

08/1



CENTRE NUMBER	CANDIDATE NUMBER

MINISTRY OF EDUCATION AND HUMAN RESOURCE DEVELOPMENT

SOLOMON ISLANDS SCHOOL CERTIFICATE

2019

INDUSTRIAL ARTS/DESIGN AND TECHNOLOGY

QUESTION AND ANSWER BOOKLET

THURSDAY 14TH NOVEMBER 9:00 AM

TIME: 3 Hours Plus 10 Minutes
Reading Time.

<u>SECTION</u>	<u>CONTENT</u>	<u>MARKS</u>
A	Multiple Choice Questions	20
B	Short Answer Questions	20
C	Long Answer Questions	30
D	Designing/Evaluation Questions	30
		<u>100</u>

INSTRUCTION TO CANDIDATE

1. Do NOT open this Booklet until you are told to do so.
2. Make sure both your Centre Number and Candidate Number are written in the box provided at the top right hand corner and also on the back-flap at the back of this booklet.
3. This paper consists of FOUR (4) sections. **All sections are compulsory.**
4. Write your answers to **Section A** on the Answer Sheet on the **BACK-FLAP** on the last page. And your answers to **Sections B, C and D** in the spaces provided in this booklet.
5. This paper is worth 30% of the examination marks.
6. Do NOT use correction fluid.
7. Mobile phones are NOT allowed in the Examination room.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

THIS BOOKLET CONTAINS 22 NUMBERED PAGES.

SECTION A:**MULTIPLE CHOICE QUESTIONS****(20 MARKS)****WRITE YOUR ANSWERS ON THE BACK-FLAP AT THE END OF THIS BOOKLET.**

1. When a student enters the workshop for practice, **personal safety** requires him or her to wear proper clothing, having short haircut and to;
 - A. wear slippers.
 - B. wear safety boots.
 - C. run quickly in a workshop.
 - D. strike wooden chisel with mallet.

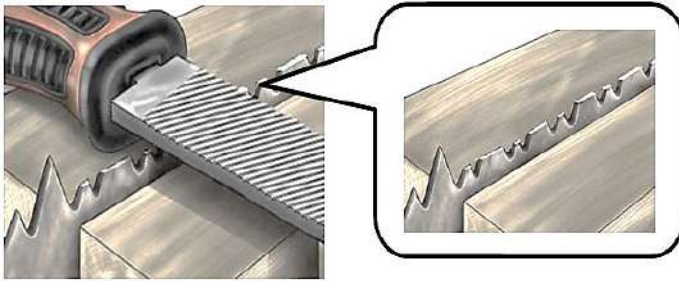
2. Working with timbers that have defects can be very challenging. Identify the **defect** shown below.



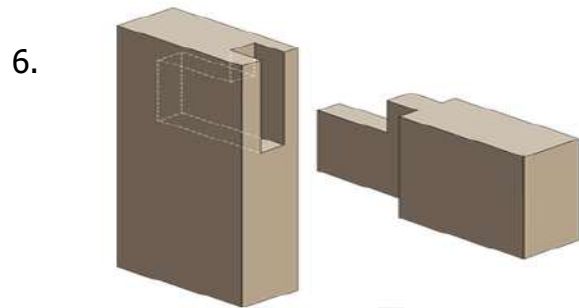
- A. Growth defect.
 - B. Seasoning defect.
 - C. Tree felling defect.
 - D. Transportation defect.

3. An advantage of **manufactured boards** over solid timber is, it;
 - A. is durable.
 - B. has strong grain.
 - C. has more attractive grain.
 - D. can be produced in larger sheets.

4. Hand saw re-conditioning follow several steps. Name the saw repair step shown below.



- A. Topping
 - B. Reshaping
 - C. Saw setting
 - D. Saw honing
5. The wood species used to build **boat hull** in Solomon Islands is;
- A. Kauri.
 - B. Rose wood.
 - C. Vitex (Vasa).
 - D. Taun (Akwa).

