answer Booklet/A4 Paper provided.

Section B

Answer **one** question on the Answer Booklet/A4 Paper provided.

Section C

Answer **one** question on plain A3 paper.

Use **both** sides of the paper.

You may request additional sheets of A3 paper, but only if you have used up both sides of each of the 2 sheets provided.

You are advised to spend **30 minutes** on each of Sections A and B and **2 hours** on Section C.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

All dimensions are in millimetres.

This document consists of **10** printed pages and **2** blank pages.

Section A

Answer **one** question from this section on the Answer Booklet/A4 paper provided.

- 1 Fig. 1.1 shows details of the development (net) of an A4 document folder used to keep papers flat and neat. The document folder is to be made in a school workshop. The folder is to be used to transport A4 documents to and from school.

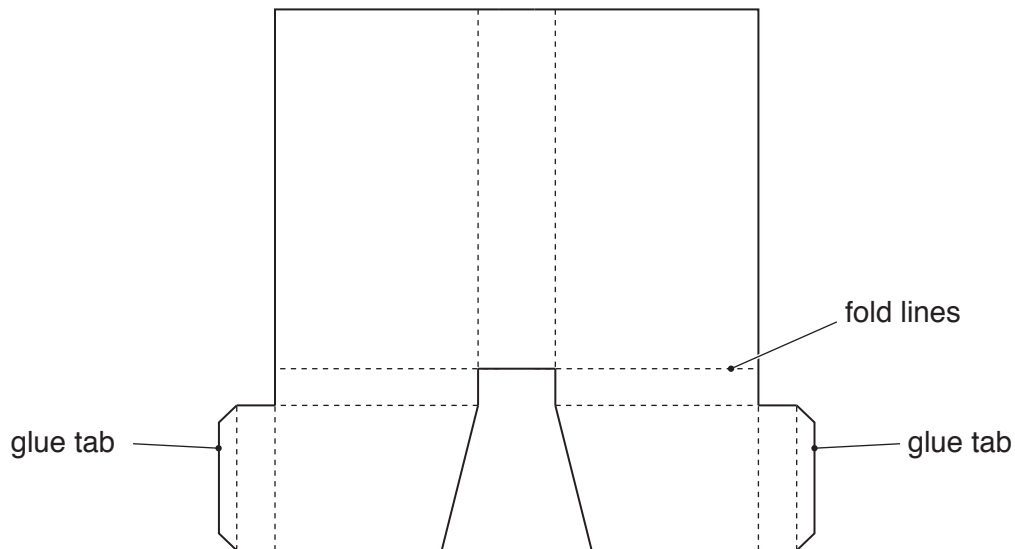


Fig. 1.1

- (a) State **two** materials that would be suitable to make the folder. [2]
- (b) Sketch a pictorial (3D) view of the fully assembled folder. [6]
- (c) Use notes and sketches to describe how the folder would be marked out, cut out and assembled. [6]
- You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.
- (d) Use notes and sketches to show how surface treatments and finishes can affect the potential to recycle products such as that shown in Fig. 1.1. [6]

2 Fig. 2.1 gives details of a stand to store hats, coats and umbrellas.

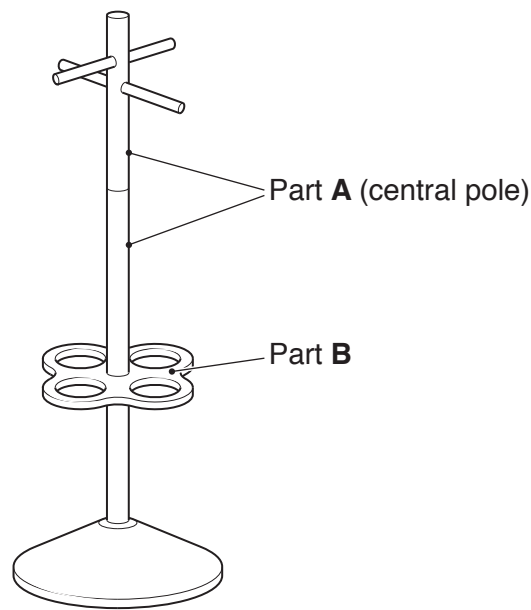


Fig. 2.1

(a) State **two** materials that would be suitable to make the central pole. [2]

(b) Use notes and sketches to describe:

(i) how the sections of Part **A** could be made and joined together [6]

(ii) how Part **B** could be made and attached to Part **A**. [6]

You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.

