EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

DESIGN AND TECHNOLOGY **6902/03**

Paper 3 Resistant Materials **October/November 2020**

1 hour

Candidates answer on the Printed Question Paper.

Additional Materials: Standard Drawing Equipment

To be taken together with Paper 1 in one session of 2 hours 15 minutes.

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do **not** use staples, paper clips, glue or correction fluid.

Section A
Answer **all** questions in this section.

Section B
Answer **one** question in this section.

You may use an electronic calculator.
Total marks for this paper is 50.
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.

For Examiner's Use	
Section A	
Section B	
Total	

This document consists of **16** printed pages.

Section A

Answer **all** questions in this section.

1 Name any safety equipment that should be worn when brazing.

..... [1]

2 Fig. 1 shows two tools being used to mark out the centre of a metal rod.

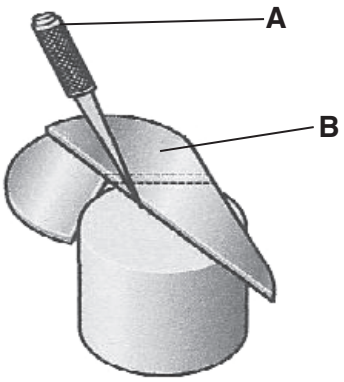


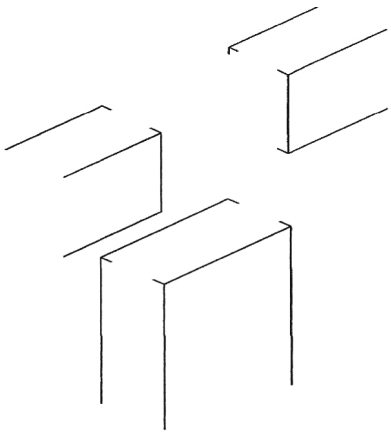
Fig. 1

Name tools **A** and **B** shown in Fig. 1.

A ..... [1]

B ..... [1]

3 Complete the sketch in Fig. 2 below to show a tee bridle joint.



[3]

Fig. 2

4 Fig. 3 below shows part of a car rear light unit.

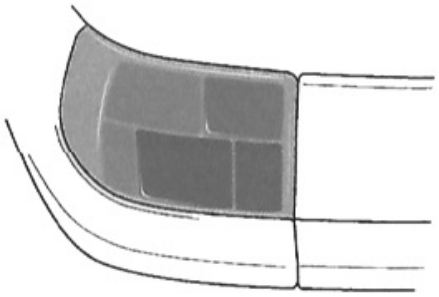


Fig. 3

(a) Name a suitable plastic for the rear lighting unit.

..... [1]

(b) Give **two** properties of the plastic that make it suitable for the rear lighting unit.

1. ..... [1]

2. ..... [1]

5 Fig. 4 below shows a butt joint being glued and nailed.

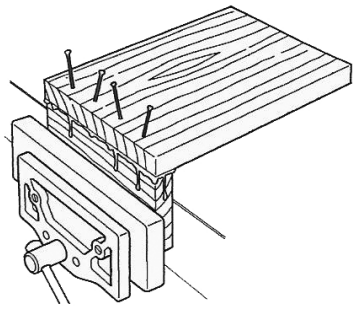


Fig. 4

(a) Name the method of nailing shown in Fig. 4.

..... [1]

(b) Give **one** reason why the nails are driven at an angle.

..... [1]

(c) Name a tool that could be used to drive the nails below the surface of the wood.

..... [1]

6 Fig. 5 below shows a method of filing.

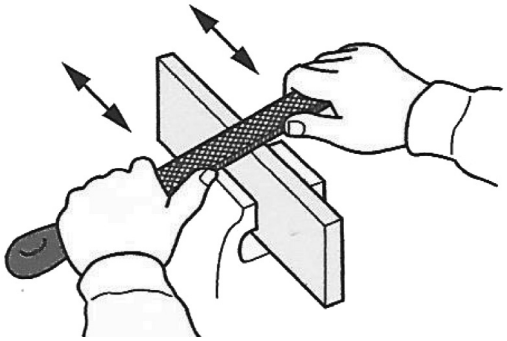


Fig. 5

(a) Name the method of filing shown in Fig. 5.

..... [1]

(b) State the purpose of the above method of filing as shown in Fig. 5.