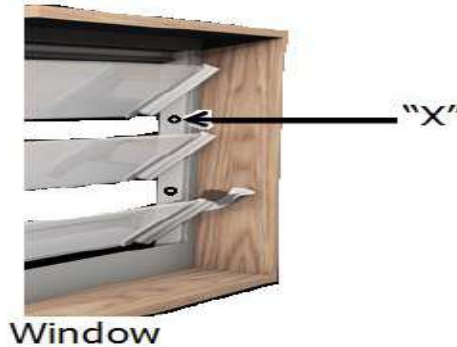


The **joint** shown above belongs to the group identified as _____ joints.

- A. dowel
- B. framing
- C. widening
- D. box and angle

7. Three coats steps in a painting job should be followed to get a satisfactory finished result. The correct order of coating is as follows;
- A. under coat, high gloss and top coat.
 - B. under coat, high gloss and primer coat.
 - C. primer coat, under coat and high gloss.
 - D. high gloss, under coat and primer coat.

8. Study the diagram of a window frame below and identify an appropriate **fastener** for the purpose labeled "X".



- A. Rivet nail.
 - B. Coach screw.
 - C. Jolt head nail.
 - D. Counter sunk screw.
9. Tinplate is commonly used for sheet metal construction in various household articles. What **property** in a tinplate enables different shapes to be formed?
- A. Tenacity.
 - B. Hardness.
 - C. Malleability.
 - D. Fusibility.
10. Solid shank rivet joints cannot be used in sheet metal parts that are not easily accessible. In such condition, it is MORE appropriate to use;
- A. pop riveting.
 - B. bifurcation.
 - C. rivet and rove.
 - D. groove set rivet.

11. An appropriate method to use on baking tray edge to provide **rigidity and safety** is;

- A. folding edge.
- B. wire edging.
- C. straight notching.
- D. groove seaming.

12. What is the use of the **sheet metal percussion** tool shown below?



- A. Stake to square the bottom.
- B. Substitute to metal hammer.
- C. Bending sheet metal to different angles.
- D. Dressing the side of sheet metal article.

13. Aluminum do NOT corrode because it;

- A. is a ferrous metal.
- B. is a non-ferrous metal.
- C. contains iron and alumina.
- D. contains carbon and alumina.

14. Which of the tools below can be used to cut **threads** on bolts?

- A. Bolt maker.
- B. Tap wrench.
- C. Pipe wrench.
- D. Taps & Dies.

15. The part labelled "Y" in the oxy-acetylene gas welding diagram below is called;

- A. regulator.
- B. tension screw.
- C. flashback arrester.
- D. pressure valve meter.



16. The purpose of applying soap foam on the joints when setting up of gas welding apparatus is to ensure that;

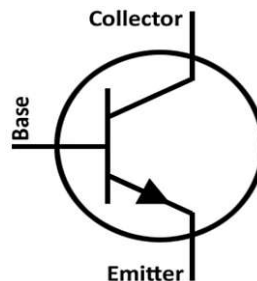
- A. the joints are clean.
- B. gas is not leaking.
- C. joints are lubricated.
- D. oxygen is mixed with acetylene.

17. What is the use of **acetone** in fibre glass construction?

- A. Gel coating.
- B. A cleaning agent.
- C. Hardener for the resin.
- D. Reinforcement for the resin.

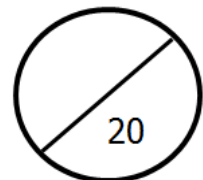
18. The **electronic symbol** shown below represents a;

- A. diode.
- B. resistor.
- C. transistor.
- D. capacitor.



