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Iphondo leMpuma Kapa: Isebe leMfundo
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Porafensie Ya Kapa Botjhabela: Lefapha la Thuto

TECHNOLOGY

GRADE 9

JUNE 2025

LEARNER NAME:

CLASS:

SECTION A		SECTION B		SECTION C	
DESIGN SKILLS		TECHNOLOGY CONCEPTS AND KNOWLEDGE		THE IMPACT OF TECHNOLOGY ON THE ENVIRONMENT	
QUESTION 1	50	QUESTION 3	30	QUESTION 4	20
QUESTION 2					

INSTRUCTIONS:

1. ANSWER ALL QUESTIONS.
2. USE THE SPACES PROVIDED TO ON THE QUESTION PAPER TO ANSWER .

3. MAKE SURE YOU HAVE YOUR NAME ON THE ANSWER BOOK.**SECTION A****S A 1 DESIGN PROCESS SKILLS****QUESTION 1**

Choose the correct answer from the given possible answers. Circle the correct one on your answer sheet.

1.1.1 The type of line shown below represents a/an.....



- A. Hidden detail line
- B. Construction line
- C. Outline
- D. Dimension line

1.1.2 Which one of the following will be used to guide the designer in the completion of a drawing?

- A. Centre lines
- B. Dashed lines
- C. Outlines
- D. Construction lines

1.1.3 An isometric drawing is a 3D drawn at

- A. 180°
- B. 90°
- C. 45°
- D. 30°

1.1.4 Colour, texture and shadows can be used to.....

- A. Enlarge the drawing
- B. Decrease the drawing.
- C. Enhance the drawing.
- D. Modernise the drawing.

1.1.5 A square grid can be used to draw a/an.....

- A. Orthographic drawing
- B. an isometric drawing
- C. a four dimensional drawing
- D. parallel lines

1.1.6 Free hand drawing is also known as.....

- A. Accuracy
- B. Aesthetics
- C. Sketching
- D. Scaling

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

- A. What you are thinking about the design.
- B. Design specifications.
- C. Design lines
- D. Sketching lines.

1.1.8 In Technology drawing, Scale 1:2 means that the drawing is drawn at.....

- A. the actual size of the model.
- B. two times the size of the model.



C. half the size of the model.

D. twelve times the size of the model.

1.1.9 The main purpose of dimensioning in graphic communication is to make sure that the drawing

A. is neat

B. is accurate

C. informs the reader about the size.

D. is complete

1.1.10 Dashed lines in a drawing represent

A. Outlines

B. Centre lines

C. Hidden details

D. Construction lines.

(10)

1.2

Read the scenario below and answer the questions that follow.

SCENARIO

Nelson Mandela High school has a new community hall. A staircase and wheelchair ramp is needed for the stage in the hall. The principal made a list of specifications that should be kept in mind when designing the staircase and the wheelchair ramp. The specifications are as follows:

- The stairs and ramp must be made in two units that are movable.
- The unit should fit in front of the stage so that people can walk onto the stage and a wheelchair can go up and down the ramp.
- The stage is 600 mm high.
- The stairs should be wide enough for two people to move side by side at the same time; 1 000 mm.
- There should be 3 steps of 200 mm high each.
- The flat part (riser) of each step is 600 mm long.
- The ramp should be wide enough for one wheelchair, 1 000 mm.
- The base of the ramp should be 1 800 mm long.

1 Write down a design brief for a solution to the problem identified in the scenario above. (2)

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Identify the problem that led to the building of a staircase and a ramp. (2)

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3 Neatly draw a free hand, three-dimensional sketch of the combined staircase and ramp. (Include dimensions in the correct places on your drawing.)

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(9)

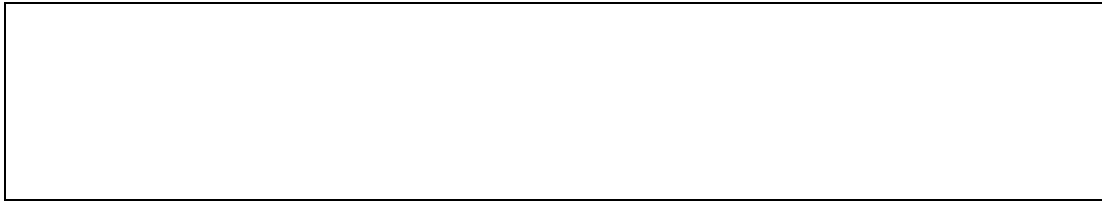
1.2.4. Compare the properties of the following materials that can be used to make the stairs and the ramp.

(4)

