OCR
RECOGNISING ACHIEVEMENT

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1959/02

GENERAL CERTIFICATE OF SECONDARY EDUCATION

DESIGN & TECHNOLOGY

Industrial Technology

Paper 2 (Higher Tier)

MONDAY 2 JUNE 2008

Morning

Time: 1 hour 15 minutes

Candidates answer on the question paper

Additional materials: No additional materials are required

CUP/T41233

Candidate Forename		Candidate Surname	
Centre Number		Candidate Number	

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

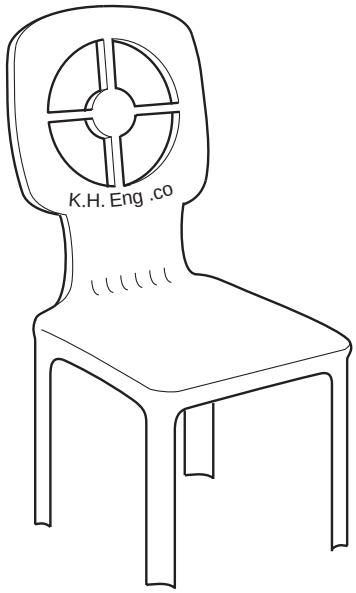
- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **50**.
- All dimensions are in millimetres.
- Assume any mechanical system to be 100% efficient.

FOR EXAMINER'S USE	
1	
2	
3	
4	
5	
TOTAL	

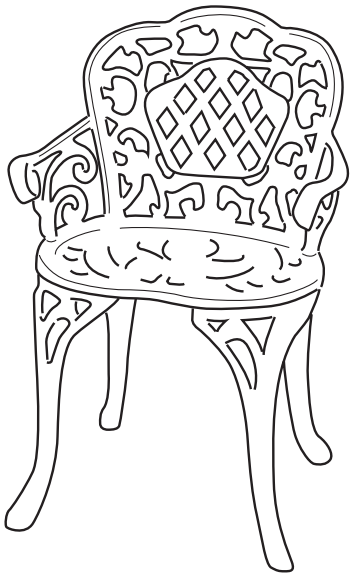
This document consists of **15** printed pages and **1** blank page.

[Turn over

1 Fig. 1 shows two garden chairs.



Chair **A**
made from HD polypropylene



Chair **B**
made from cast aluminium alloy

Fig. 1

(a) Give **two** benefits to the user of chair **A**.

Benefit 1 .....[1]

Benefit 2 .....[1]

(b) State a suitable method of manufacture for chair **A**.

.....[1]

(c) In use chair **A** is found to be unsatisfactory:

- the chair back bends backwards;
- the legs push into the ground.

Use sketches and notes to show how these faults can be overcome.

[4]

(d) Give **one** suitable finish, other than painting, for chair **B**.

.....[1]

(e) The manufacturer of chair **B** intends to personalise the chair back for a client.

Fig. 2 shows an example of a sand cast plaque.

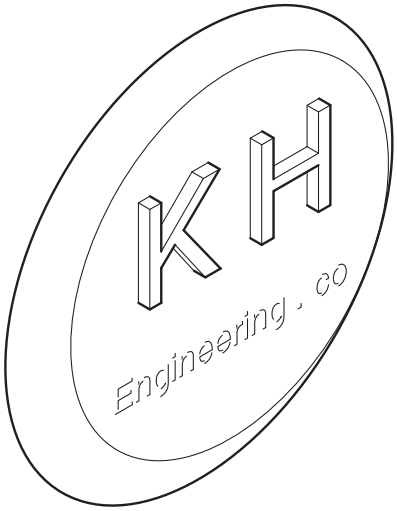


Fig. 2

Give **two** important features of a sand casting pattern.