..... [1]

7 Knurled surfaces are produced on tools such as a scribers and centre punches.

(a) Explain the purpose of a knurled surface.

..... [1]

(b) Name **one** machine and **one** tool used to produce knurled surfaces.

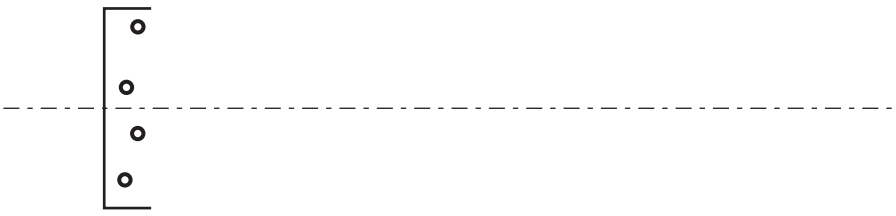
Machine ..... [1]

Tool ..... [1]

(c) Name **one** marking out tool which has some knurling pattern on it.

..... [1]

8 Complete the sketch in Fig. 6 below to show a tee hinge



[2]

Fig. 6

9 Complete the table below by naming a suitable adhesive and stating one use.

Uses	Adhesive
Wooden boat building	
	Epoxy resin
Gluing plastic laminate to a manufactured board table top	

[3]

10 Fig. 7 below shows a small plastic bowl.

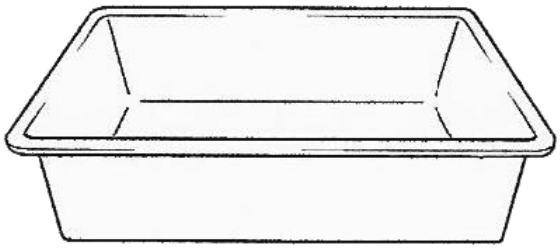


Fig. 7

(a) Name a process that could be used to produce the bowl in a school workshop.

..... [1]

(b) Name a suitable plastic from which the bowl could be made using the process named in part **(a)**.

..... [1]

[Turn over

For Examiner's Use

Section B

Answer **one** question in this section.

11 Fig. 8 below shows a play table for children.

The play table is made from 18 mm thick MDF and supplied as a flat-pack for self-assembly.

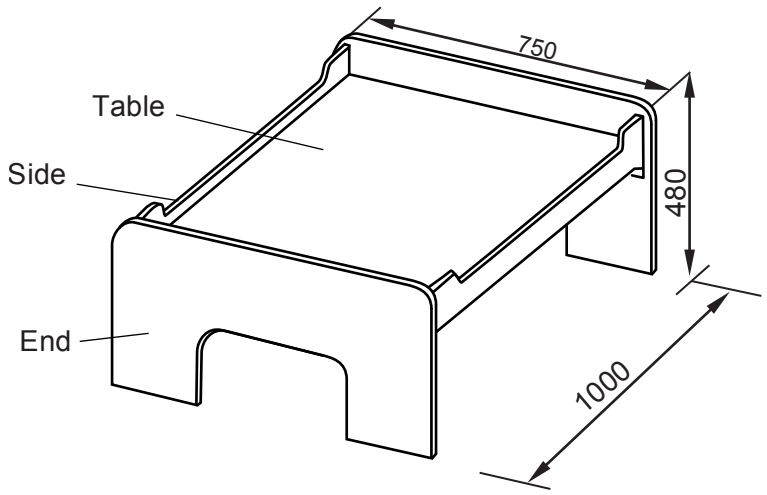


Fig. 8

(a) Describe **two** features of the design of the play table that makes it suitable for children 3–6 years of age.

Feature 1 ..... [1]

Feature 2 ..... [1]

(b) (i) Give **two** benefits of using a template to mark out the shapes of the sides and ends.

Benefit 1 ..... [1]

Benefit 2 ..... [1]

(ii) Name **one** electrical power saw that could be used to cut out the shapes of the sides and ends.

..... [1]

(c) (i) State **two** benefits of using MDF for the play table.

Benefit 1 ..... [1]

Benefit 2 ..... [1]

(ii) The sides and the ends of the play table will be finished by spray painting.

Give **two** advantages of spray painting rather than applying the paint with a brush.

Advantage 1 ..... [1]

Advantage 2 ..... [1]

(d) The table top will be covered with a plastic laminate.

Give **two** reasons for covering the table top with a plastic laminate.

