



EXAMINATIONS COUNCIL OF ZAMBIA

JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) – 2016

Design and Technology 608/2

Paper 2

(INTERNAL AND EXTERNAL CANDIDATES)

TIME: 2 hours 30 Minutes

MARKS: 100

Instructions to candidates

- 1 Pull out the **Answer Booklet** from the question paper.
- 2 Write your Name, Examination Number, School/Centre name and Code at the top of the first page on the Answer Booklet.
- 3 There are **three (3)** sections in this question paper, Section A, B and C.
- 4 Answer all questions from Section A and Section B, and choose any **two (2)** questions from Section C.
- 5 In sections A, B and C answer all questions on the Answer Booklet provided.
- 6 In Section A answer all questions on the answer sheet provided. Choose the best answer from A, B, C or D. Mark the letter of the answer that you have chosen with a cross (X)
- 7 In Section B, write your answers in the spaces provided in the Answer Booklet provided.
- 8 In Section C, write all your answers on the blank pages provided at the end of the Answer Booklet.

Information candidates

Cell phones are not allowed in the examination room.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

Section A

Multiple choice questions

Answer all questions from this section. Write all your answers in the Answer Booklet provided. Cross out the best answer from the four (4) choices that are given A, B, C, and D with the letter X.

- 1 The other name for a Die holder is Die ...
 - A Blade.
 - B Handle
 - C Stem.
 - D Hand.
- 2 In Zambian distribution system of electricity, the neutral wire is represented by ...
 - A black.
 - B blue.
 - C red.
 - D yellow.
- 3 When steel is coated with zinc to prevent rusting, it is said to have been ...
 - A alloyed.
 - B galvanised.
 - C soldered.
 - D tempered.
- 4 The drawing in **figure 1** is an electrical fitting.

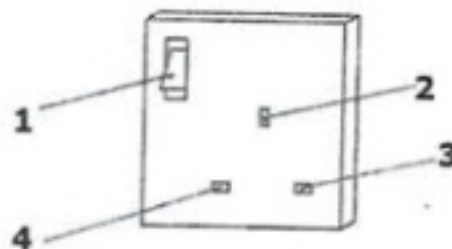


Figure 1

Which part represents the live hole?

- A 1
- B 2
- C 3
- D 4

5 From the colours listed below, identify primary colours.

- A Green, Yellow and Orange.
- B Orange, Red and Blue.
- C Red, Yellow and Blue.
- D White, Yellow and Violet.

6 What is the use of the tool shown in **figure 2**? To ...



Figure 2

- A cut metals.
- B cut plastics.
- C open tins.
- D tighten screws.

7 The drawing shown in **figure 3** is a fitting in the house, Name the drawing.

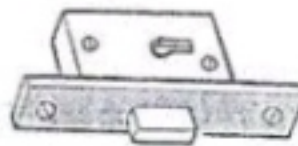


Figure 3

- A Hinge
- B Latch
- C Mortice lock
- D Pad lock

8 **Figure 4** shows one of the measuring tools used by Design and Technology learners. Why is it necessary to start measuring from 0?

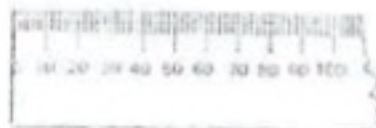


Figure 4

- A Because the designer made it so.
- B Because zero is an odd number.
- C In order for measurements to be in millimetres.
- D To enable measurements to be taken accurately.

- 9 Why do we reduce moisture in timber? To ...
- A improve its appearance.
 - B make it hard.
 - C make it soft.
 - D make it suitable to work with.
- 10 The term used to refer to a material which can be easily be beaten or hammered into shape without breaking is ...
- A brittle.
 - B ductile.
 - C malleable.
 - D tough.
- 11 In the study of electricity, the path followed by the flow of electrons is called ...
- A charge.
 - B circuit.
 - C current.
 - D voltage.
- 12 Curing of bricks is known as the process of ...
- A drying bricks.
 - B giving medicine to the bricks.
 - C stacking bricks.
 - D storing bricks.
- 13 Storage area of plastics should be ...
- A damp and hot.
 - B dust free and non-greasy.
 - C exposed to sunlight.
 - D filled with water.
- 14 What is the main use of the tool in **figure 5**?