Feature 1 .....[1]

Feature 2 .....[1]

[Total: 10]

2 Fig. 3 shows a self assembly child's swing.

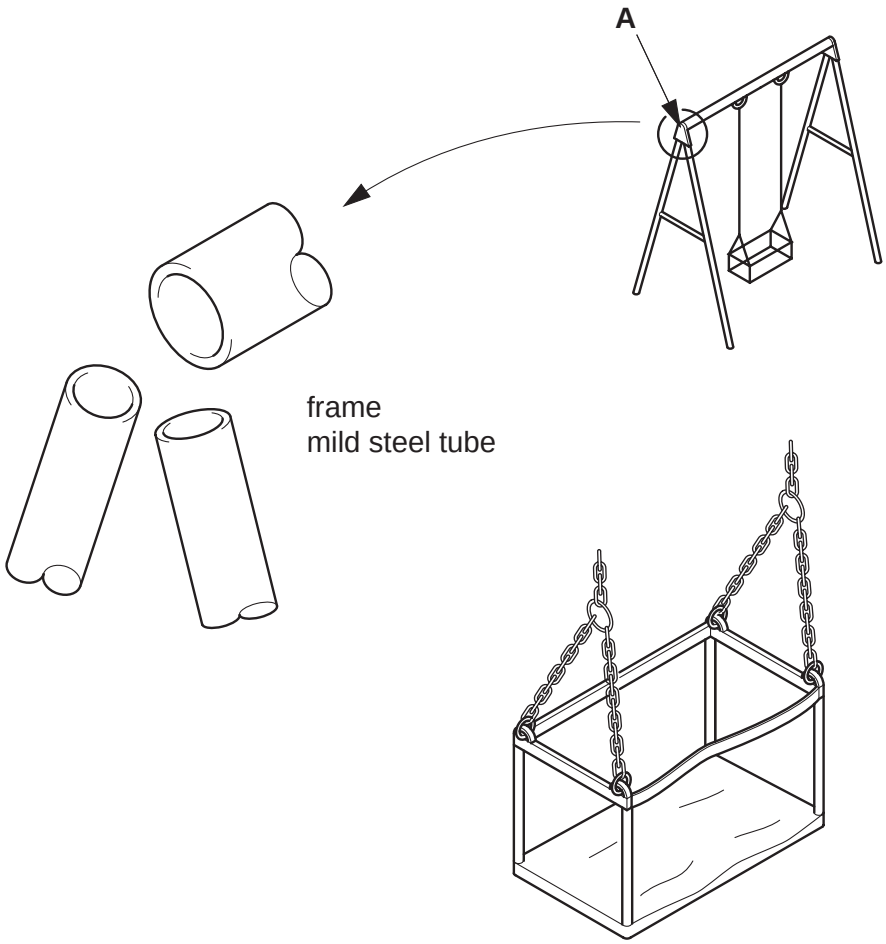


Fig. 3

(a) Complete the design specification for the swing seat suitable for a 2–3 year old child.

The design must be:

1 simple and easy for the parent to fit the child in.

2 .....

3 .....

4 .....[3]

(b) The assembly drawings are produced on a CAD package.

Give **two** reasons why manufacturers store drawings electronically.

Reason 1 .....

.....[1]

Reason 2 .....

.....[1]

(c) Use sketches and notes to show how the parts could be joined at **A** so that:

- they can be easily assembled;
- the structure is safe;
- the structure remains rigid;
- the parts can be disassembled.

[5]

[Total: 10]

