



Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sportontwikkeling
Lefapha la Thuto le Tihabololo ya Metshameko

NORTH WEST PROVINCE

NORTH WEST PROVINCIAL ASSESSMENT

GRADE 9

TECHNOLOGY
NOVEMBER 2017

MARKS: 120

TIME: 2 hours

This question paper consists of 17 pages.

Instructions to learners:

1. Read all instructions carefully.
2. Answer all questions.
3. Write neatly and legibly.
4. Use the grid papers provided to answer questions 5.3 and 10.

Resources needed for drawing

1. Pencil (HP)
2. Eraser/Rubber
3. Calculator
4. Mathematical instruments

SECTION A**QUESTION 1**

1.1 Choose the correct answer from the ones given below. Write the letter of the correct answer next to the question number. Example 1.1.6 D

1.1.1 When investigating designs we need to consider...

- A Fitness for purpose
- B Any design
- C Other things related to the design
- D What the designer does not want to do (1)

1.1.2 Evaluation of a design is done to suit...

- A What you are thinking about the design
- B Design specifications
- C Design lines
- D Systems (1)

1.1.3 Which lines are used to communicate in technology?

- A Construction lines
- B Design lines
- C Convention lines
- D Sketching lines (1)

1.1.4 The idler gear ensures that the driver and the driven gears ...

- A Operate without losses
- B Rotate fast
- C Rotate in opposite directions
- D Rotate in the same direction (1)

1.1.5 Statement that describes how the designer intends to solve problem is called ...

- A Design process
- B Evaluation
- C Communication
- D Design brief (1)

1.1.6 The force that draws a structure apart at its ends and tears up is called ...

- A Compression force
- B Torsion force
- C Shear force
- D Tension force

(1)

1.1.7 Cross bracing is used to ...

- A Resist twisting in the beams, poles and struts
- B Act on structures
- C Hold huge main cables
- D Bend structures

(1)

1.1.8 The following object is known as a ...



- A Cam cleat
- B Pulley
- C Block and tackle
- D Sprocket and chain

(1)

1.1.9 According to Pascal's principle, the pressure exerted on one side of the hydraulic system is transferred ...

- A Equally to all parts of the system
- B Without any losses
- C In all directions to other parts of the system
- D All of the above

(1)

1.1.10 A beam which is supported at one end only is known as ...

- A Clapper bridge
- B Suspension bridge
- C Arch bridge
- D Cantilever bridge

(1)

[10]

- 1.2 State whether the following statements are true or false. Write answers only.
- 1.2.1 Cam and cleat are used as controlling mechanisms in pulley ropes. (1)
 - 1.2.2 Galvanisation prevents corrosion. (1)
 - 1.2.3 Rack and pinion gears are used in bicycles. (1)
 - 1.2.4 A disc brake system consists of a brake disc, a calliper and brake pads. (1)
 - 1.2.5 Static load is also known as dynamic load. (1)
- [5]**

QUESTION 2

- 2.1 Read the scenario below and answer the questions that follow.