19. The resistor below has yellow (4), Red (2), Orange (3) and Gold (5%).
What is the **value** of the resistor in kilo ohms?
- A. 4.2 K Ω , $\pm 5\%$
 - B. 42 K Ω , $\pm 5\%$
 - C. 4200K Ω , $\pm 5\%$
 - D. 42000K Ω , $\pm 5\%$
20. Ohms' law is the only math needed for basic electronic work. Which of the following formulae would be used to find **current**?
- A. $V = I \times R$
 - B. $P = E \times R$
 - C. $E = \frac{P}{I}$
 - D. $I = V \times R \times P$

Total Marks for section A:



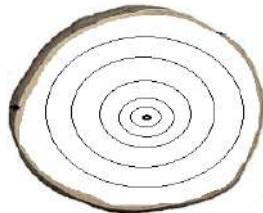
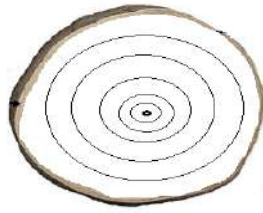
SECTION B: SHORT ANSWER QUESTIONS

(20 MARKS)

WRITE ALL ANSWERS IN THE SPACES PROVIDED.

21. Conversion of timber means the sawing of logs into usable sizes with minimum waste.

i. Sketch TWO (2) methods in the cross-sections provided below.



Method	Sketches (cross-section)
A. Plain or through and through sawing	
B. Quarter or radial sawing	

(2 marks)

ii. From the methods above, explain why **plain sawing board** can easily warp during the seasoning process.

(2 marks)

22. Explain ONE (1) specific **function** for the following wood working tools below:

	Tools (picture)	Specific function
A	Marking gauge 	
B	Sliding bevel 	

(4 marks)

23. Study the flaming torch below and answer questions (A and B) that follow.



Name and state ONE (1) function of 'Y' in the above diagram.

Name: _____ (1 mark)

Function: _____ (1 mark)

A. The flame shown above is an oxidizing flame. Explain how this type of flame is produced.

(2 marks)

24. Seams are joints in sheet metal and they have to be appropriately used on article construction. Sketch the seam that corresponds to the given name and function.

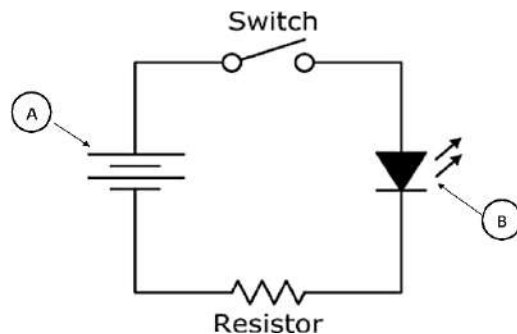
	Seam and function	Sketches
A	Grooved seam -Suitable for water tight vessels	
B	Panned down joint -Appropriately used for circular base of containers	

(4 marks)

25. What does **GRP** stand for?

Answer: _____ (1 mark)

26. Study the **circuit construction** below and answer questions (A and B) that follow.



- A. Explain the **function** of the components shown as:

i. "A":

(1 mark)

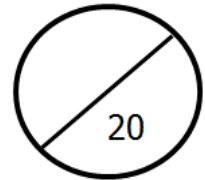
ii. "B":

(1 mark)

B. Name the type of **circuit constructed** (on the previous page).

(1 mark)

Total Marks for section B:



SECTION C: LONG ANSWER QUESTIONS

(30 MARKS)

ATTEMPT ALL QUESTIONS AND WRITE YOUR ANSWERS ON THE SPACES PROVIDED.

27. The GRP handling process.

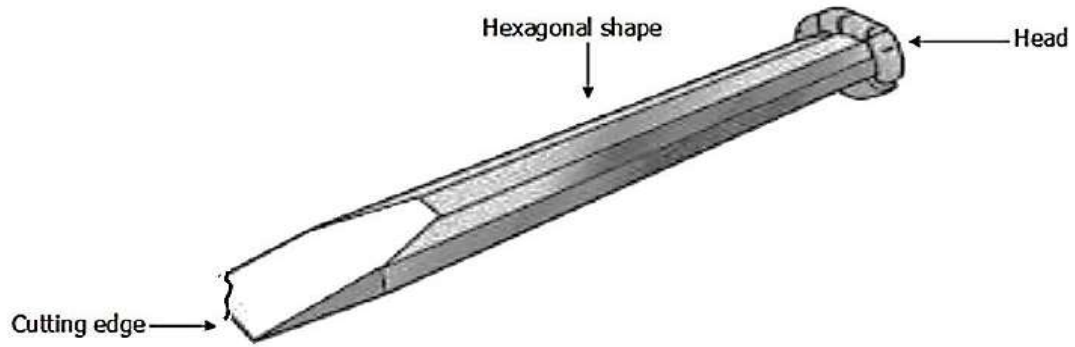
A. Explain with an example the purpose of **gel coat (pigment)** in GRP process.

