Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

WOOD TECHNOLOGY 6027/1

Paper 1 Theory,

SPECIMEN PAPER 3 hours

Additional materials:
- Answer sheet
- Coloured crayons
- Drawing paper (**A2**)
- Metric scale rule, scale of **1:1**and **1:5**
- Standard drawing equipment

TIME 3 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on **all** separate answer paper used.

Section A Theory
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

Section B Graphics and Design
Compulsory question.
Write your answers on the separate A2 drawing answer paper provided.

Section C Calculations
Answer **one** question only use **A2** drawing paper provided.
At the end of the examination, fasten the separate answer paper and drawing paper securely to the question paper.

FOR EXAMINER'S USE	
A	
B5	
C6	
C7	
TOTAL	

INFORMATION FOR CANDIDATES
Marks is given in brackets [ ] at the end of **each** question or **part** question.
You are advised to spend no longer than **30 minutes** on **Section A**, **1 hour 50 minutes** on **Section B** and **40 minutes** on **Section C**.

This question paper consists of 9 printed pages and 3 blank pages.

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SECTION A (20 marks)

Answer **all** questions in this section in the spaces provided.

You are advised to spend **not** more than **20 minutes** on this section.

1 For each of the following materials explain in detail why it is suitable for the product. In your answer consider its mechanical properties and aesthetics.

a)

material	product
formica	Kitchen work surface
mahogany	In-door coffee table

(i) Formica _____

_____

_____

_____

_____

_____ [4]

(ii) Mahogany _____

_____

_____

_____

_____

_____ [4]

b) State **two** advantages of manufactured boards over natural wood.

(i) _____

_____ [1]

(ii) _____

_____ [1]

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2 **a)** Identify any wood waste product.

_____

_____ [1]

b) For the wood waste product identified in **(a)**, explain in detail how you would convert the waste into a useful product.

_____

_____

_____

_____

_____

_____

_____

_____ [6]

c) List the **three** risk management steps that would apply throughout production.

The steps do not need to be in order.

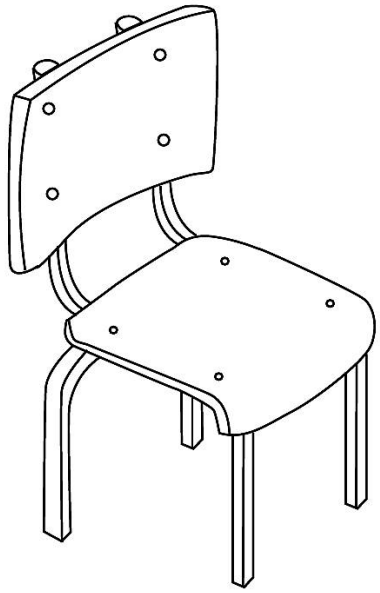
(i) _____

(ii) _____

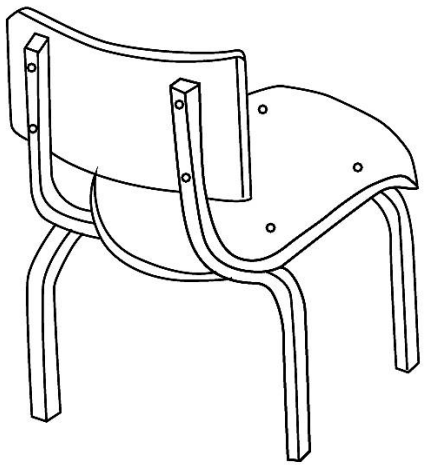
(iii) _____ [3]

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3 Explain how the school chair in **Fig. 1 (a)** and **(b)** below has been designed to be suitable for use in the classroom.



(a)



(b)

Fig. 1

4 **(a)** What is CAD?

_____ [1]

_____

(b) Explain in detail how 3D CAD software has been used to improve each of the following areas of product design:

(i) concept development,

_____

_____

_____

_____ [3]

(ii) communication within the design team and,

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_____

_____

_____

_____ [3]

(iii) Pre-production testing.

_____

_____

_____

_____ [3]

SECTION B

*Answer all questions on **A2** plain paper provided*

*You are advised to spend **not** more than **1 hour 50 minutes** on this section.*

5. A student at a college is wheelchair bound. He wants to use textbooks in the Library from higher shelves. The books have different sizes.