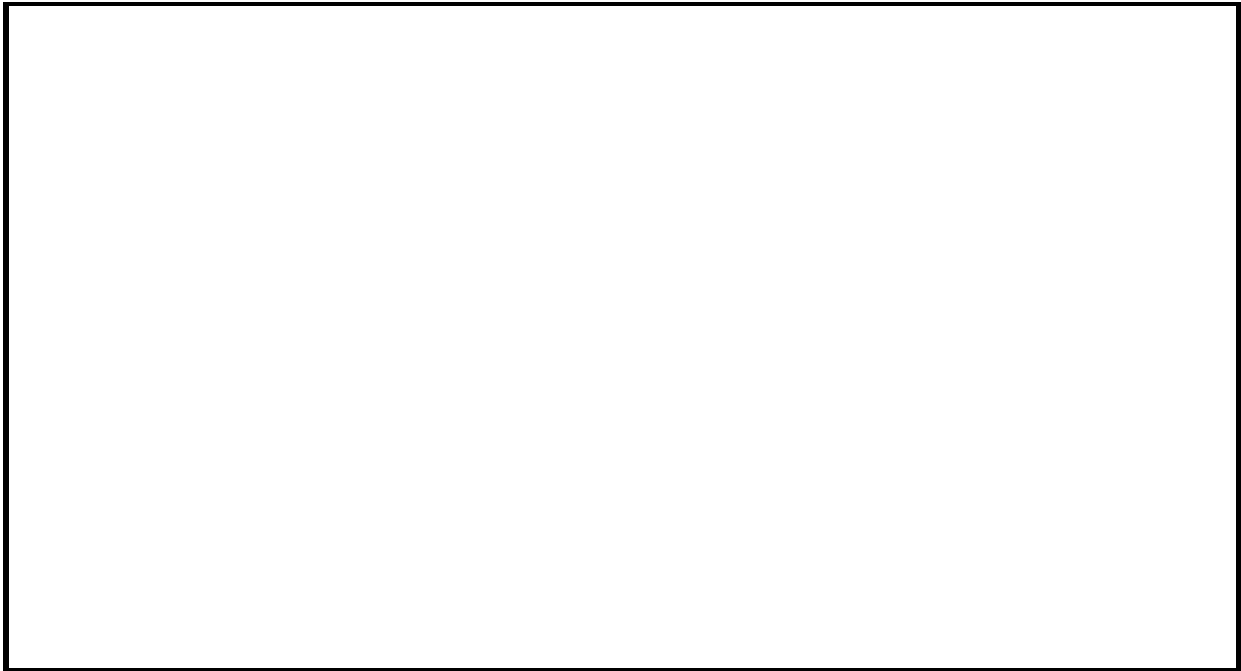
A rural community in the Karoo has been split down the middle by a donga. In the Karoo, long periods of drought are often followed by very heavy rain and flooding. A little rut in the road has become a deep donga. On the one side of the donga are the shops, the school and the community hall. On the other side are the houses. It is difficult and dangerous for young children and old people to cross the donga.

The municipal manager has asked grade 9 technology learners to design and make a model for a low cost bridge for pedestrians at a point where the donga is 6m wide.

- 2.1.1 Identify the problem in the scenario above. (2)
- 2.1.2 Write a design brief for a solution to the problem in the scenario above. (2)
- 2.1.3 Write ONE reason why crossing a river is dangerous. (1)
- 2.1.4 What negative effect does a bridge have on the environment? (1)
- 2.1.5 Give TWO types of materials that can be used in building these bridges. (2)
- 2.1.6 Suggest any TWO ways in which this problem can be resolved. (2)

2.1.7 What is the indigenous way of solving this problem? (1)

2.1.8 Draw a rough sketch to show how this problem can be solved.
Use the space provided (4)



[15]

QUESTION 3

3.1 Write the correct term from the list below that correspond with the explanations of properties of material next to it.

Write only the answer Example 3.1.6 brittleness

Malleability, stiffness, ductility, hardness, conductivity, strength, brittleness

3.1.1 Measure how good a material is at resisting or becoming deformed when acted on by a force. _____ (1)

3.1.2 The ability of a material to withstand being cut, scratched or dented. _____ (1)

3.1.3 The ability of a material to be stretched. _____ (1)

3.1.4 The ability of a material to change its shape without cracking. _____ (1)

3.1.5 The ability of a material to resist deformation by bending. _____ (1)

[5]

QUESTION 4

Match the description in Column A to the correct answer in Column by writing only the question number and the letter of the correct answer

COLUMN A	COLUMN B
4.1 A mechanism that allows the rotation in one direction only.	A Light Emitting Diode
4.2 A system in which compressed fluids are used.	B Care of equipment and tools
4.3 Wear gloves when handling sharp objects.	C Hydraulic system
4.4 Paint brushes are cleaned after being used.	D Ratchet and pawl
4.5 The logic gate that can be best explained by using two switches connected in parallel in a circuit.	E AND gate
	F Safety measure
	G OR gate

[5]