(c) Explain why products such as the stand shown in Fig. 2.1 are made in sections. [6]

- 3 Fig. 3.1 shows a table top mirror, which is to be made in a school workshop. The table top mirror is to be made from softwood and pivots to allow adjustment of the mirror.

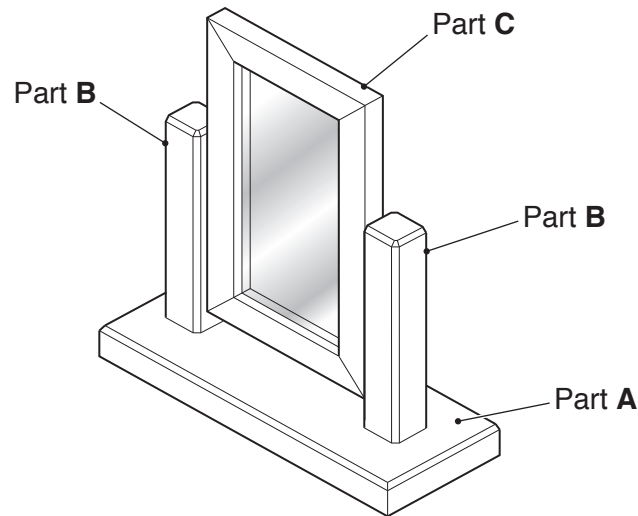


Fig. 3.1

- (a) Give **two** reasons why the softwood used in the table top mirror shown in Fig. 3.1 would be varnished. [2]
- (b) Use notes and sketches to describe:
- (i) how Part **A** could be made [6]
 - (ii) how **one** Part **B** could be made [6]
 - (iii) how Part **C** could be made to pivot. [6]

You must give details about the tools, equipment and processes involved and the safety precautions that have to be undertaken at each stage.

Section B

Answer **one** question from this section on the Answer Booklet/A4 paper provided.

- 4 Fig. 4.1 shows a free standing crowd barrier.

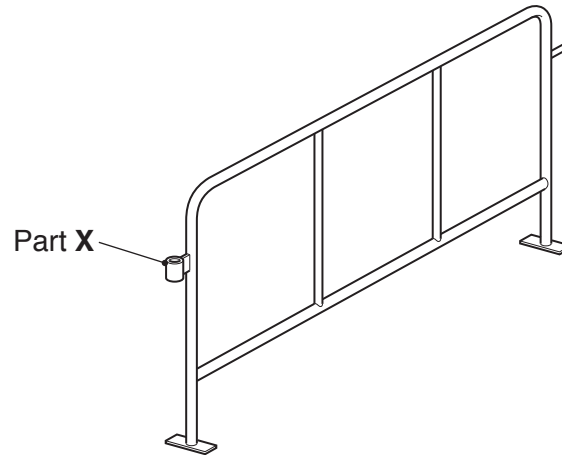


Fig. 4.1

- (a) Explain the function of Part X. [2]
- (b) Identify and describe **two** problems with the design of the barrier. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss the problems that are associated with the manufacture of a batch of identical products such as the barrier shown.

Your answer should:

- (i) analyse the given situation and identify **three** relevant issues raised by the question [3]
- (ii) explain why you consider these issues to be relevant [3]
- (iii) contain specific examples/evidence to support your conclusions. [2]

- 5 Fig. 5.1 gives details of a free self-assembly charity collection box used to collect donations.

