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 2022**

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 in the spaces provided at the top of the page.
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 a calculator.
The 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 **15** printed pages and **1** blank page.

[Turn over

Section A

Answer **all** questions in this section.

1 Fig. 1 shows a plastic bucket.

Fig. 1

(a) State a suitable plastic for the manufacture of a plastic bucket.

..... [1]

(b) Give a reason for your choice of plastic.

.....

..... [1]

2 Fig. 2 shows a tool used on a lathe.

Name the tool and give its use.

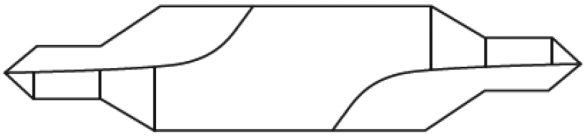

Fig. 2

Name ..... [1]

Use ..... [1]

3 Knock-Down (K-D) fittings are used in flat pack furniture.

Name **one** Knock-Down (K-D) fitting.

..... [1]

4 Fig. 3 shows adhesives and their uses.

Draw a straight line to match the adhesives in Fig. 3 with the most suitable use.

You must match each adhesive to a different use. [5]

Adhesives		Use
	Glue stick	General purpose for paper, card, wood and foam board.
	PVA	Used for masking out areas when airbrushing.
	Epoxy resin	A two-part adhesive. Creates a strong bond between most materials.
	Hot glue	Useful in model making or temporary joints.
	Polymer cement	Joining plastic to plastic.
		Solid glue. Bonds paper to paper.

Fig. 3

5 Describe the health and safety precautions, other than the wearing of personal protection equipment, that you would consider when:

(a) using a chisel in the workshop

.....

..... [1]

(b) facing off length of Ø 20 mm aluminium bar

.....

..... [1]

(c) working with contact adhesive

.....

..... [1]

6 Fig. 4 shows a bridle joint used at the corner of a wooden chair.

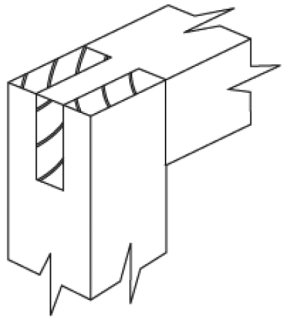

Fig. 4

Name **one** marking out and **one** cutting out tool that could be used to make this joint.

Marking tool ..... [1]

Cutting tool ..... [1]

7 Fig. 5 shows two different saws used in a Design and Technology workshop.

Fig. 5

Explain:

(a) why the blade in saw **A** can be fixed at 90° to its normal cutting position

.....

..... [1]

(b) the purpose of the 'back' on saw **B**

.....

..... [1]

8 Fig. 6 shows a dressing table tool and wood chisel.

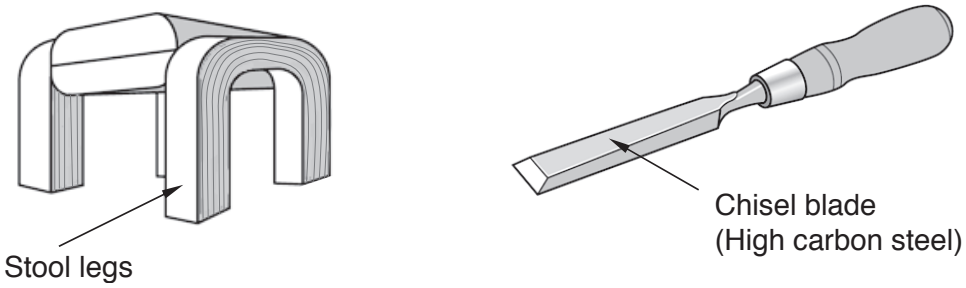

Fig. 6

Describe how the material of the stool legs and the chisel blade has been modified to improve their strength.

Stool legs

.....

.....

..... [2]

Chisel blade

.....

.....

..... [2]

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9 Give **two** reasons why evaluation is important in design.

Reason 1

.....

..... [1]

Reason 2

.....

..... [1]

10 Explain what is meant by the terms *tempering* and *annealing*.

Tempering

.....

..... [1]

Annealing

.....

..... [1]

For Examiner's Use

Section B

Answer **one** question in this section.