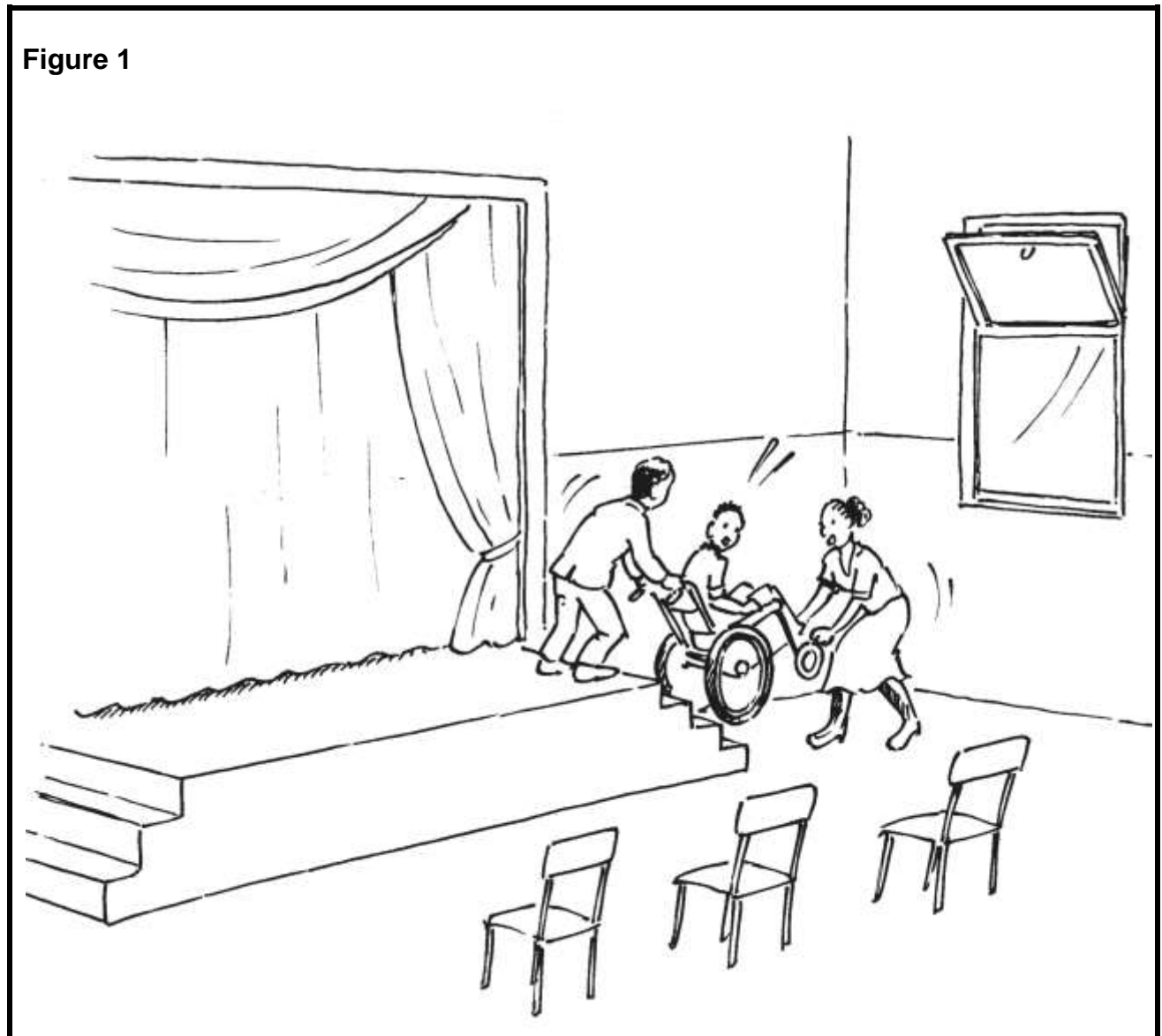
QUESTION 5

5.1 Study the diagram below and explain what is happening. (2)

5.2 Suggest a way to improve the design of the structure. (1)

5.3 Draw your solution in the grid provided. (4)

[7]

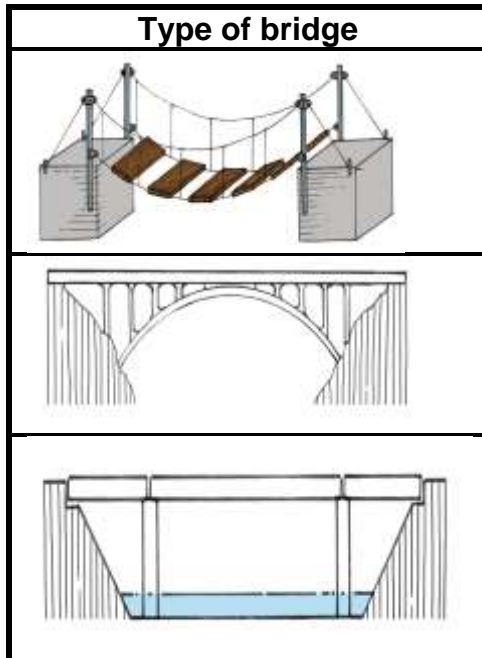


TOTAL SECTION A: 47

SECTION B

STRUCTURES**QUESTION 6**

Study the following types of bridges and answer the questions that follow.



