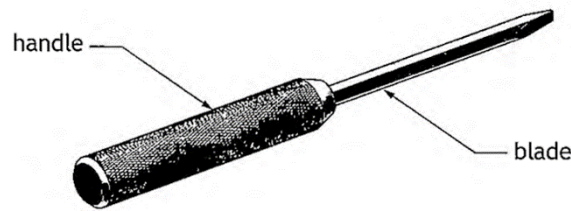


Candidate 2 evidence

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Total marks — 60
Attempt ALL questions

1. A handmade screwdriver, made of two separate parts, is shown below.



The blade is made from high carbon steel. High carbon steel is a ferrous metal.

(a) Explain what is meant by the term 'ferrous metal'. 1

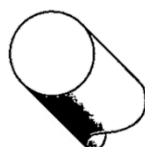
ferrous metal is metal
that contains iron


(b) State one property of high carbon steel that makes it suitable for the screwdriver blade. 1

it is vely durable

When material is delivered to a metal workshop, it comes in a range of sections.

(c) Name each of the two common sections shown below.

(i)  cross 1

(ii)  cross 1

1. (continued)

(d) The screwdriver blade was hardened and then tempered.

(i) Describe the process of **hardening** the screwdriver blade.

3

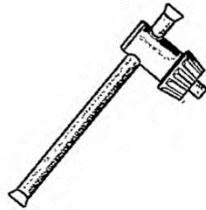
Place the blade into a hot surface until red/yellow then remove the blade and let it cool down slowly. This is called annealing

(ii) Explain the effect of **tempering** the screwdriver blade.

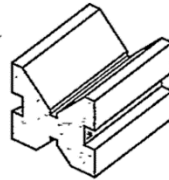
1

it strengthens the steel making it more durable

The tools shown below were used during the manufacture of the screwdriver handle.



Tool A



Tool B

(e) Name each of the tools shown.

(i) Tool A chuck key

1

(ii) Tool B _____

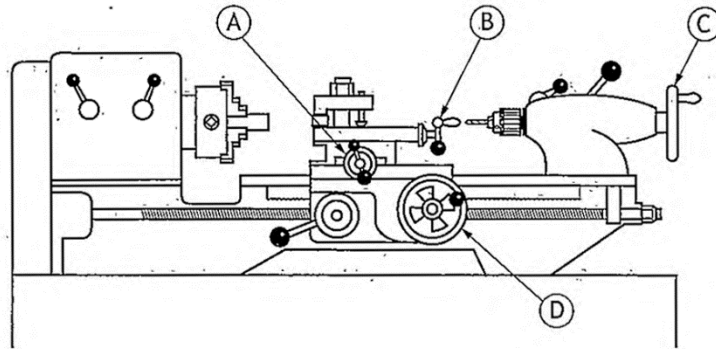
1

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1. (continued)

The machine shown below was used in the manufacture of the screwdriver handle.



(f) Name this machine.

1

metal lathe

(g) Describe three safety checks that should be carried out on this machine before switching it on.

3

1 check that the chuck key has been removed

2 the material is secure in the chuck

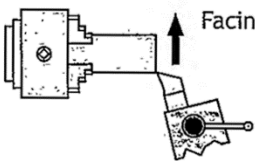
3 ~~the lathe is in correct gear~~
the lathe is in correct gear

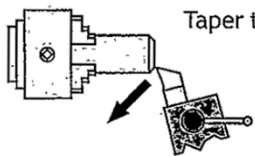
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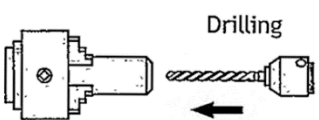
1. (continued)

Handles A, B, C and D, shown on the machine opposite, were used during the manufacture of the screwdriver.

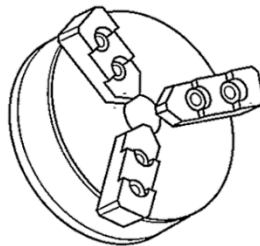
(h) Identify the correct handle to use when carrying out the processes shown below.

(i)  Facing off Handle _____ 1

(ii)  Taper turning Handle _____ 1

(iii)  Drilling Handle _____ 1

A 3-jaw chuck for holding the handle is shown below.