Figure 5

- A Preparing a work piece for marking out.
 B For heavy chiselling and cutting mortices.
 C For planing rough surfaces of sawn timber.
 D For straight cutting across thick boards.
- 15 A bench hook is used for holding wood while ...
 A chiselling.
 B planing.
 C schooling.
 D sawing.
- 16 What is the purpose of draw filing? To ...
 A give a curved surface to the work piece.
 B prepare the work piece for drilling.
 C remove burrs from the work piece.
 D remove file marks and produce a smooth finish.
- 17 The drawing in **figure 6** shows a piece of material being cut. Which one of the following shows the best way of cutting the marked piece?

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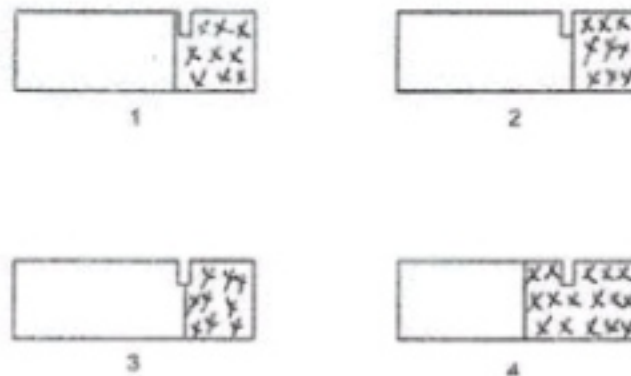


Figure 6

- A 1
 B 2
 C 3
 D 4
- 18 Which adhesive is most suitable for joining two pieces of acrylic?
 A Epoxy adhesive
 B paper glue
 C PVA glue
 D Tensol cement

- 19 The sign (Head Teacher) in **figure 7** is made out of plastic. Which one of the following plastics is most suitable?

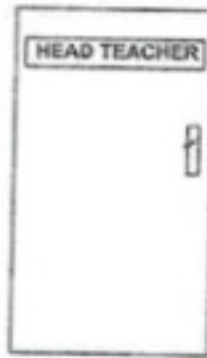


Figure 7

- A Acrylic
B Nylon
C Polythene
D Polyvinyl chloride
- 20 The following are the uses of an Odd-Leg Caliper. Which one is not the correct use?
A Find centre of a bar.
B Mark lines parallel to a true edge.
C Mark outside diameter of tube.
D Trace a true edge.
- 21 Which one of the following is NOT a characteristic of an Entrepreneur?
A Looks for opportunities.
B Reports to the manager early.
C Seeks information.
D Takes the initiative.
- 22 In mechanics the main function of Pulleys is to ...
A drive the machine forward.
B hold the machine upright.
C reduce friction in machines.
D transmit motion in machines.
- 23 Which of the following materials is a good conductor of electricity?
A Aluminium
B Ceramic
C Fibre glass
D Rubber

- 24 Which one of the following statements about safety is correct? Most accidents in the workshop are caused by...
- A learners.
 - B not following rules.
 - C rules.
 - D teachers.

- 25 Which one of the following Mallets is used for shaping internal curves in sheet metals?

- A Blocking Mallet
- B Bossing Mallet
- C Raw hide Mallet
- D Tinman's Mallet

- 26 The diagram in **figure 8** shows some circuit signs. Which one represents a capacitor?