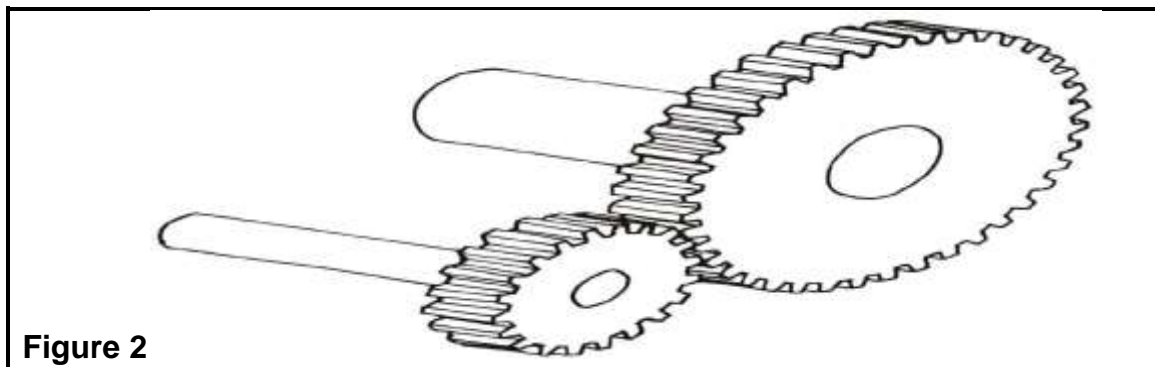
- 6.1 List ONE advantage and disadvantage of each of the bridges above. (6)
- 6.2 Identify the TWO loads that act on structures. (2)
- 6.3 Name TWO factors that could cause a structure to collapse (2)
- 6.4 In order for a structure to be strong, it depends on a number of factors.
List at least THREE factors that could make a structure strong. (3)

TOTAL SECTION B: 15

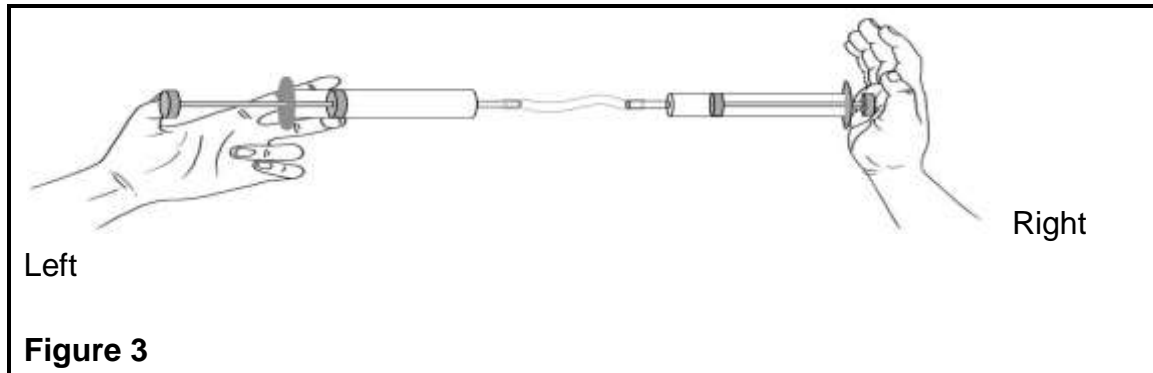
SECTION C

SYSTEMS AND CONTROL (MECHANICAL)**QUESTION 7**

- 7.1 Give an example of where each of the following components are used in real life:
- 7.1.1 Ratchet and pawl (1)
 - 7.1.2 Cleat (1)
 - 7.1.3 One-way valve (1)
- 7.2 Draw a sketch of a cam cleat and indicate how a cam cleat works. (4)
- 7.3 Draw a systems diagram of the gear train shown below. The driver gear has 45 teeth and the driven gear has 15 teeth. (6)
- 7.4 How many revolutions will the driven gear for every full revolution of the driver gear? (2)