3 Fig. 4 shows details of the netting tracks dividing a sports hall playing area.

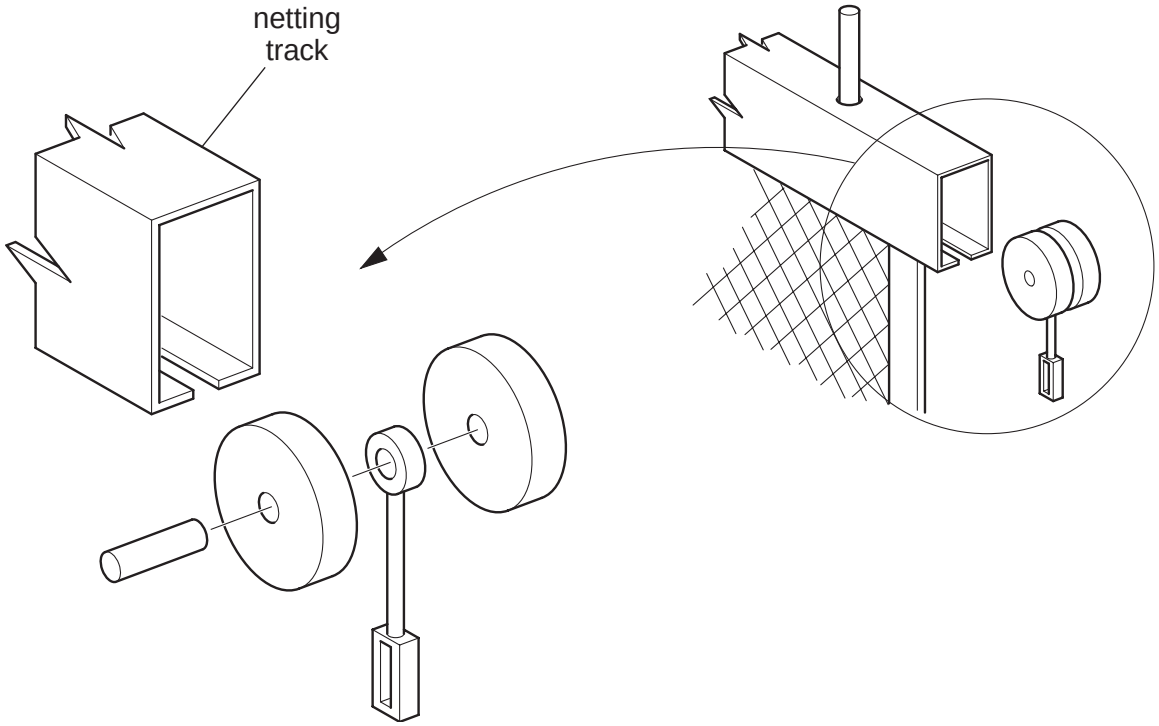


Fig. 4

(a) Name the manufacturing process used to produce the netting track.

.....[1]

(b) Name a suitable plastic for the wheel assembly.

.....[1]

(c) The wheels are made by the injection moulding process.

Use sketches and notes to show the key features of an injection mould.

[3]

(d) Fig. 5 shows the netting track and a sports hall roof beam.