(2 marks)

B. Describe a situation when wax is NOT properly applied to a mould.

(2 marks)

28. The cold chisel shown below has faults and needs reconditioning in order to be used again.



A. Identify the TWO (2) faults:

- i. _____
- ii. _____

(2 marks)

B. Discuss the TWO (2) steps in the **reconditioning** process.

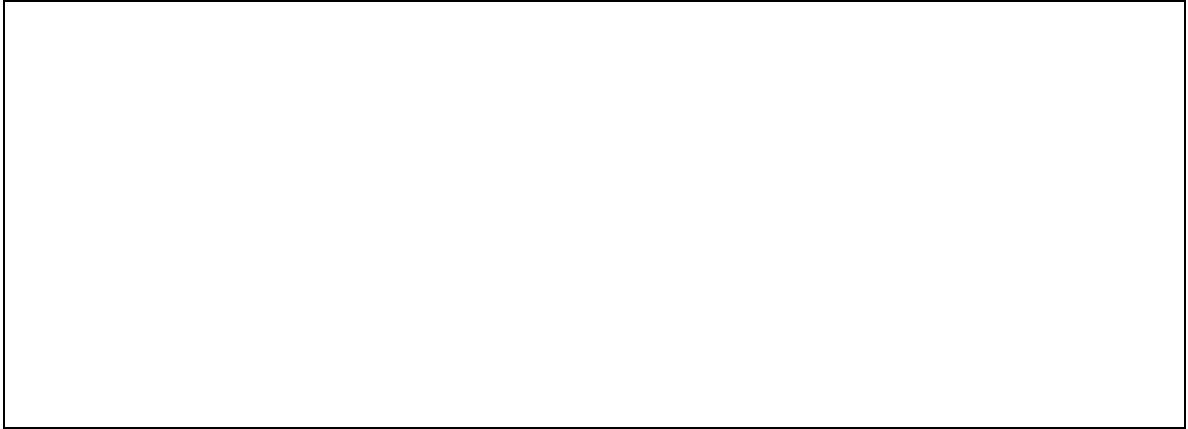
Fault 1:

(3 marks)

Fault 2:

