

Candidate Name _____

Centre Number				Candidate Number									

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Design and Technology

6045/2

Paper 2 (Theory & Design)

Additional Information:

Time 2 hours 30 minutes

Instructions to Candidates

Write your name, centre number and candidate number in the spaces at the top of this page and on the separate Answer Booklet provided.

There are **two** sections in this paper.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

If working is needed for any question, it must be shown in the space below that question.

Section B

Answer **any six** questions.

Write your answers in the Answer Booklet provided.

The **first** question is **compulsory** and then answer any other **three**.

All answers should be written in words or sentences and not symbols or formulae unless specified.

Where a diagram is required, it must be drawn to half full size with good lifework.

At the end of the examination:

- 1 fasten the Answer Booklet used securely to the question paper,
- 2 enter the numbers of the Section B questions you have answered in the grid under the bottom right side corner, "For **candidate use**"

Information for candidates

The number of marks is given in brackets [] at the end of each question or part of question.

All dimensions are in millimetres.

Cell phones are not allowed in the examination room.

For Candidate use	For Examiner's use
Section A	
Section B	
Total	

Section A [30 marks]

Answer all the question in the spaces provided on the question paper.

- 1 (a) Figure 1 shows **two** types of joints a Grade 9 pupil made on two of his artifacts.

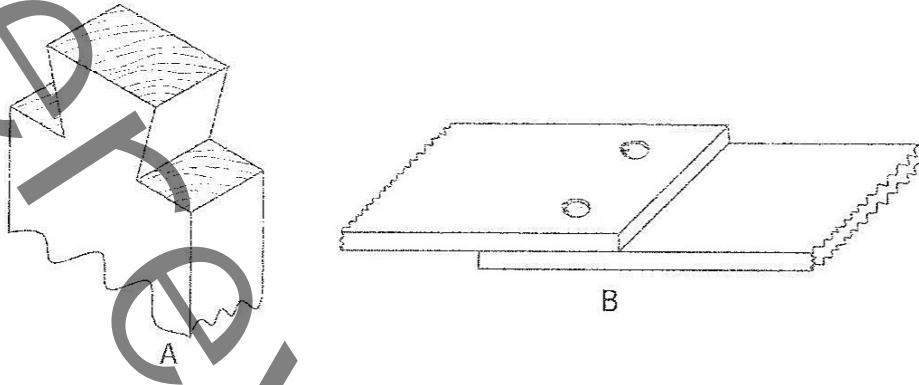


Figure 1

- (i) What tools (one on each) did he use?
- A** [1]
- B** [1]
- (ii) State where these joints can be applied (one on each).
- A** [1]
- B** [1]
- (iii) State the safety precaution you would consider when using the tools used for making joints **A** and **B**.
- A** [1]
- B** [1]

- (b) What would be the suitable material for making the tag in **figure 2**.

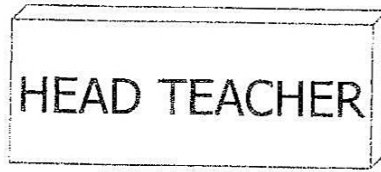


Figure 2

- (i) [1]
- (ii) State **two** reasons for your choice
- (a) [1]
- (b) [1]
- (iii) Write **three** factors you need to take into consideration when buying screws.
- (a) [1]
- (b) [1]
- (c) [1]

Total 12 marks

- 2 **Figure 3** shows different symbols used in electrical and electronics drawings.

- (a) State the function of each as used in the circuits.

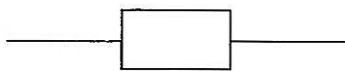
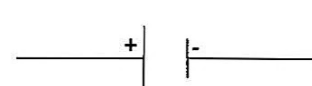
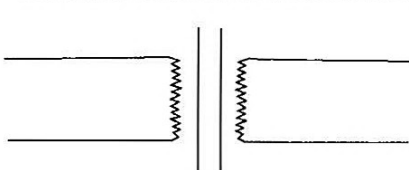
- (i)  [1]
- (ii)  [1]
- (iii)  [1]

Figure 3

- (b) Your classmate has been electrocuted in the workshop as you are working. What would be your first reaction?

.....
 [1]

- (c) (i) When bulbs are connected in series , the last bulb (s) will usually be dim. Give one reason for this

.....
 [1]

- (ii) What would you propose to be the solution to the dimming of the bulbs in (i).

.....
 [1]

Total 6 marks

- 3 One of the factors to consider when designing an artifact is how materials would be joined. The table below shows some joining situations.

- (a) Complete the table by adding the missing information

Joining situation	Joining medium to be used	Reasons for use
Veneer to block board		
Butt		
Tin plate to tin plate		
Brass to pine		

[Total: 12 marks]

Section B [70 marks]

Question 6 is compulsory. Answer any 3 other questions.

6 Study the figure below and refer to it as you answer the questions that follow:

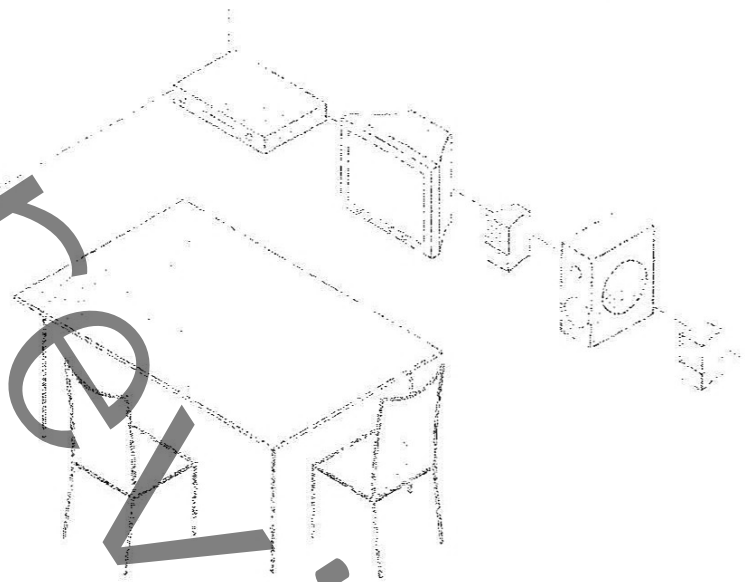


Figure 4

The situation in figure 4 is obtaining in your TV room at home.