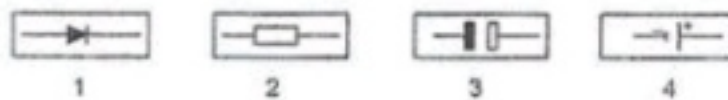


Figure 8

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- A 1
 - B 2
 - C 3
 - D 4
- 27 When carrying out an evaluation of the artefact, one should always refer to the ...
- A possible solutions.
 - B production plan.
 - C research.
 - D specifications.
- 28 Which of the following is the correct order of making a shape from any material?
- A Cut, Measure, Mark, Sand.
 - B Mark, Measure, Cut, Sand.
 - C Measure, Mark, Cut, Sand.
 - D Sand, Cut, Measure, Mark.

- 29 Figure 9 shows materials under different forces. Which of the following represents a material under tension only?

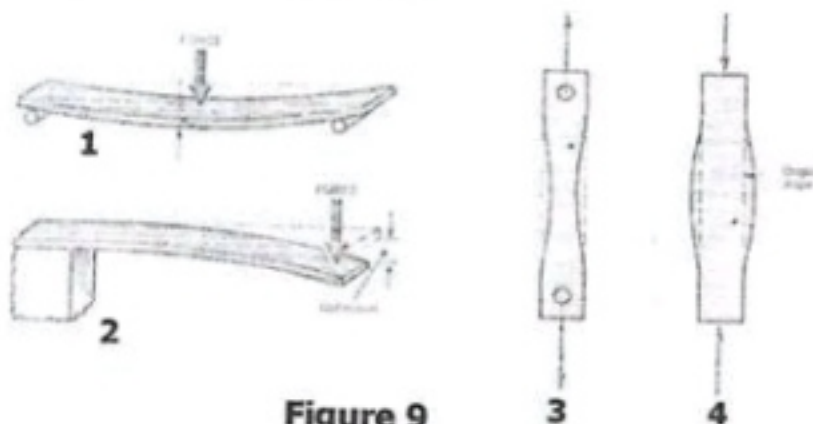


Figure 9

- A 1
B 2
C 3
D 4
- 30 Figure 10 shows a teaching aid in isometric projection.

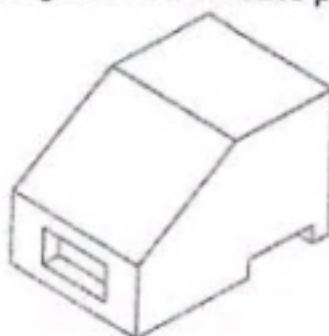
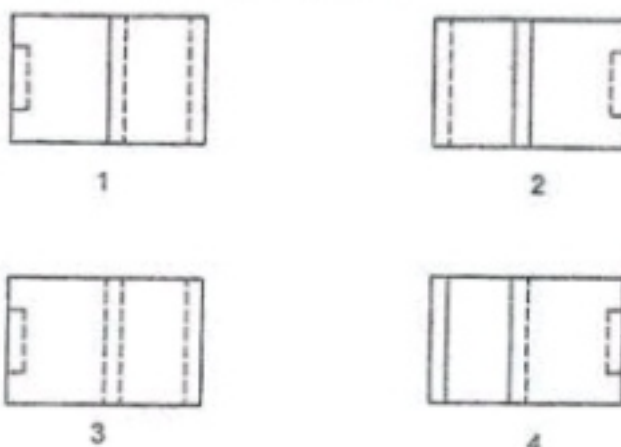


Figure 10

Which of the following is the correct plan?



- A 1
B 2
C 3
D 4

[Total 30 marks]

Section B

Attempt all questions

Write your answers in the spaces provided in the **Answer Booklet**.

- 31 (a)** The diagram below shows one of the tools used in Design and Technology work room.



Figure 11

- (i) Name the tool [1]
- (ii) To which class of tools does the tool above belong?
..... [1]
- (iii) The other name for a cross-pein hammer is
..... [1]

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- (b)** The diagram in **figure 12** shows a marking out tool used in the Design and Technology workshop.