11 Fig. 7 shows a design of a child's toy.

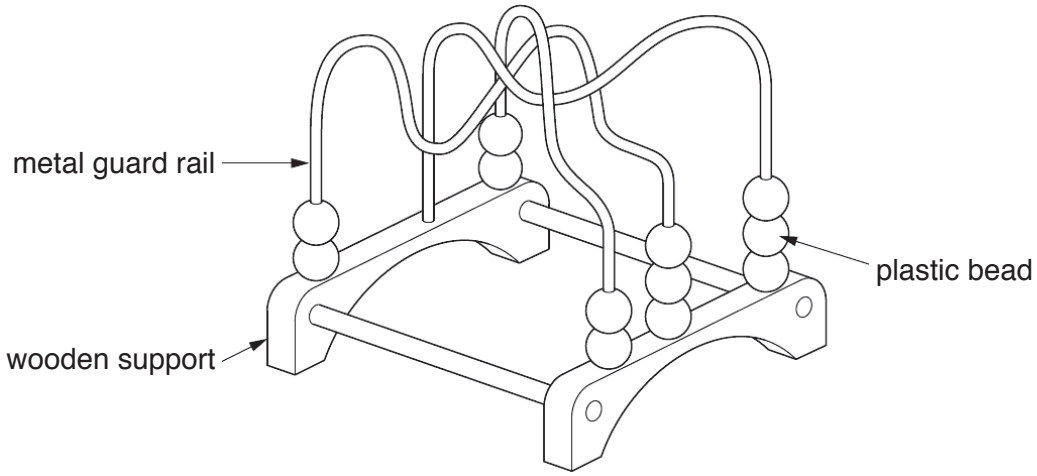

Fig. 7

(a) Suggest a suitable material for making the following parts and give a reason for your choice:

(i) metal guide rail

Material

..... [1]

Reason

.....

..... [1]

(ii) wooden support

Material

..... [1]

Reason

.....

..... [1]

(iii) plastic bead

Material

..... [1]

Reason

.....

..... [1]

(b) Using the materials chosen in **(a),** describe, using notes and sketches how to:

(i) Make the plastic bead.

[4]

(ii) Cut the wooden support.

[4]

(iii) Join the metal guide rail to the wooden support.

[4]

(c) Describe how the metal used to make the guide rail could be annealed if it hardens.

.....

.....

.....

.....

.....

.....

.....

.....

..... [3]

(d) Describe how you would apply paint to the wooden support if it has no knots.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

For Examiner's Use

12 Fig. 8 shows an outline design of a scissor storage rack used in a school Fashion and Fabric studio made of 5 mm thick plastic.

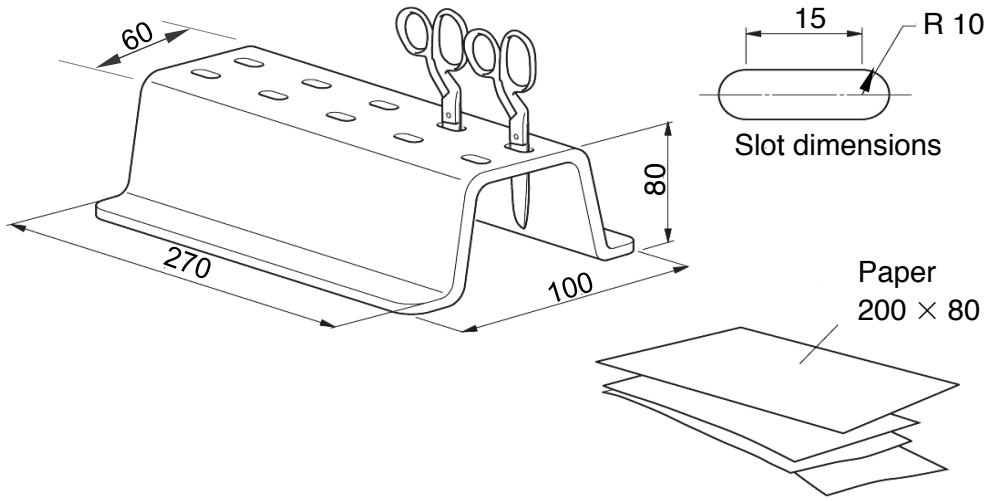

Fig. 8

(a) Suggest a suitable plastic for the scissor rack and state **two** reasons for your choice.