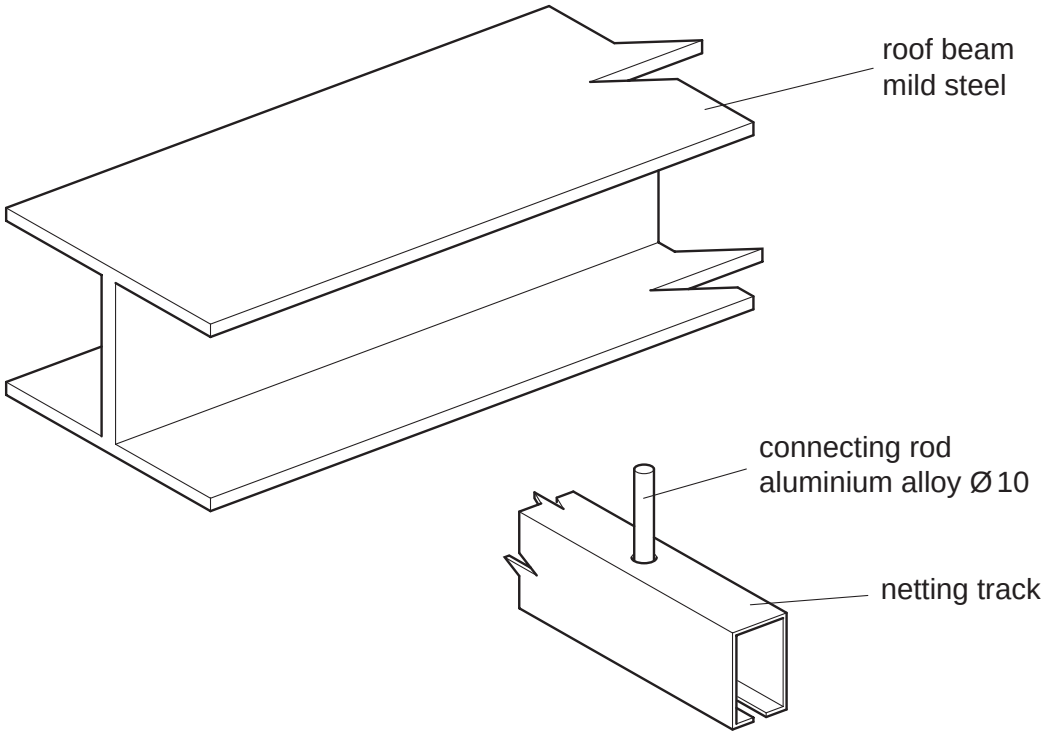


Fig. 5

The supplier of the netting track has not provided a means of fixing it to the roof beams.

Use sketches and notes to show a method of fixing the netting track to the roof beams.

The design must:

- be removable;
- not require any holes to be drilled into the roof beams;
- hold the netting tracks in place;
- be adjustable to allow for the different positions.

Use this page for your answer to part (d).

[5]

[Total: 10]