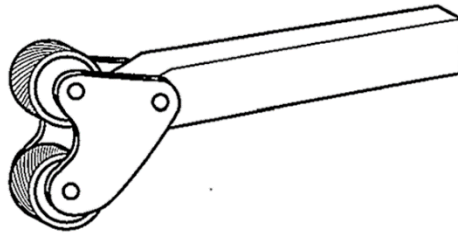
(i) State the feature of a 3-jaw chuck which makes it suitable for holding the screwdriver handle. 1

the 3 jaws make it suitable
to hold round objects

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1. (continued)

The knurling tool, shown below, was used during the manufacture of the screwdriver handle.



- (i) State two procedures that ensure a high quality finish is achieved when knurling.

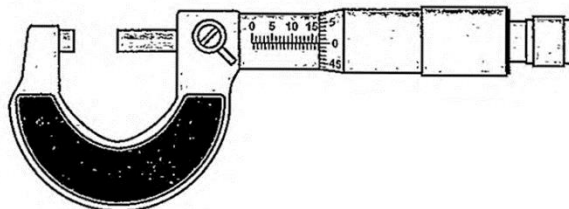
2

- 1 the material is turning at
a consistent speed
- 2 the knurling tool is
sharp enough

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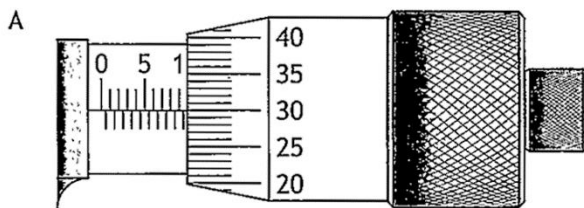
1. (continued)

The micrometer, shown below, was used to check diameters during the manufacture of the screwdriver handle.

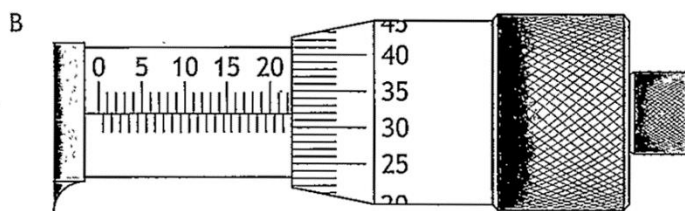


Two readings from the micrometer are shown below.

(k) State the correct readings.

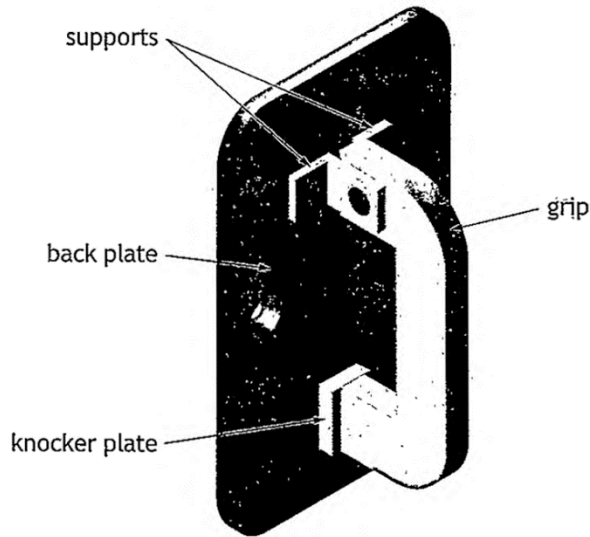


(i) Reading A 9.80 1

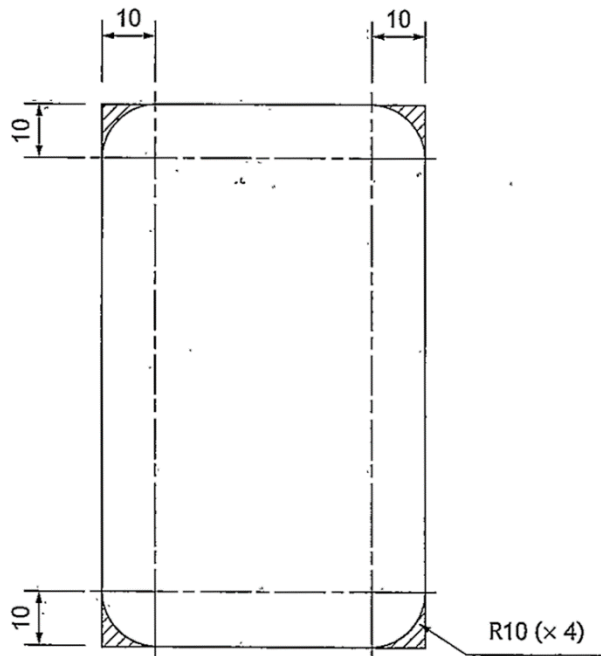


(ii) Reading B 22.82 1

2. A handmade door knocker is shown below.



The back plate has to be marked out, as shown on the drawing below.