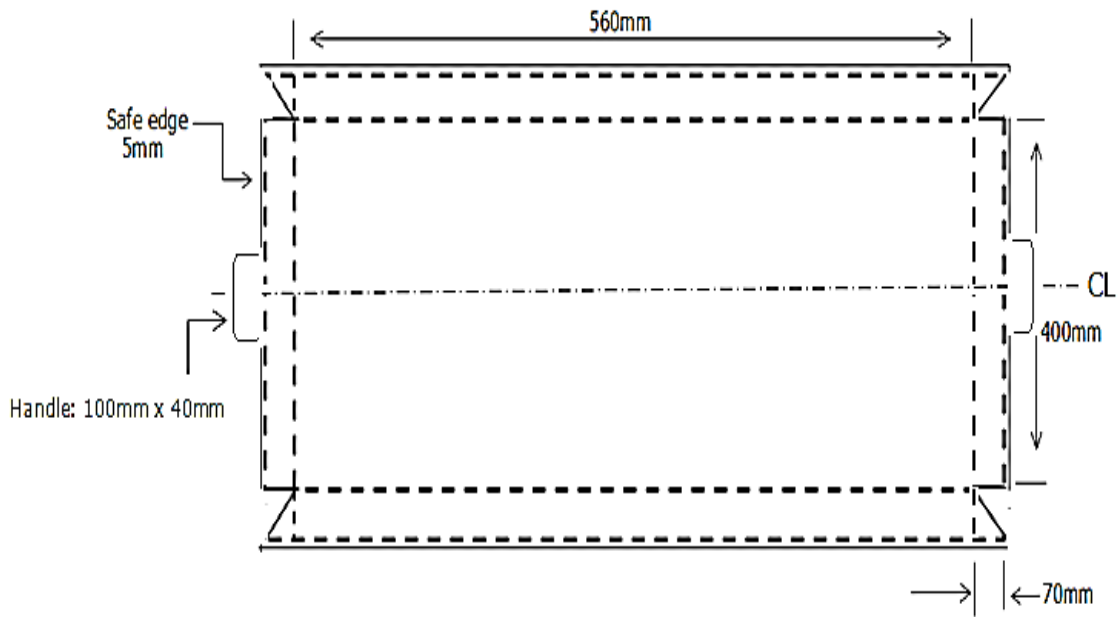
(3 marks)

- C. Sketch the **reconditioned cold chisel** and indicate the improved parts. (*Use your free hand sketch skills*).



(4 marks)

29. Study the **development drawing** of the baking tray below and answer questions (i-iii) that follow.



Construction steps.

- i. Discuss **step one** of the process.

(4 marks)

Tools Used: 1. _____

2. _____ (2 marks)

- ii. Discuss **step two** of the process.

(4 marks)

Tools Used: 1. _____

2. _____ (2 marks)

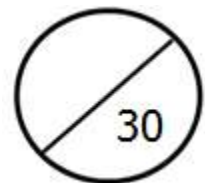
iii. State any TWO (2) skills that you can develop from the metal tray development processes.

1. _____

2. _____

(2 marks)

Total Marks for section



ANSWER EACH QUESTION ON THE SPACES PROVIDED.
-----**WOODWORK: PART A.**30. MATCHING

- i. Match the design steps in column A by writing the corresponding numbers in the spaces provided for its correct definitions in column B.

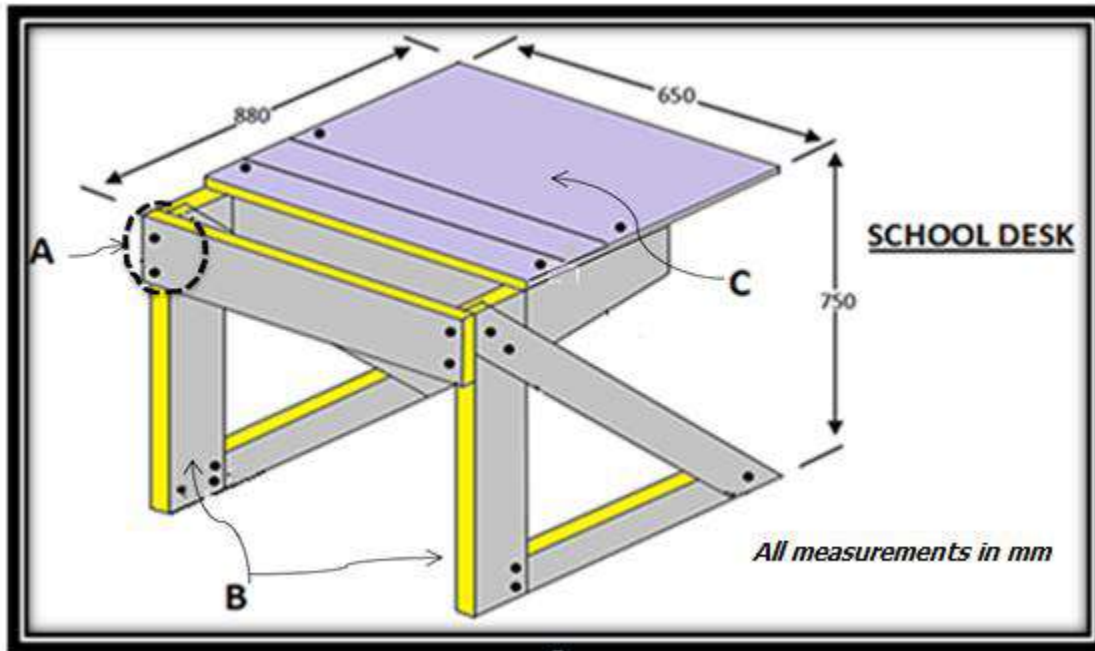
Note: the word list in Column A is more than the definitions in Column B.