4 Fig. 6 shows a mechanically operated crane.

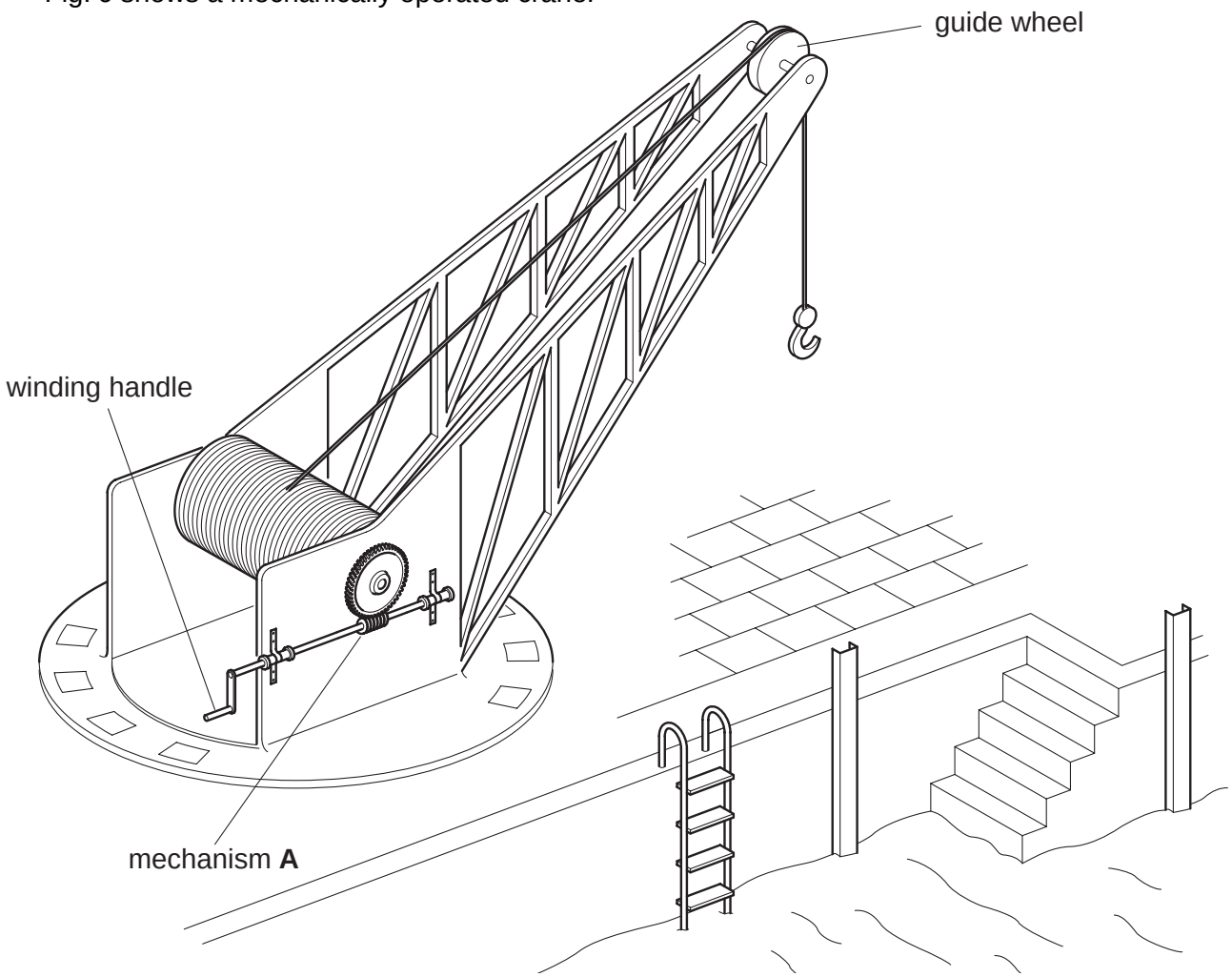


Fig. 6

(a) Fig. 7 shows the mechanism at **A** used to operate the winding drum.

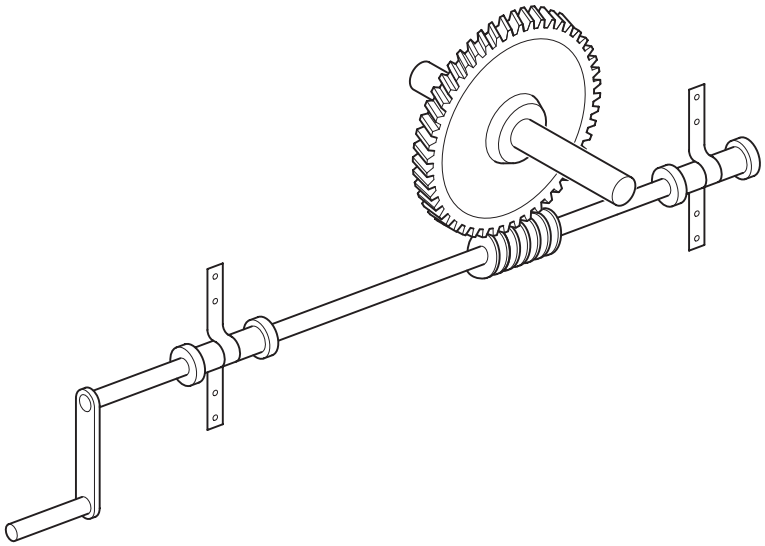


Fig. 7

(i) Name mechanism **A**.

.....[1]

(ii) Give **two** reasons why the mechanism is suitable for the application.

Reason 1 .....[1]

Reason 2 .....[1]

(b) Use sketches and notes to show a modification that could reduce friction between the winding handle and the user.

[3]

(c) In constant use the axle hole on the guide wheel has become enlarged.

Fig. 8 shows a cross section of the axle, bush and guide wheel.