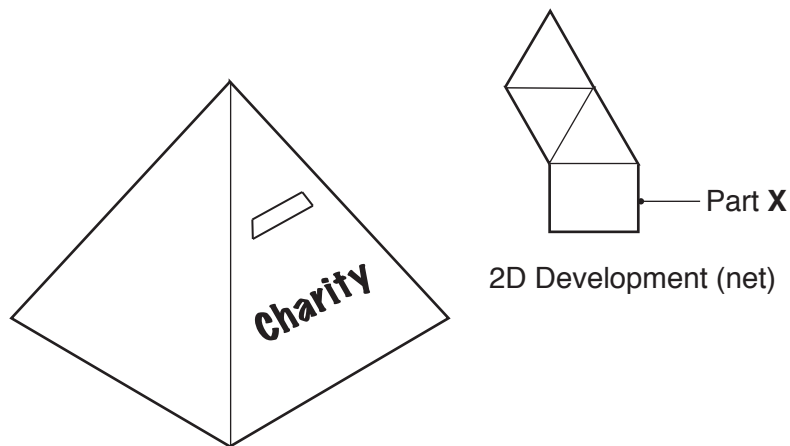


Fig. 5.1

- (a) Explain the function of Part X. [2]
- (b) Identify and describe **two** problems with the design of the charity collection box. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss the implications of adding processes such as embossing to a card product.

Your answer should:

- (i) analyse the given situation and identify **three** relevant issues raised by the question [3]
- (ii) explain why you consider these issues to be relevant [3]
- (iii) contain specific examples/evidence to support your conclusions. [2]

- 6 Fig. 6.1 shows an adjustable bench mounted drilling machine that can be found in a school workshop.

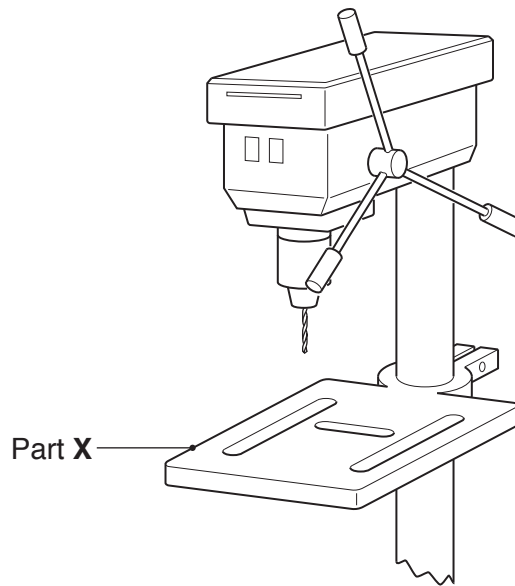


Fig. 6.1

- (a) Explain the function of Part X. [2]
- (b) Identify and describe **two** problems with the drilling machine. [4]
- (c) Using notes and sketches, explain how the design would need to be changed to overcome the **two** problems you have identified in **part (b)**. [6]
- (d) Discuss why health and safety is a crucial consideration within a school workshop and the importance of risk assessments in keeping students safe.

Your answer should:

- (i) analyse the given situation and identify **three** relevant issues raised by the question [3]
- (ii) explain why you consider these issues to be relevant [3]
- (iii) contain specific examples/evidence to support your conclusions. [2]

Section C

Answer **one** question from this section on the plain A3 paper provided.

You are provided with two sheets of plain A3 paper. You should use **both** sides of the paper. **Each** of the four parts **(a)–(d)** of the question you choose to answer should take up one side of paper.

When you are asked to **develop** a design you must show, using notes and sketches, the development and evaluation of a **range** of ideas into a single solution. The design proposal should be annotated to give details about materials, joining methods and important sizes.