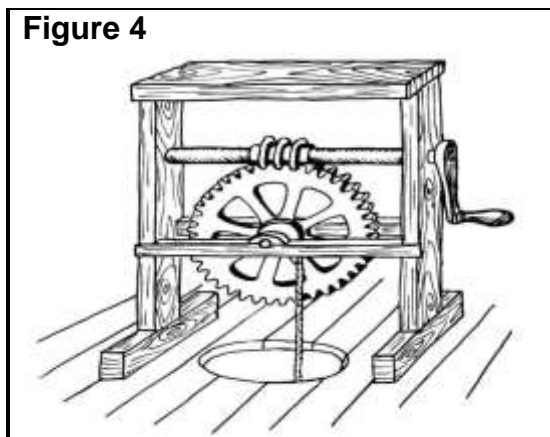


- 7.5 Study the diagram below and answer the questions that follow.



7.5.1 When the plunger on the left is pressed in, the plunger on the right presses against the hand. Will the pressure on the hand be the same with a pneumatic system as with a hydraulic system? Explain your answer. (3)

7.6 Identify the type of gear shown below. (2)



7.7 Write a reason why we use this type of gear. (2)

TOTAL SECTION C: 22

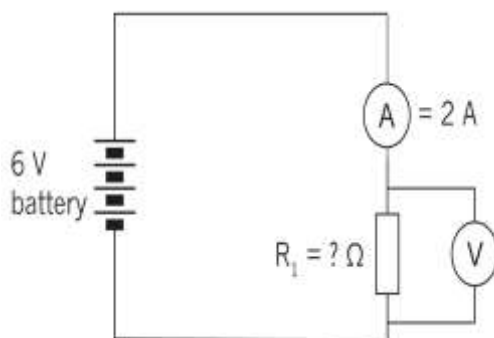
SECTION D

SYSTEMS AND CONTROL (ELECTRICAL)**QUESTION 8**

8.1 Study the circuit diagram below.

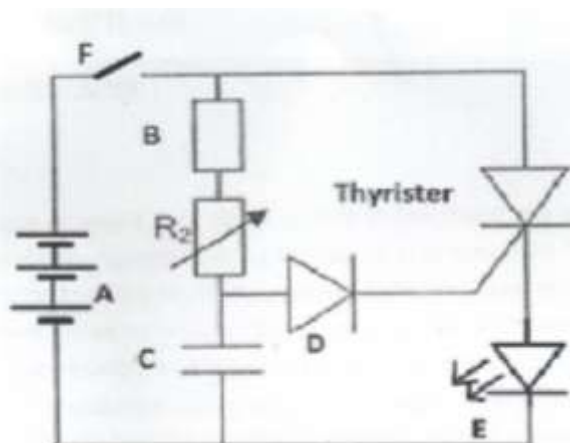
8.1.1 Calculate the value of the resistance in the circuit below if the current has a value of 2A and the voltage across the resistor is 6 V as in the figure below. Use the formula given.

$$\text{Current (I)} = \frac{\text{Voltage (V)}}{\text{Resistance (R)}}$$



(3)

8.2 The diagram below shows a light dimmer circuit diagram. Use this diagram to answer the questions that follow.



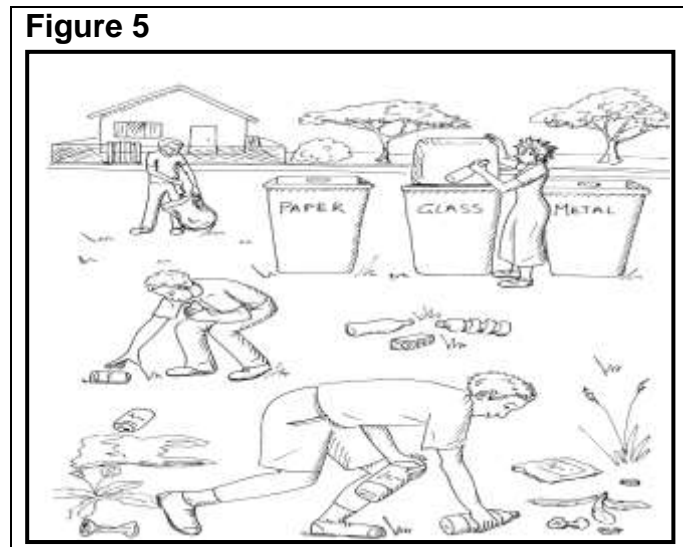
8.2.1 Give the names of the parts labelled A-F (6)