(a) Design an artefact that can help the student to have access to textbooks from higher shelves while on the wheelchair. [8]

(b) State any 3 factors that are important for the design of the artefact. [3]

(c) **(i)** Illustrate a mechanism that would allow the unit to be extended to reach different levels of shelves. [4]

(ii) Sketch a mechanism to bring down the books safely. [4]

d) Choose one component of the unit and show how it is manufactured. [5]

e) Sketch the front elevation and sectional end elevation of the artefact include important dimensions. [10]

f) Draw up a cutting list of the finished sizes of the major components. [4]

g) Name a material to be used on your artefact and justify your answer. [2]

SECTION C

*Answer **one** question only from this section.*

*You are advised to spend **not** more than **40 minutes** on this section.*

6 The drawing in **Fig. 2** below shows a stool made of pine.

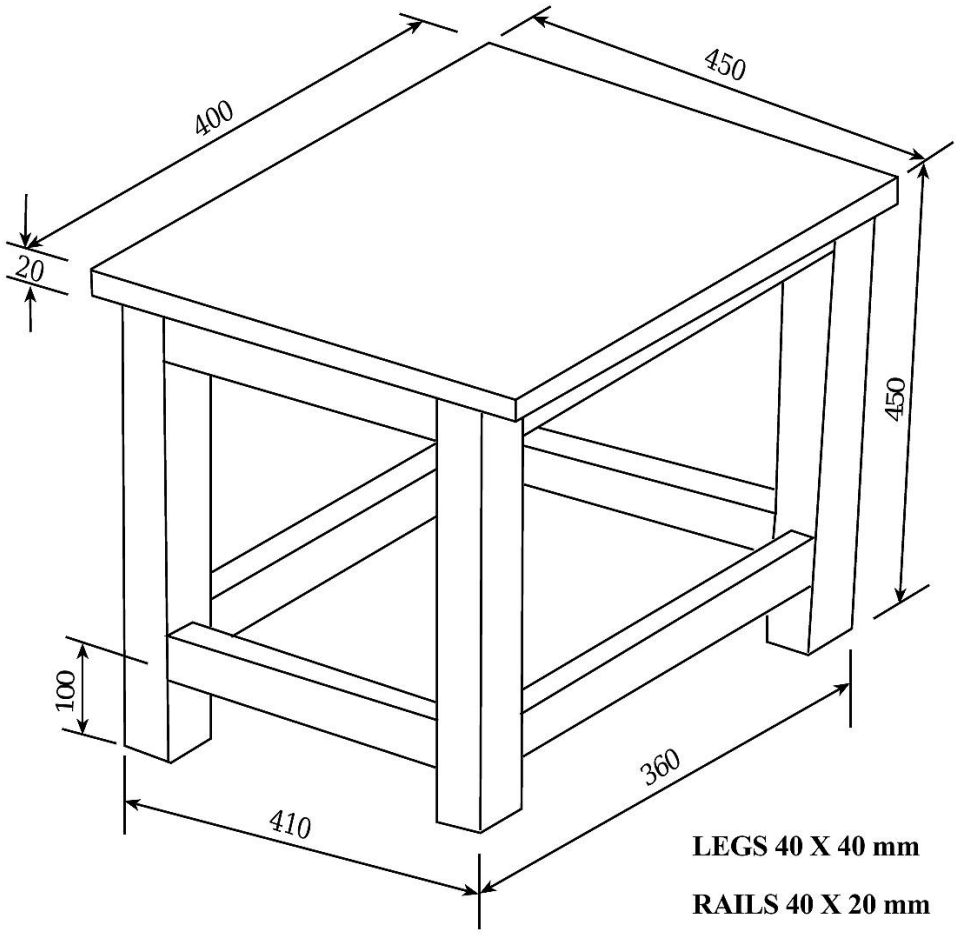


Fig. 2

Prices of materials

Pine $ 294.00/m^3

Blockboard $ 45.00/board (2440 x 1220 x 19mm)

Clear varnish $ 41.60/5 litres

a) Calculate the amount of timber required in **cubic metres** for the stool under frame using rough sawn measurements. [4]

b) Calculate the cost of timber used to produce the underframe including the seat. [4]

c) Calculate the cost of varnish assuming 517 ml of varnish were used. [1]

d) Assuming the labour is calculated at 45% of the total cost of materials including sundries of $5.15, calculate the cost of the stool. [3]

(i) What would be the mechanical advantage if 100 N is needed to lift a load of 400N. [2]

(ii) What is the velocity ratio (VR) of the beam given in **Fig. 3.** [2]