7 Fig. 7.1 shows an incomplete idea for a folding barbecue.

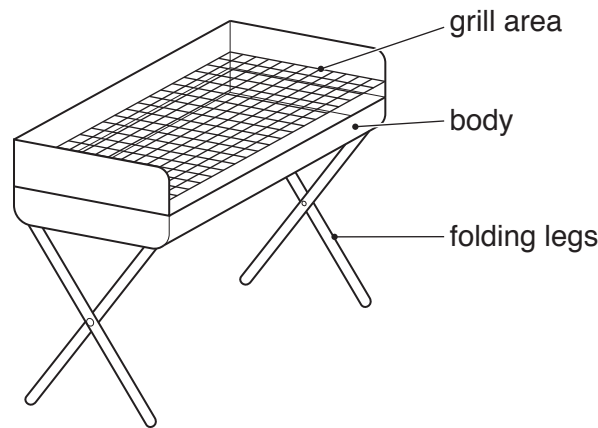


Fig. 7.1

- (a) Using notes and sketches, **develop** a design for the grill area of the barbecue. The design must include a method of adjustment to allow the grill to be set at different heights. [20]
- (b) Using notes and sketches, **develop** a design for the folding legs. The design must include methods that allow the legs to be securely attached to the grill area when the barbecue is in use and that allow the legs to be completely removed when the barbecue is not in use. [20]
- (c) Using notes and sketches, **develop** a design for a handle (or handles) which makes the barbecue easier to move when it is not being used. The design should protect the user from touching any hot parts of the barbecue. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete barbecue which shows all of the features that you have designed in **parts (a)–(c)**. The barbecue should be shown with the folding legs supporting the grill area. [20]

- 8 Fig. 8.1 shows an incomplete idea for a rear bicycle mudguard.

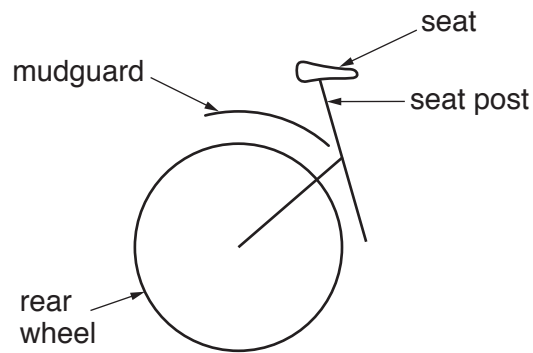


Fig. 8.1

- (a) Using notes and sketches, **develop** a design for the mudguard. The design must protect the rider from mud and water whilst cycling. [20]
- (b) Using notes and sketches, **develop** a design for adjusting the angle of the mudguard between the seat post and the rear wheel. The design must allow the mudguard to be set at a minimum of three different angles. [20]
- (c) Using notes and sketches, **develop** a design which can be attached to the mudguard that allows the bicycle to be more visible in poor weather conditions or after dark. The design should be waterproof. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete mudguard which shows all of the features that you have designed in **parts (a)–(c)**. [20]

- 9 Fig. 9.1 shows an incomplete idea for a suntan lotion container and a point of sale display.

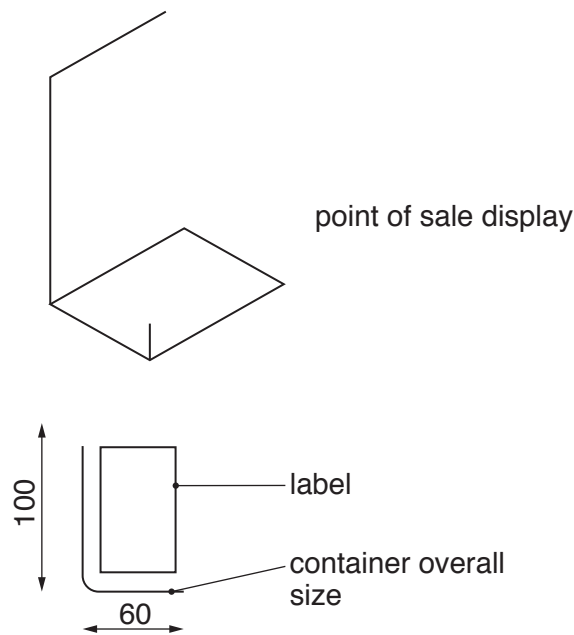


Fig. 9.1

- (a) Using notes and sketches, **develop** a design for a container to hold suntan lotion. [20]
- (b) Using notes and sketches, **develop** a design for the lettering and colour scheme for the label of the container. The name of the new suntan lotion range is 'Stay safe in the sun' and the lettering should be in a style that reflects the product being sold. [20]
- (c) Using notes and sketches, **develop** a design for a point of sale display to hold six containers of suntan lotion. [20]
- (d) Produce a pictorial (3D) rendered drawing of the complete point of sale display and one container which shows all of the features that you have designed in **parts (a)–(c)**. [20]

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