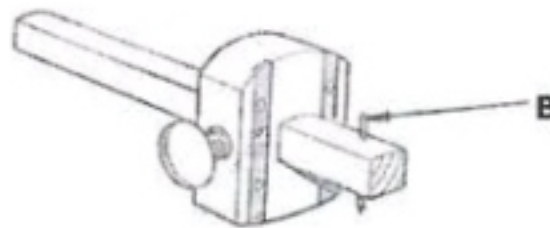


Figure 12

- (i) Name the tool [1]
- (ii) From which material is part **B** made of?
..... [1]
- (iii) What is the use of the tool in the figure above?
..... [1]
- (iv) Explain the use of a mitre square.
..... [1]

- (c) **Figure 13** below shows how Pulleys change or control direction of movement.

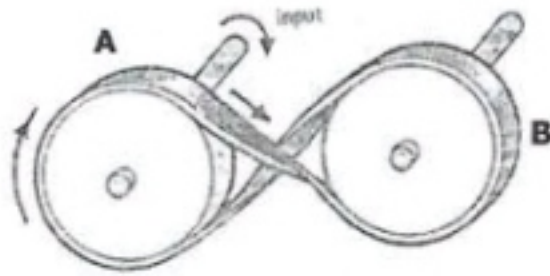


Figure 13

- (i) In which direction will wheel B rotate?
..... [1]
- (d) Give two examples of Shell Structure.
- (i) [1]
- (ii) [1]
- (e) Give two examples of Frame Structure
- (i) [1]
- (ii) [1]
- (f) For each of the following, write the materials from which they are made.
- (i) Car bodies..... [1]
- (ii) Sinks [1]
- (iii) Twist drill bits..... [1]
- (g) **Figure 14** shows a Simple Block in Isometric Pictorial View.

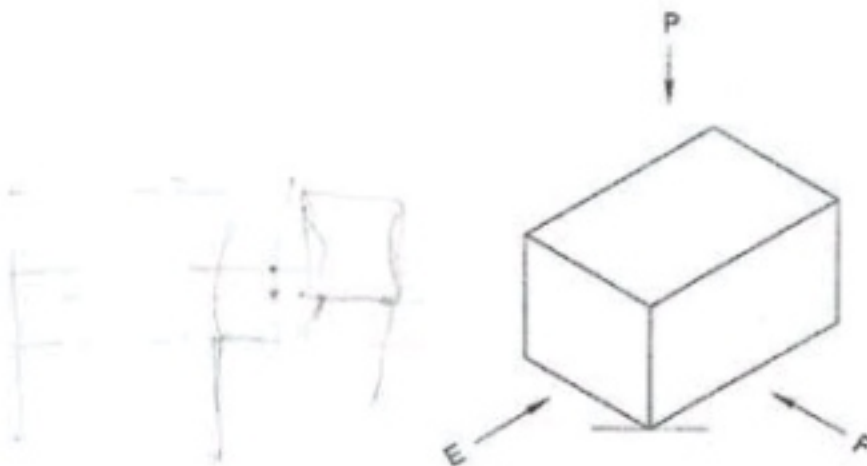


Figure 14

If you were to draw the same solid in orthographic, what dimensions would you use to draw the End View.

(i) [1]

(ii) [1]

(h) The drawing in **figure 15** below shows an electric circuit in symbols.

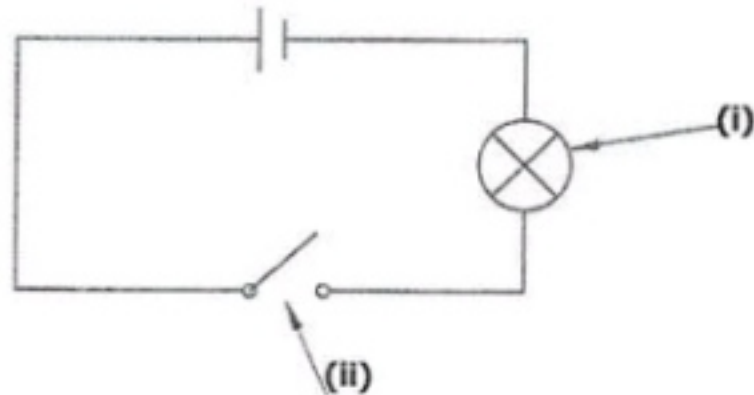


Figure 15

What do the symbols of the labelled parts stand for?