- (a) (i) In your own words, write down the situation above. [1]
- (ii) What is the problem in the above situation? [1]
- (b) (i) Define design brief. [2]
- (ii) Write down the design brief leading to your solution. [2]
- (iii) Using annotated sketches, draw **one** possible solution for the situation above. [10]
- (c) One of the important factors to consider in the design of the suggested solution is the material(s).
- (i) List any **four** other specifications you have to consider when coming up with a design solution. [4]
- (d) (i) Suggest **one** suitable material for your solution. [1]
- (ii) Give **two** reasons for:
- accepting the material in **d (i)** [2]
 - rejecting the material in **d (i)** [2]

Total 25 marks

7 **Figure 5** shows a circuit with resistors as shown.

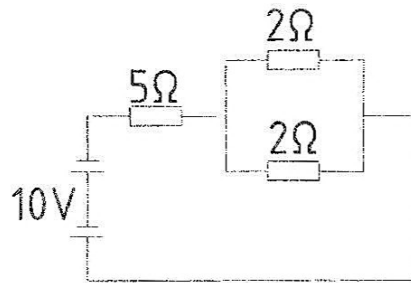


Figure 5

- (a) Calculate the resistance of the two resistors connected in parallel. [4]
- (b) Calculate the total resistance in the circuit assuming that there is no internal resistance in the voltage source. [4]
- (c) What is the total current in the circuit? [3]
- (d) What is the advantage of connecting load resistance in parallel? [1]
- (e) If your television set stopped working , what is the first thing you would check? [1]
- (f) When welding artefacts like door frames, what two safety precautions would you observe? [2]

Total 15 marks

- 8
- (a) Give **three** reasons why timber should be seasoned before use. [3]
 - (b)
 - (i) List **two** appropriate finishes for railed steel if it is to be used outdoors. [2]
 - (ii) Make a sketch and name the tool you would use to mark on railed steel. [4]
 - (c) Make a neat sketch of a try square and state one use. [5]
 - (d) What safety precaution would you observe when cutting plastic on a circular saw. [1]

Total 15 marks

9 **Figure 6** shows a food container made from expanded polystyrene.

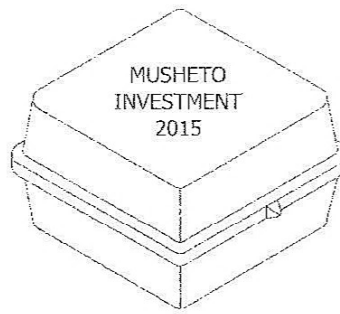


Figure 6

- (a) (i) Suggest **two** reasons why expanded polystyrene has been used to make this product. [2]
- (ii) Name two other items made out of expanded polystyrene. [2]
- (b) List **two** advantages that thermoplastics have over thermosetting plastics. [2]
- (c) Classify the following types of plastics according to their groups. [5]
- Polyester resin, acrylic, urea formaldehyde, rigid polystyrene, epoxy resin.
- (d) Mention **two** methods of joining plastic to metal. [2]
- (e) What are the two safety measures one needs to take into consideration when working with hot plastic? [2]

Total 15 marks

10 You have just been employed as a foreman of a construction company.

- (a) (i) What do you understand by the term aggregate. [1]
- (ii) What constitutes the aggregate for a slab? [3]
- (iii) Working with cement can be hazardous. Give **one** safety precaution you would take when working with cement. [1]
- (b) A poor approach to safety can cause problems in the workshops.
Figure 7 shows some of the tools commonly used in the school workshops.

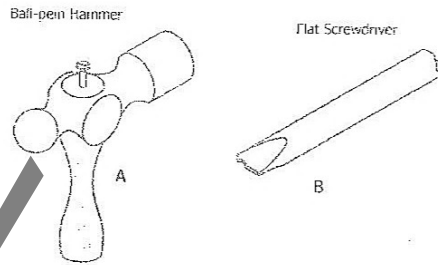


Figure 7

- (i) Identify **one** problem in each of the situations above. [2]
- (ii) Explain how each of the problems in (i) could be dangerous. [2]
- (iii) With the aid of annotated sketches, explain how each of these dangers could be solved in order to make the tools safe.. [6]

Total 15 marks

11 (a) As an entrepreneur, you decide to start up an enterprise.

- (i) What is an enterprise? [2]
- (ii) List **two** skills of a good entrepreneur. [2]
- (b) You have formed the enterprise. Give the name of your enterprise. [1]
- (c) (i) Design the logo for you enterprise. [2]
- (ii) What material would you used for your logo? [1]
- (iii) Give **two** reasons for the choice for your material. [2]
- (d) You are the managing director of your enterprise and you have four workers, two directly under your supervision and two under one of your subordinates.
- (i) Draw up an organisational chart to suit the illustration above. [5]

Total 15 marks