Specific plastic

.....

..... [1]

Reason 1

.....

.....

..... [1]

Reason 2

.....

.....

..... [1]

(b) State what would be used to mark the bend lines on the plastic sheet before bending.

..... [1]

(c) Name a saw that could be used to cut the development (Net) of the scissor storage rack from a sheet of plastic after marking out.

.....

..... [1]

(d) Describe how the edges of the rack could be finished after sawing.

.....

.....

.....

.....

.....

.....

.....

.....

..... [3]

(e) Using notes and sketches show how:

(i) To cut out one slot from a flat sheet of plastic.

[4]

(ii) Bends could be made on the plastic sheet.

[4]

(iii) The rack could be modified to hold sheet of papers shown.

[6]

(f) List **three** tools that you would use to make the straight bend if the rack was made of aluminium.

Tool 1 ..... [1]

Tool 2 ..... [1]

Tool 3 ..... [1]

13 Fig. 9 shows the design of a chair and details of an end-cap.

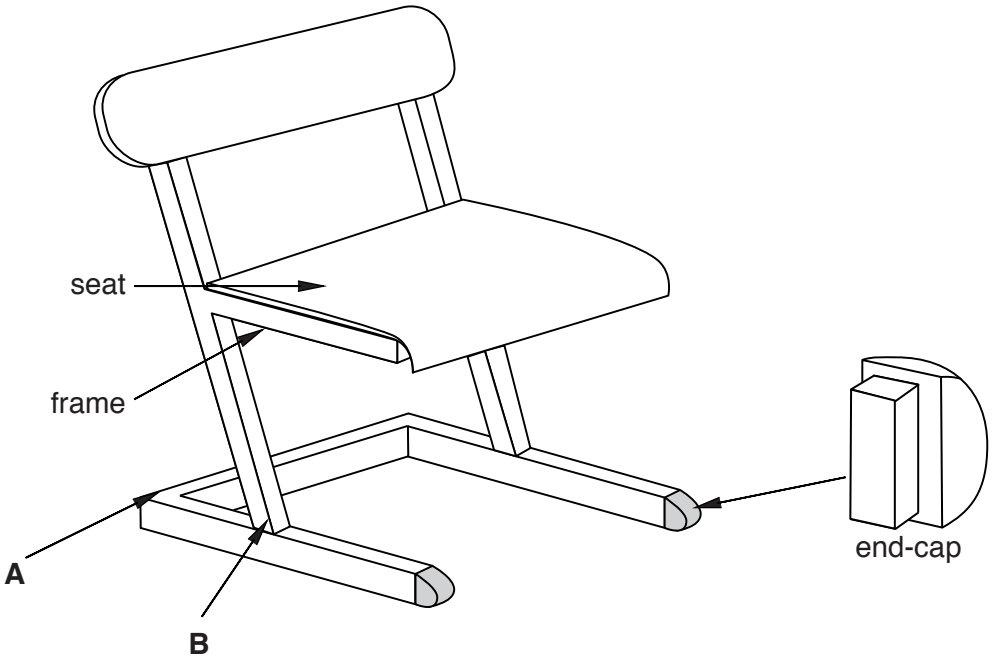

Fig. 9

The frame is made from rectangular section mild steel tube, the seat is laminated birch and the end-cap is made from nylon.

(a) Give **one** advantage of using mild steel tube over a rectangular bar when making the chair frame.

..... [1]

(b) State why nylon is a suitable plastic for the end-cap.

.....

..... [1]

(c) State why birch is suitable for the seat laminate.

.....

..... [1]

(d) Name the tools that could be used to mark the 45° angle at joint **A**

Tool 1 ..... [1]

Tool 2 ..... [1]

[Turn over

(e) Use sketches and notes to describe how:

(i) joint **B** is marked and cut out

[4]

(ii) to make the laminated seat

[4]

(iii) the end-cap is made

[4]

(f) Describe how to square the tube frame before putting the end-cap.

.....

.....

.....

.....

.....

..... [4]

(g) Describe in detail how to paint the steel tube frame of the chair.

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..... [4]

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