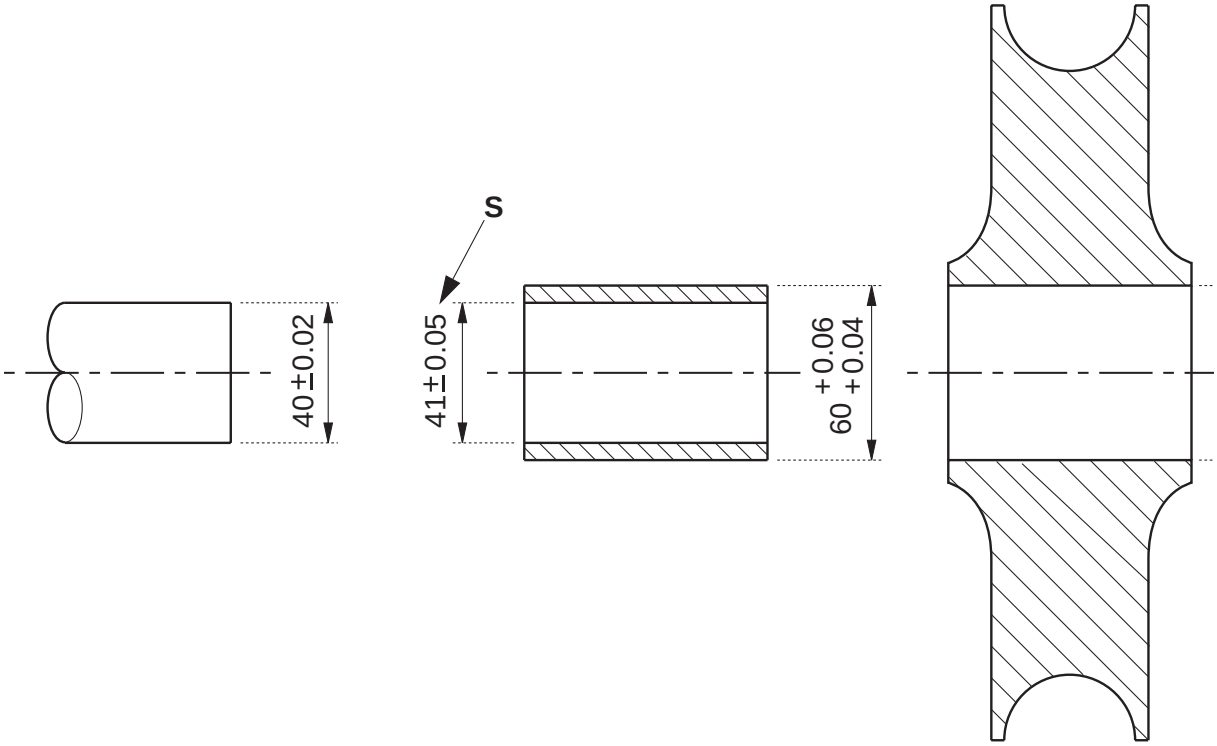


Fig. 8

(i) Explain the term interference fit.

.....

.....

.....[2]

(ii) Explain what the figures at **S** mean.

.....

.....

.....[2]

[Total: 10]