	Column A	Column B
1	Evaluation	_____. It is a brief description of what the problem pose.
2	Chosen solution	_____. Field testing for functions.
3	Design consideration	_____. Idea development; focuses on developing elements.
5	Implementation	_____. From these possible solutions, our own ideas sprang from features observed from these solutions.
6	Situation	_____. A project model.
7	Investigation	_____. It involves a sequence of construction which can involve measuring, cutting, joining and finishing.
8	Prototype	
9	Design Brief	

(6 marks)

ii. Design Process application.

Study the situation given below and answer questions 30 (ii) (A – F)



Peter was given a task to investigate a complaint students raised about one of the school desks in the classroom. He took a photo of the desk as shown above and tries to solve the situation.

A. Describe ONE (1) of the **faults** Peter identified.

(2 marks)

B. Make a **Design Brief** statement for the above described situation.

(2 marks)

C. State THREE (3) **design considerations** for your described situation.

i. _____

ii. _____

iii. _____

(3 marks)

D. Sketch any THREE (3) possible solutions for the parts indicated below.
(*Sketch only the parts, NOT the whole desk.*)

Parts	Sketches
Writing space labelled C	
Joint labelled A	
Balance labelled B	

(3 marks)

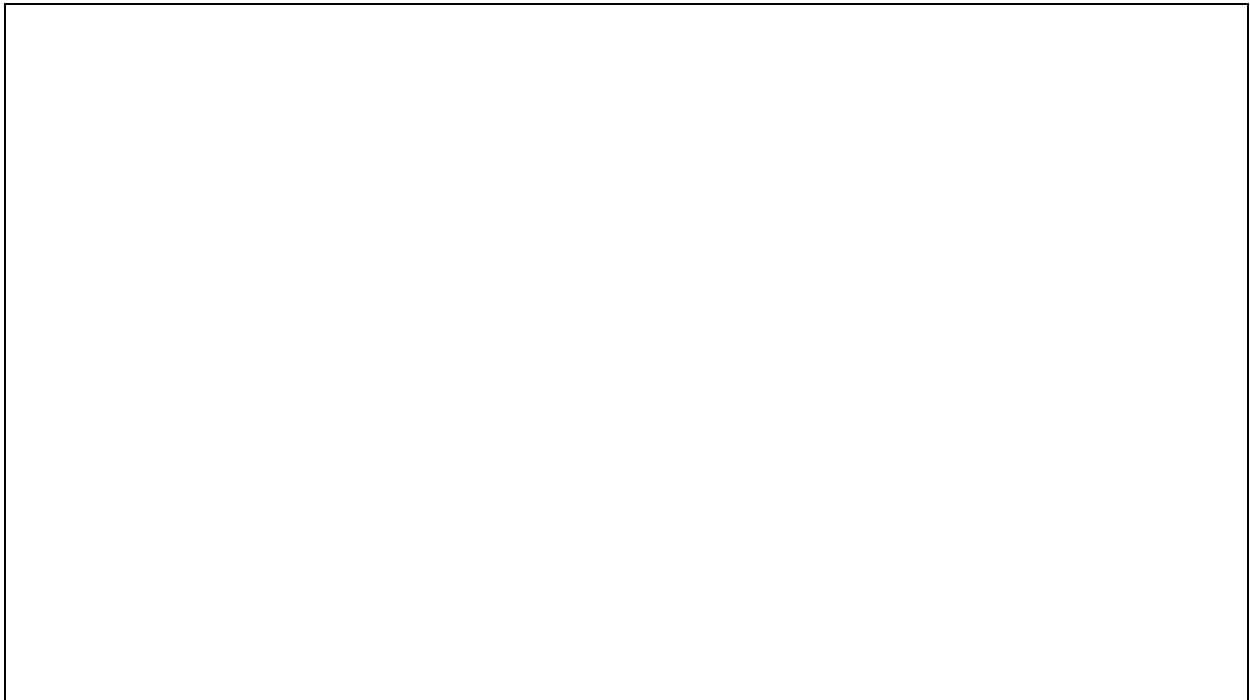
E. Give TWO (2) reasons for selecting **"joint A"**.