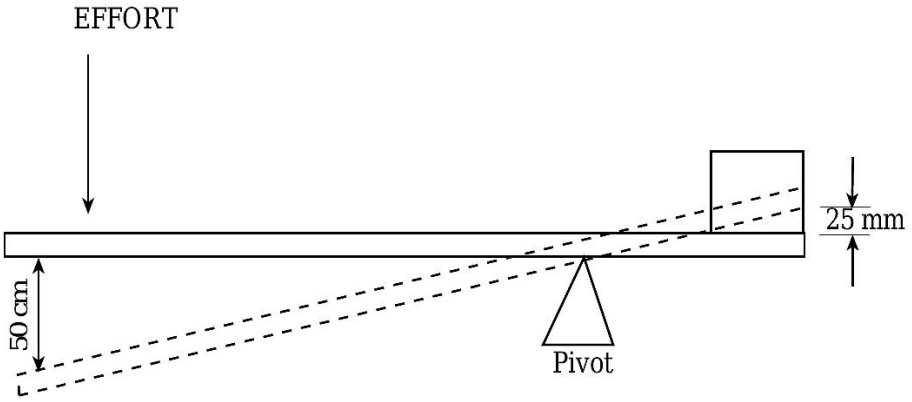


Fig. 3

(iii) A simply supported beam with a point load of 16 kN is illustrated in **Fig. 4** below. Find R_L and R_R supported reactions. [6]

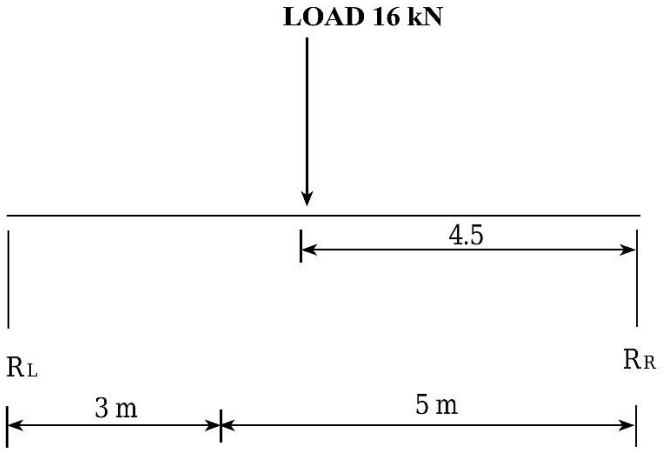


Fig. 4

7 **(a)** Calculate the prices of the following:

(i) 162 handles at $252.00 each, [2]

(ii) 750ml of thinners at $15.50 per litre, [2]

(iii) 16.5g of glue at $11.64 per kg, [2]

(iv) 65 door catches at $25.00 per 100, [2]

(v) 5 litres of turpentine at $ 9.25 per 750ml, [2]

(vi) A house contains forty-eight 50 x225mm softwood joists 4,50m long.

How many cubic metres are required? [2]

(b) **(i)** The horizontal cross-section of a 2.400m high column is shown in **Fig. 5** below differencing volume of concrete would be required to cast it? [5]

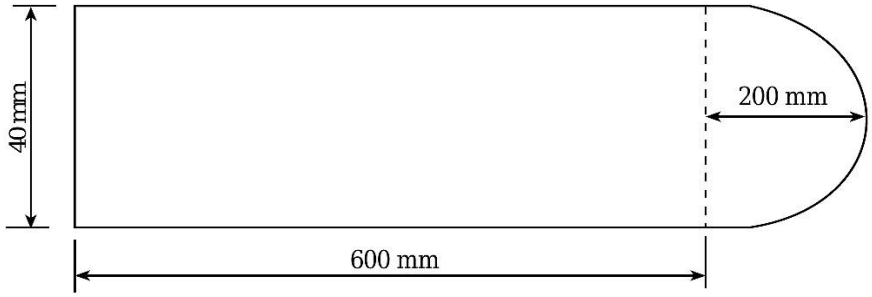


Fig. 5

(ii) The beam shown in **Fig. 6** is in equilibrium

Calculate the reactions at **A** and **B**. [3]

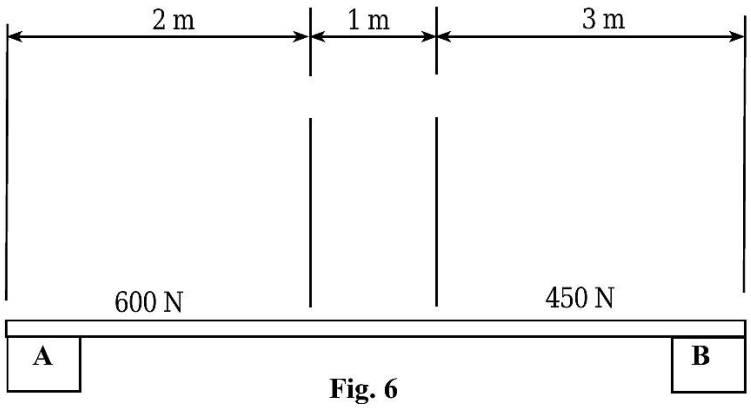


Fig. 6

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