5 Fig. 9 shows a 13 amp 3 pin plug. The pins are made from an alloy.

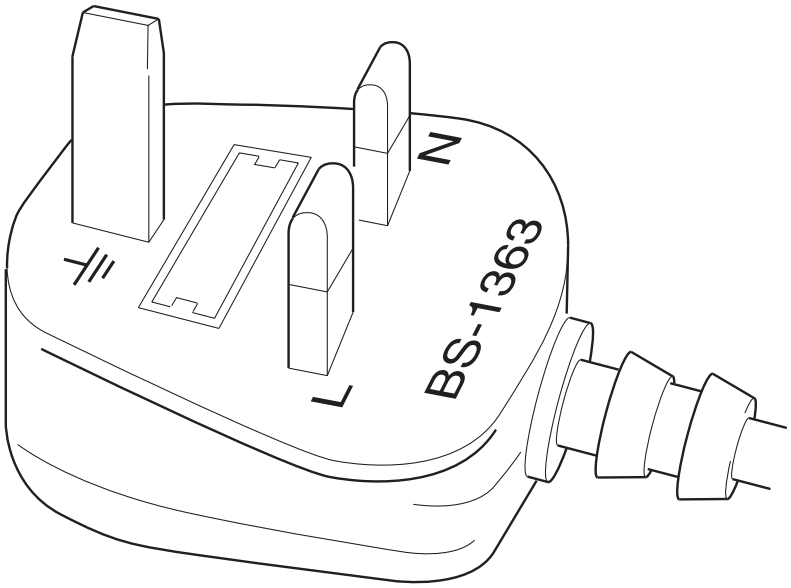


Fig. 9

(a) Give the definition of the term 'alloy'.

.....[1]

(b) Give **three** reasons why metals are alloyed.

Reason 1 .....[1]

Reason 2 .....[1]

Reason 3 .....[1]

(c) On the plug casing **BS 1363** can be found.

Explain what this means.

.....

.....

.....[2]

(d) Fig. 10 gives details related to the production of the pin for an electric plug.

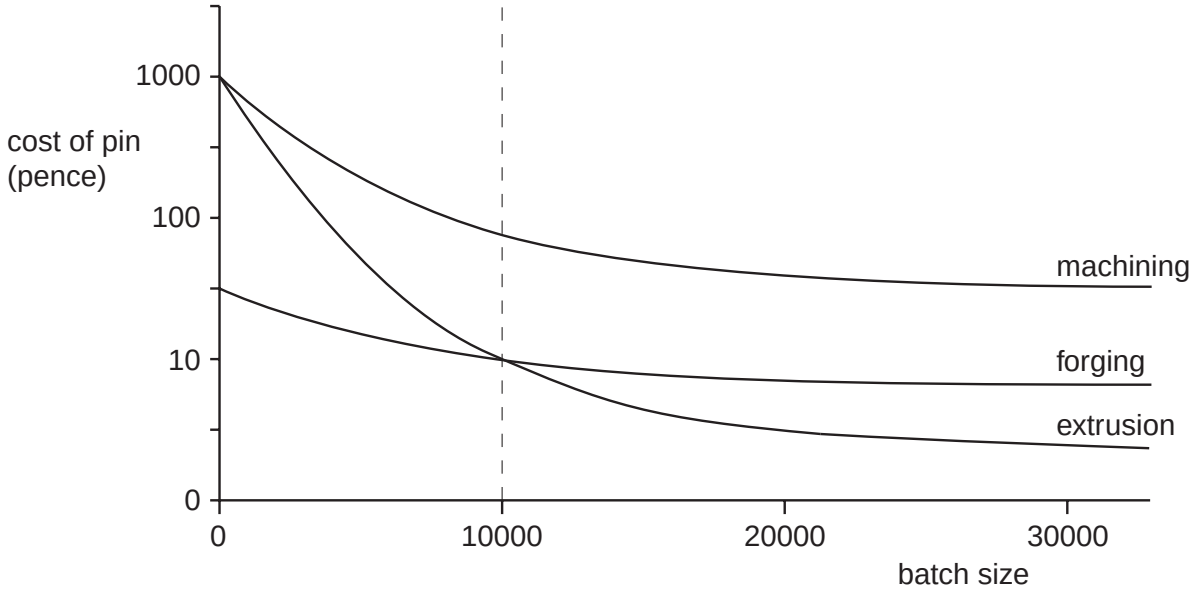


Fig. 10

Give **one** reason why the machining costs are higher than those for forging or extrusion.

.....[1]

(e) State which is the most cost effective method of production for volumes of less than 10,000 units.

.....[1]

(f) Give **two** fixed costs in all methods of production shown in the graph.

.....

.....[2]

[Total: 10]

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