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2. (continued)

- (a) (i) Describe how to accurately mark the R10 on the corners of the back plate.

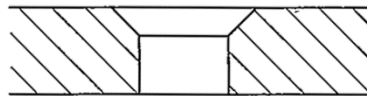
5

You must make reference to all tools, processes and relevant dimensions.

You may use sketches to support your answer.

you set odd leg calipers to 10 then mark down each side (use steel rule to set odd leg calipers) then use a centre punch by punching a small hole into the corners you just marked then use dividers to mark the rounded edge you do this by setting the dividers to 10 then line up the hole you punched with the dividers then mark the rounded line onto the metal

A cross section of the back plate showing the hole for a countersink screw is shown below.



- (ii) Explain the purpose of using a countersink screw.

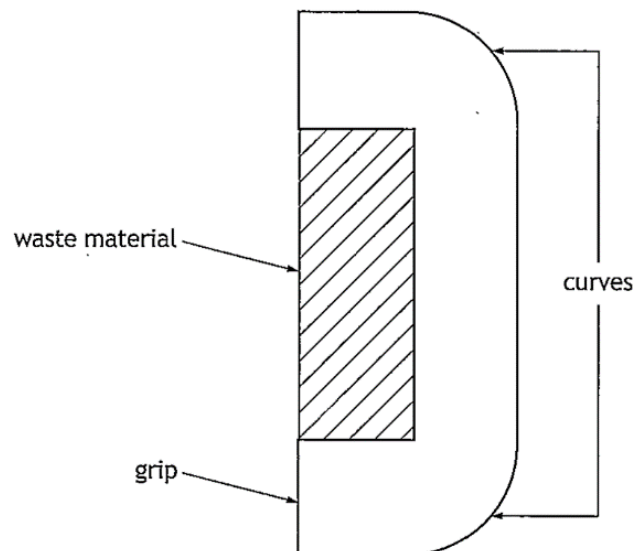
1

to make sure the
screw is flush

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2. (continued)

This drawing shows how the grip was marked out, prior to removing the waste material.



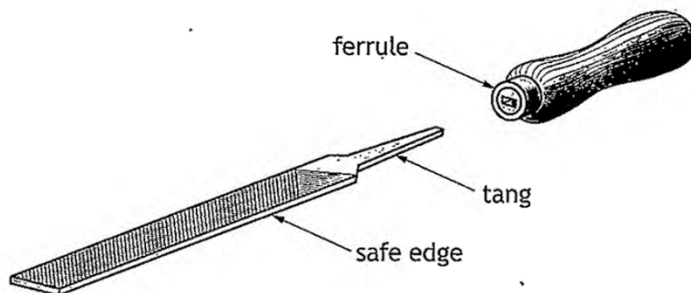
- (b) (i) Describe how to remove the waste material. 3
You must make reference to all tools and processes.
You may use sketches to support your answer.

you must use a pillar drill
to drill a few holes into
each corner so that a
hacksaw blade can get through
to cut the waste material

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2. (b) (continued)

A flat file was used to shape the curves. Parts of a flat file are shown below.



(ii) State the purpose of the following parts of the flat file.

3

Ferrule is to stop the wood
expanding

Tang is to allow the blade
to ~~have~~ have support

Safe edge to ensure that no
scratches are made on
material

[Turn over

2. (continued)

The supports are joined to the back plate using rivets.



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(c) Name the types of rivet shown below.



Rivet type snap head rivet 1



Rivet type round head rivet 1



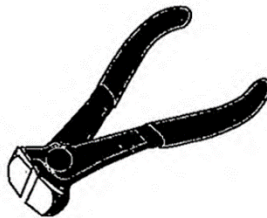
Rivet type slot head rivet 1

2. (continued)

The tools shown below are used during riveting.