8.3 Define Ohm's Law. (2)

TOTAL SECTION D: 11**SECTION E**

PROCESSING**QUESTION 9**

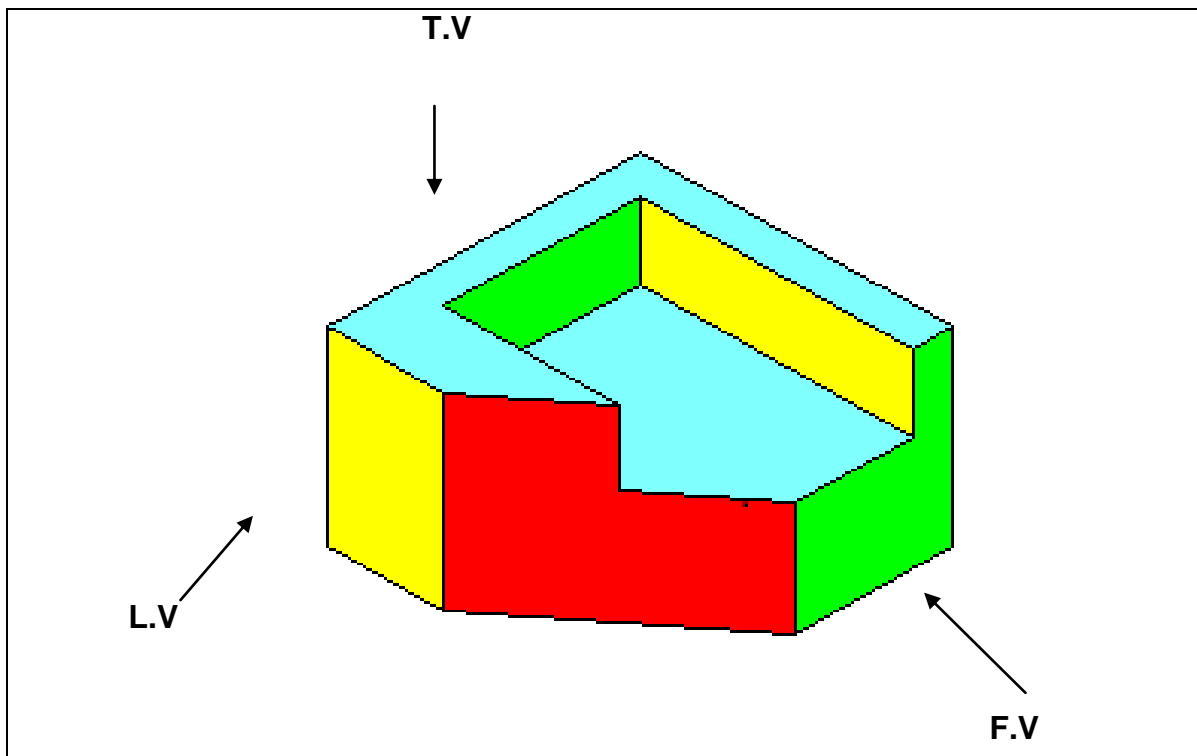
- 9.1 List THREE ways in which metals can be preserved. (3)
- 9.2 Name ONE structure where grains can be stored. (1)
- 9.3 A diagram below shows a school recycling project. Answer the questions that follow.



- 9.3.1 Identify the THREE materials found in the diagram below. (3)
- 9.3.2 From which of the THREE materials identified will the school make more money. (2)
- 9.4 Give TWO advantages of recycling these materials. (2)
- 9.5 List any TWO dangers that this community may be exposed to if they burn the material instead of recycling them. (2)
- 9.6 Why should plastics be separated into different types before it can be recycled? (2)
- 9.7 In many schools chairs are made of plastic not wood or steel. Explain why? (2)
- 9.8 Which material is flexible between wood and plastic?
Give a reason for your answer. (2)

TOTAL SECTION E: 19**QUESTION 10**

- 6.1 Draw an object below in First Angle Orthographic projection using the grid provided. Show the Top view, Front view and the Left view. (10)