a. _____

b. _____

(2 marks)

F. Use your free-hand drawing skills to show the **improved** school desk.



(5 marks)

iii. Explain why a **technological product** changes over time.

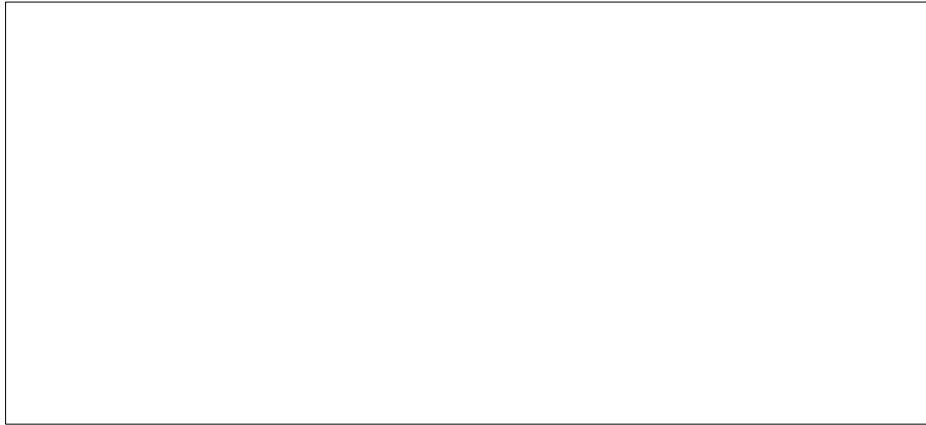
(2 marks)

WOODWORK: PART B

A. The timber order for the **improved school desk** is given below:
(show your working)

- 10 length of 50mm x 30mm x 1m - DAR Akwa
- 4 length of 150mm x 20mm x 1m – DAR Akwa

i. Find the **total volume of timbers (in cubic metres)** ordered for the desk.

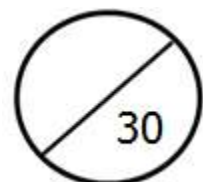


(3 marks)

ii. If the cost for 1 cubic is \$2,400-00. What would be the **total cost** of the order?

(2 marks)

Total marks for section D



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SECTION A MULTIPLE CHOICE (30 MARKS)

Write the letter of the correct answer in the box provided. Make sure your answer is put alongside the right question number.

Example: If you consider A is the correct answer, write it like this: A c

To change your answer from A to C, cross out A and write the new answer by the box, like this: A c

1	<input type="checkbox"/>	11	<input type="checkbox"/>
2	<input type="checkbox"/>	12	<input type="checkbox"/>
3	<input type="checkbox"/>	13	<input type="checkbox"/>
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9	<input type="checkbox"/>	19	<input type="checkbox"/>
10	<input type="checkbox"/>	20	<input type="checkbox"/>

CENTRE NUMBER

CANDIDATE NUMBER

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FOR MARKERS USE ONLY

SECTION	MARKS	MARKER	CHECKER
A	20		
B	20		
C	30		
D	30		
TOTAL	100		
Marker / Checker Initials			