Reason 1 ..... [1]

Reason 2 ..... [1]

(e) Use sketches and notes to show how the end and the side could be joined using KD (knock-down) fittings.

[3]

(f) Use sketches and notes to show how the table top could be supported inside the sides and ends. Your method must allow quick removal.

[3]

[Turn over

(g) Use sketches and notes to show a modification to the play table so that it could be lifted easily.

[3]

(h) The sides of the play table could also be made from 2 mm thick mild steel.

Use sketches and notes to show how one side could be joined to the MDF end.

[5]

12 Fig. 9 shows a pictorial view and a development of a DVD rack made from 1 mm thick sheet metal.

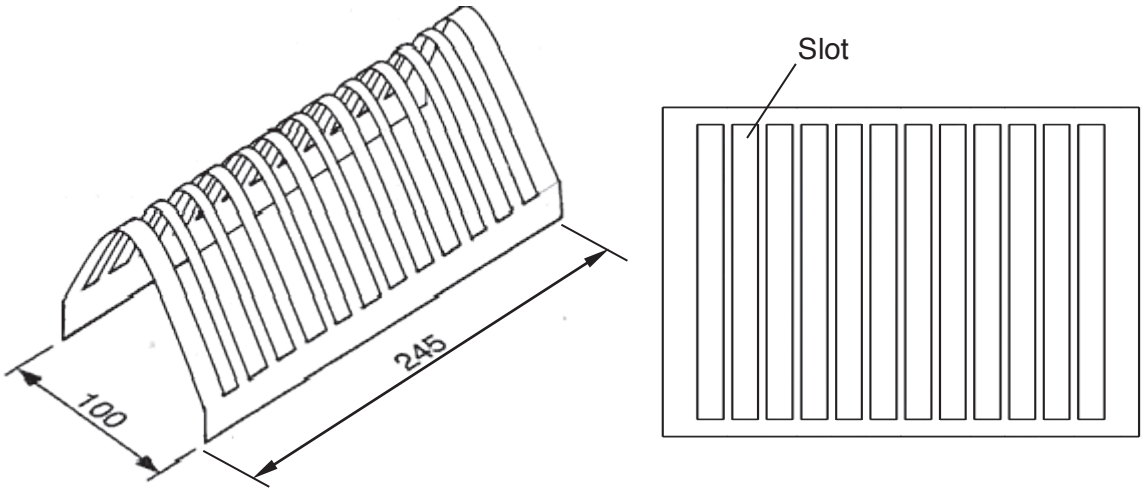


Fig. 9

(a) (i) Name **two** tools used to mark out the slots on the sheet metal shown above.

Tool 1 ..... [1]

Tool 2 ..... [1]

(ii) Use sketches and notes to show how **one** slot could be cut out and the edges made smooth. Name all the tools and equipment used.

[6]

[Turn over

(b) The DVD rack could be made from steel or aluminium.

(i) Name a suitable applied finish for a DVD rack made from steel.

..... [1]

(ii) Describe how you could finish the DVD rack when made from aluminium without applying an additional finish.

.....

.....

.....

..... [3]

(c) Fig. 10 shows a wooden block which will be used to produce a former for bending the metal sheet for the DVD rack.

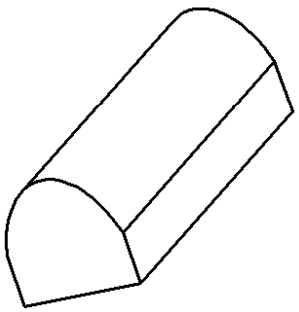


Fig. 10

Use sketches and notes to show how the DVD rack bending former could be:

(i) Marked out;

[2]

(ii) Cut out and made smooth;

[2]

(d) Use sketches and notes to show how the sheet could be bent to shape.

Name the tools and equipment used.

[4]

(e) The DVD rack could also be made from plastic.

(i) Name **two** suitable plastics that could be used to make the rack.

Plastic 1 ..... [1]

Plastic 2 ..... [1]

(ii) Give **two** properties that make plastic a suitable material.

Property 1 ..... [1]

Property 2 ..... [1]

(f) State how the plastic DVD rack could be disposed of at the end of its life.

.....