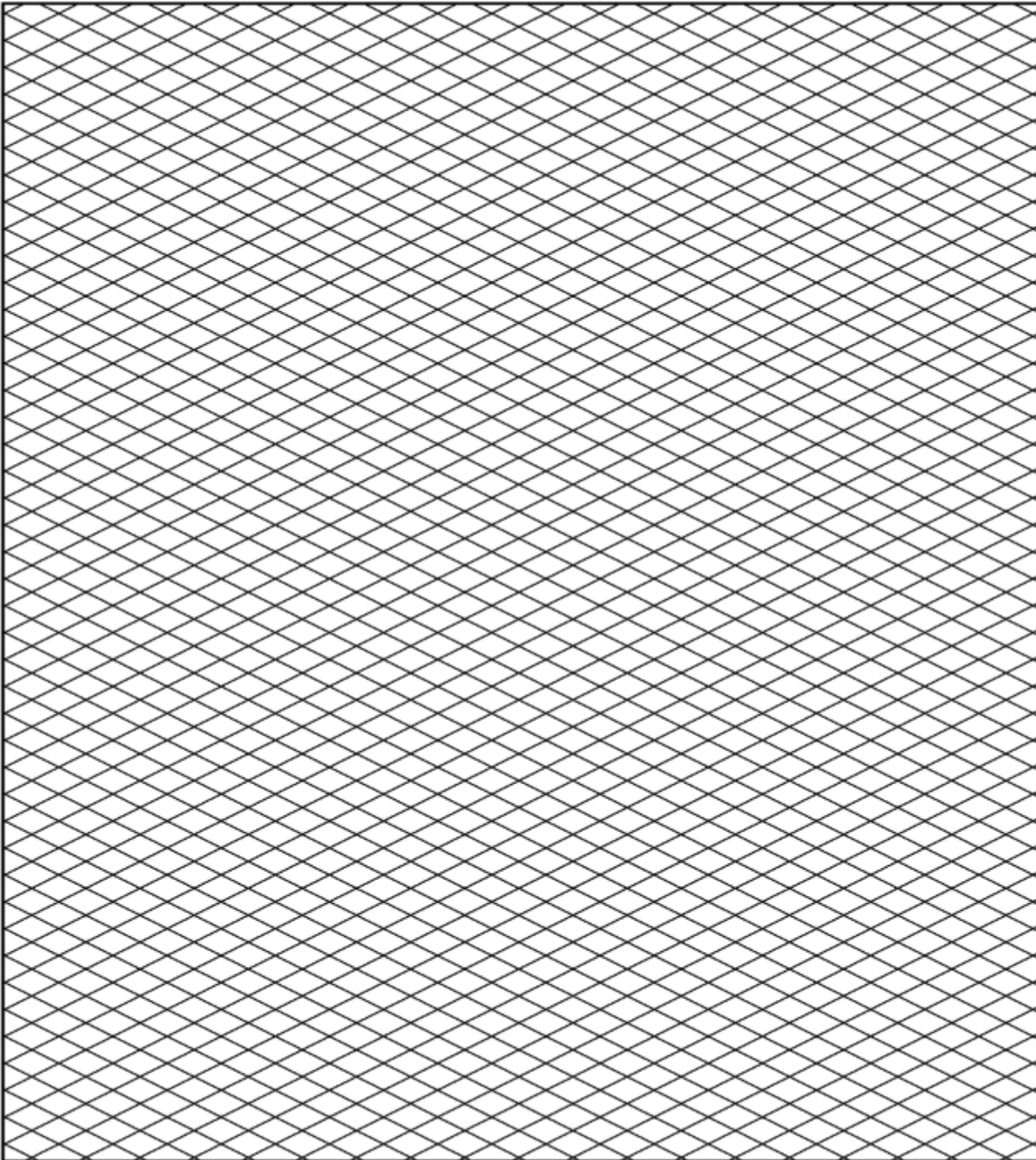
NB: Dimensions on the grid paper (1Block:10mm).

Rubric for Question 6

Criteria	Total Mark	Obtained Marks
Correct placement of views	2	
Correctness of Front view	2	
Correctness of Side view	2	
Correctness of Top view	2	

GRAND TOTAL: 120

NAME: _____ SCHOOL: _____



Rubric for question 5.3

Criteria	Total mark	Mark allocated
The ramp should be wide enough for a wheelchair	2	
NB: if a learner has added a hand rail, allocate a mark	1	
Neatness of the drawing	1	

NAME: _____ SCHOOL: _____