Tool A



Tool B

(d) (i) Name Tool A.

rivet block

1

(ii) Explain what Tool B is used for.

to shorten the length
of the rivets

1

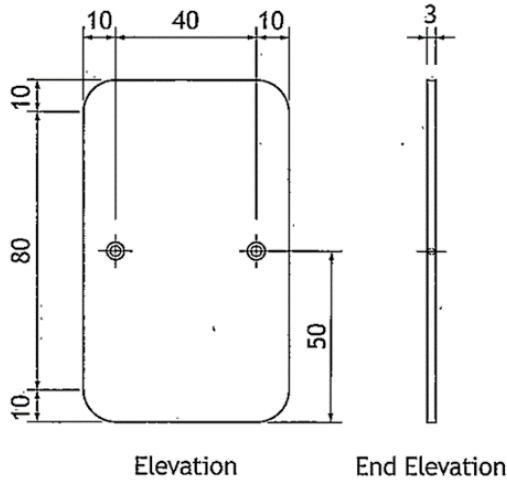
[Turn over

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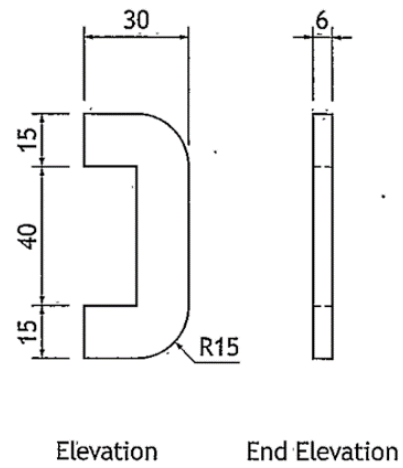
2. (continued)

The working drawings for the door knocker are shown below.

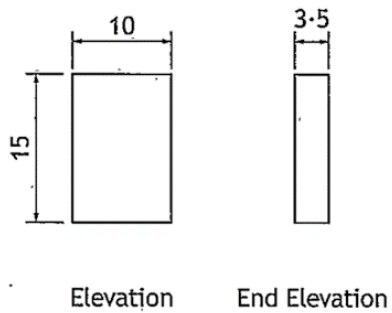
Back plate



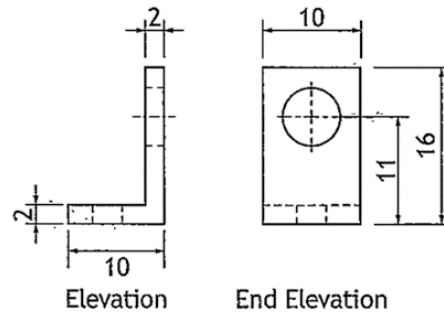
Grip



Knocker plate



Support



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2. (continued)

(e) Using the information from the drawings shown opposite, complete the cutting list shown below.

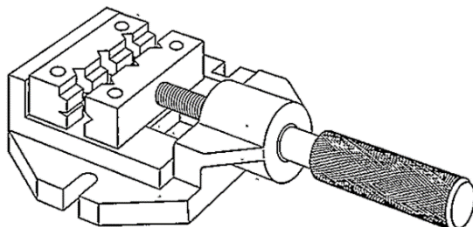
4

Part	Number	Material	Length	Breadth	Thickness
Back plate	1	Mild steel	100	60	3
Grip	1	Mild steel	70	30	6
Support	2	Mild steel	26	10	2
Knocker plate	1	Mild steel	15	10	3.5

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2. (continued)

The tool, shown below, was used in the manufacture of the door knocker.

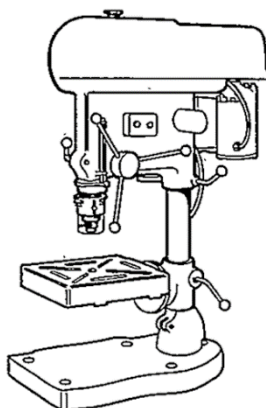


(f) Name this tool.

1

Machine vice

The machine, shown below, was used in the manufacture of the door knocker.



(g) Name this machine.

1

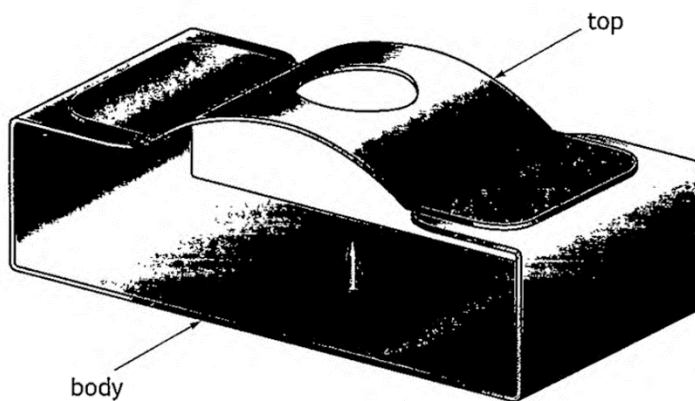
Pillar drill

(h) Explain why work areas and floors around machinery should always be kept clean and dry.