(i) [1]

(ii) [1]

(i) As a group in your class, you have to make the plan of sale of the items as shown in **figure 16**. Complete the plan.

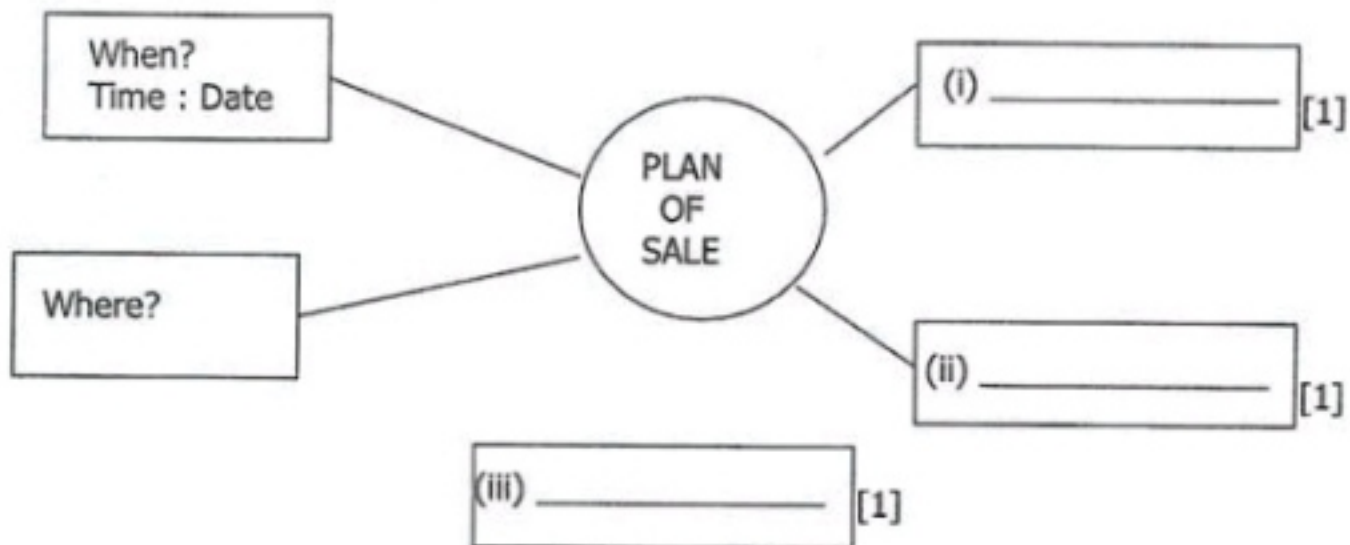


Figure 16

- (j) There are many tools and equipment used in Design and Technology.
Figure 17 shows one of them.

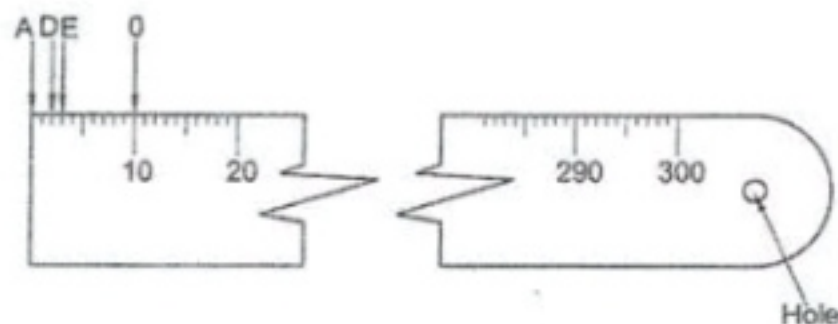


Figure 17

- (i) Classify the tool [1]
- (ii) Record any three uses of the tool.
- (a) [1]
- (b) [1]
- (c) [1]
- (iii) What is the purpose of the hole? [1]
- (iv) Write one safety rule to observe when the tool is in use.
 [1]
- (v) If AO represents 1km, what does ED represent in metres?
 [1]
- (k) Mary has hurt herself and she is bleeding. You decide to clean and cover her wound. What is it that you have done?
 [1]

Section C

Answer question 32 as a compulsory question and any other one from questions 33, 34 and 35. All questions in this section will be answered on the blank pages provided at the end of the Answer Booklet.