..... [1]

13 Fig. 11 shows a tray made from 6 mm thick acrylic sheet.

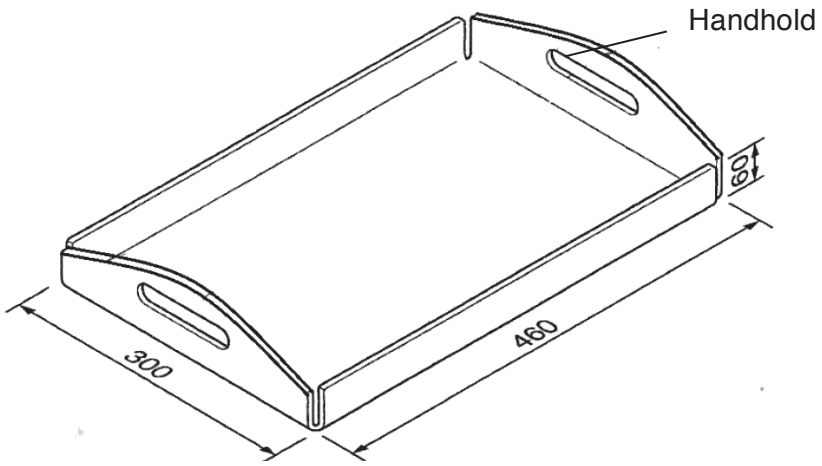


Fig. 11

(a) Give **one** reason for using a marker pen rather than a scriber when marking out lines on acrylic.

..... [1]

(b) Give **two** reasons why there is a gap at each corner of the tray.

1 .....

2 ..... [2]

(c) Complete the table below by naming three stages in finishing the cut edges of the acrylic to a high quality.

Stage	Process
1	
2	
3	

[3]

(d) Fig. 12 shows the acrylic sheet from which the tray will be cut.

Fig. 12

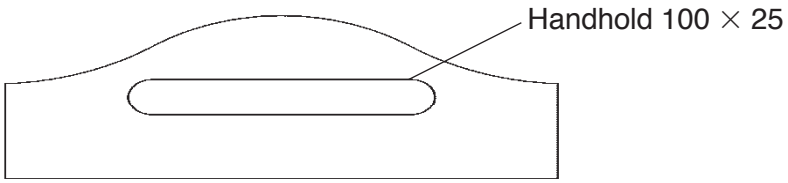
Sketch the development of the tray on Fig. 12.

Indicate those lines that will be bent and those that will be cut.

Do not indicate the cut out handholds but do include the shaped end. [5]

(e) Details of **one** of the handholds are shown below.

Use sketches and notes to show how the handhold could be cut out and edges made smooth.



[4]

(f) **(i)** Name an appropriate joint that could be used to join the members of a wooden tray as shown in Fig. 13.

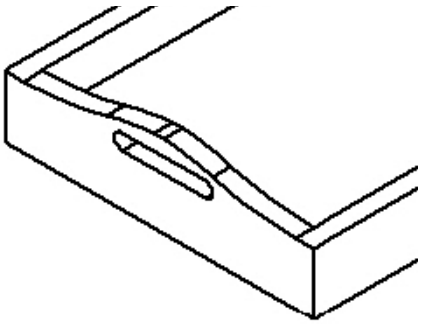


Fig. 13

Name..... [1]

(ii) Use sketches and notes to show exploded views of how a hardboard base can be fitted such that it is not seen on the sides and ends.

[4]

(g) Fig. 14 shows a different design for the tray made from 1.5 mm thick copper sheet.

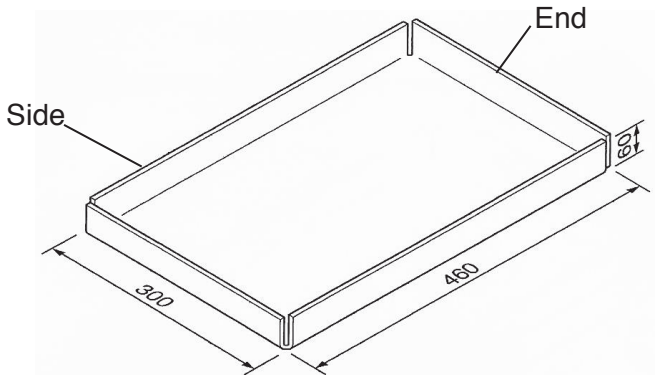


Fig. 14

(i) Use sketches and notes to show how the copper sheet could be shaped to form the tray after it has been marked.

[3]

(ii) Describe **two** processes of finishing the copper tray to achieve and maintain a shiny surface.

.....

.....

.....

..... [2]