1

it will reduce hazards
and accidents

3. A candle holder is shown below.



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The candle holder was made from recycled metal.

(a) (i) State why it is important to use recycled metal whenever possible. Give two reasons.

2

Reason 1 it prevents waste

Reason 2 it is cost efficient

(ii) Describe a test that would distinguish between mild steel and aluminium as part of the recycling process.

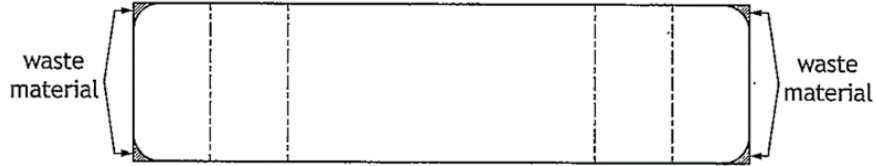
1

Using magnets to separate the mild steel

[Turn over

3. (continued)

The body, shown below, was made from 1mm mild steel sheet.



- (b) Name a hand tool that can be used to remove the waste material before finishing with a file.

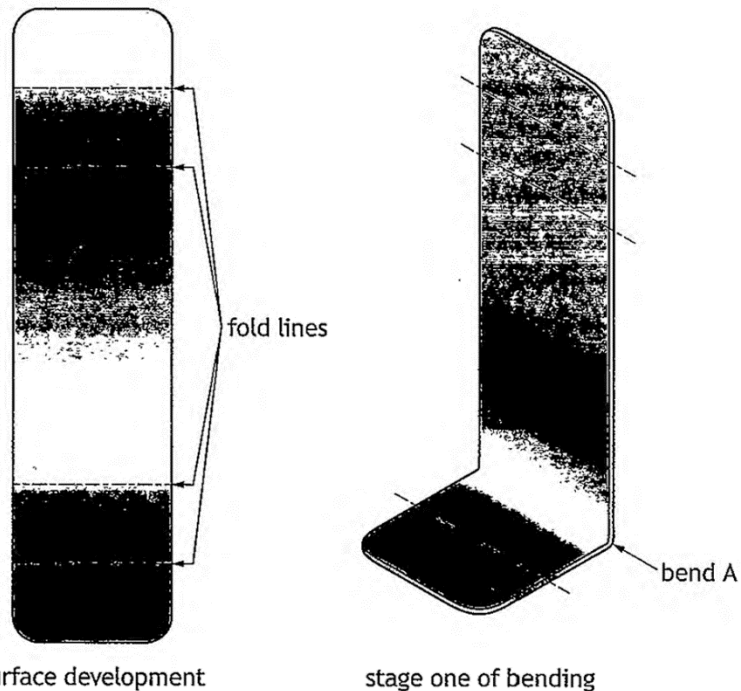
hack saw

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1

3. (continued)

The surface development and stage one of bending the body are shown below.



surface development

stage one of bending

- (c) Describe, using correct terminology, how bend A is formed.
You may use sketches to support your answer.

2

using a Gublo to bend it
you would line up bend A
with the bending bar and
secure it then pull the
level up to bend it

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3. (continued)

The top of the candle holder is shown below.



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- (d) Explain why the hole is drilled in the top before bending it to shape. 1

it would be harder to clamp down bent

It was decided to make a pair of candle holders.

- (e) State a method of ensuring that both tops are bent to the same shape. 1

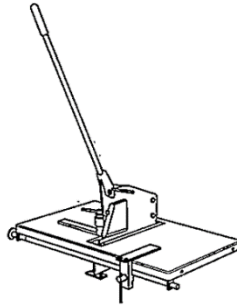
use a template

- (f) State one health and safety precaution that should be taken when working with sheet metal. 1

Sharp edges

3. (continued)

The tool shown below is used when working with sheet metal.



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(g) Name this tool.

1

Bulitine

(h) Describe two stages of preparing sheet metal for a finish.

2

1. making the edges smooth

2. _____

(i) State a suitable finish which could be applied to sheet metal.

1

Spray laquer

(j) Explain why blunt tools can be just as hazardous as sharp tools.

1

if you were to be injured with a blunt tool the damage ~~would~~ would be more severe as oppose to a sharp tool which would be a cleaner cut

[END OF QUESTION PAPER]