- 32 The following situation is obtaining at home in the bathroom. Toothpaste and Toothbrushes are lying all over the Sink.

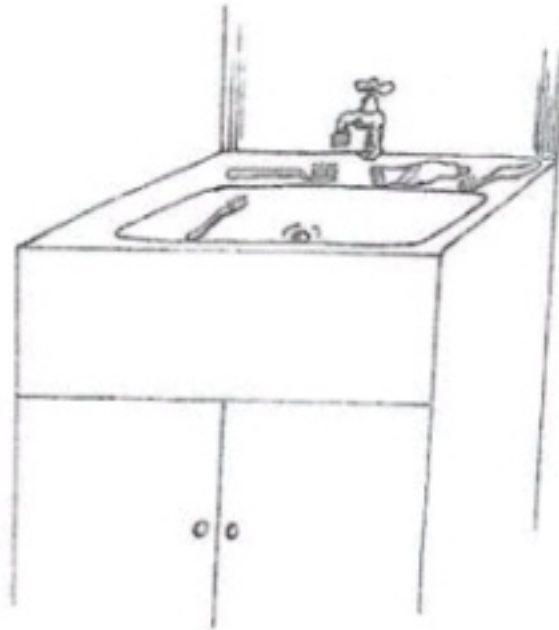


Figure 18

- (a) (i) Suggest a problem from the given situation. [2]
- (ii) From the problem suggested in (a) (i) above, write a Design Brief. [3]
-
- (b) One of the specifications to the possible solution is construction method to be used should be strong.
- (i) Write any other **two** specifications to be considered. [4]
-
- (ii) Sketch freehand a possible solution in isometric projection. You may consider the following: Interpretation, Proportion, Rendering, Neatness and Quality. [5]
- (c) When making the artefacts you will need to use a variety of tools. The table below shows the types of tools. Fill in two (2) of each type in the spaces provided. [6]

Measuring	Marking out	Cutting
(i) _____	(i) _____	(i) _____
(ii) _____	(ii) _____	(ii) _____

- 33 (a) (i) Sketch an isometric Pictorial drawing of either a File or any Saw used in Design and Technology. [6]
- (ii) Label any **three (3)** parts of the tool you have drawn in (a)(i). [3]
- (iii) What is the use of the tool you have drawn? [3]
- (b) (i) Explain **two (2)** ways of how you can care for the tool. [4]
- (ii) Give **two (2)** safety precautions to be observed when using the tool you have drawn in (a)(i). [4]

- 34 (a) From the list of tools given below, classify them according to their appropriate use in Bricklaying. Write at least one tool in each group. Steel Square, Straight edge, Brick Hammer, Hand Hawk, Wire Brush

Laying	Wall Straightening	Cutting and Trimming
(i) _____	(ii) _____	(iii) _____

Figure 20

- (b) Write any **six (6)** types of materials used to build houses in Zambia. [12]
- (c) When evaluating a completed artefact to check if it is successful or not, it is necessary to consider a number of factors. List **five (5)** of them. [5]

- 35 (a) **Figure 21** shows an incomplete Table of electrical components. Fill in the missing details. [18]

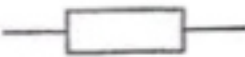
S/N	Component	Symbol	Use
(i)	Electric wire	(i)	(ii)
(ii)	Earth	(iii)	(iv)
(iii)	(iv)		(vi)
(iv)	Voltmeter		(vii)
(v)	(viii)	(ix)	Source of electrical energy.

Figure 21

- (b) What is the unit of measure for electricity? [2]