Wood	Concrete

1.2.5 Give three factors to consider when designing a ramp.

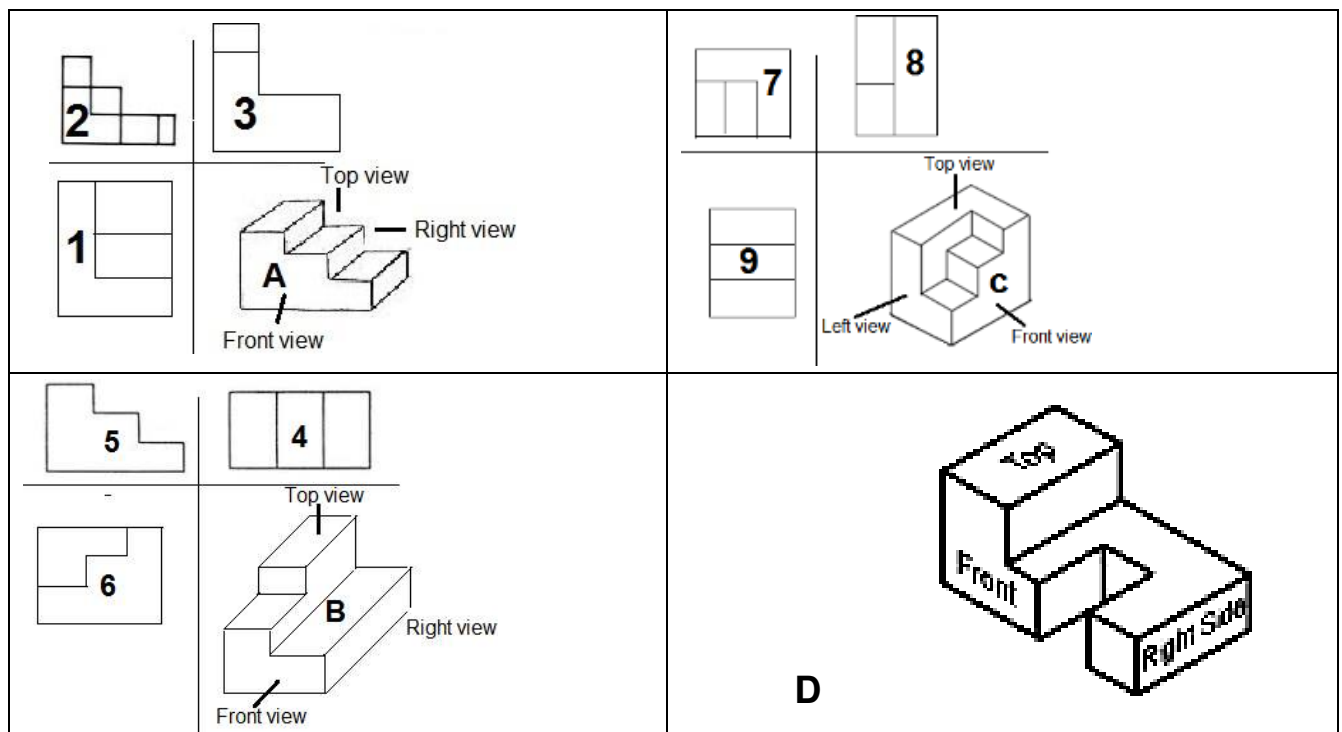
(3)



1.2.5 If we decide to use the following building materials for building the structure above. Calculate the total amounts. Show your calculations

[5]

Item	Purpose	Unit Price	TOTAL
Cement	Foundations(3 bags) stair and ramp (6 bags)	R70 per bag	
Gravel	Foundations($1\frac{1}{2}$ loads needed)	R300 per load	
River sand	Foundation 1 load needed	R350 per load	
Bricks	For stairs and ramp 200 bricks	R2.50 each	
	TOTAL		



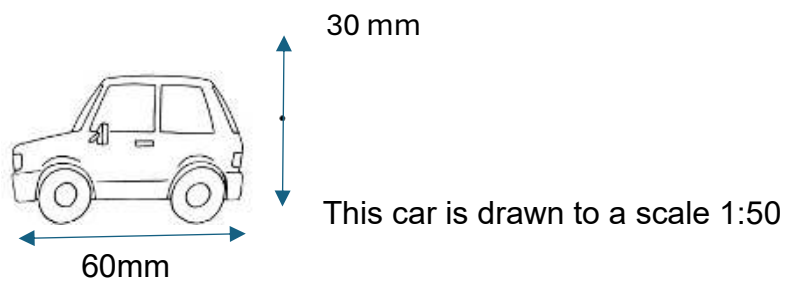
1.3.1 Match the sides of the drawing as shown in the example below. /5 marks/

- a) Number _____ is the top view of **B** [1]
 b) Number _____ is the front view of **C** [1]
 c) Number **3** is the front view of _____ [1]
 d) Number **9** is the right view of _____ [1]
 e) Number **5** is the _____ view of **A** [1]

1.3.2 The front view of A shows the face of the stair case and the right view is drawn at degrees. [2]

QUESTION 2

2.1



2.1.1 Calculate the length and the height of the real car using the given dimensions. [4]

Length	height
(2)	(2)

2.2 Name two set squares that are used when drawing isometric and oblique drawings. (2)

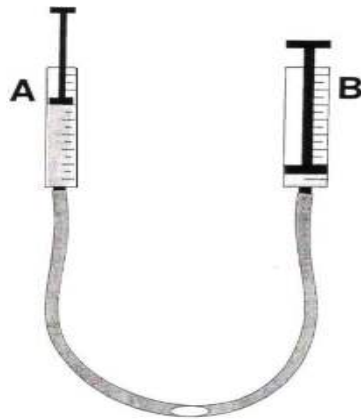
1. 2.

2.3 Explain the meaning of scaling up and give an example where it is used. (2)

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SECTION B**SA 2 TECHNOLOGY CONCEPTS AND KNOWLEDGE****QUESTION 3**

3.1 Zinzi has connected two syringes to make a model of a hydraulic system. Syringe B has four times more cross-sectional area than Syringe A.



3.1.1 If A is the master cylinder and B is the slave cylinder, what force will be experienced at B if a force of 50N is applied to the plunger in cylinder A?

[1]

3.1.2 If plunger A moves a total distance of 8cm, how far will plunger B move?

[2]

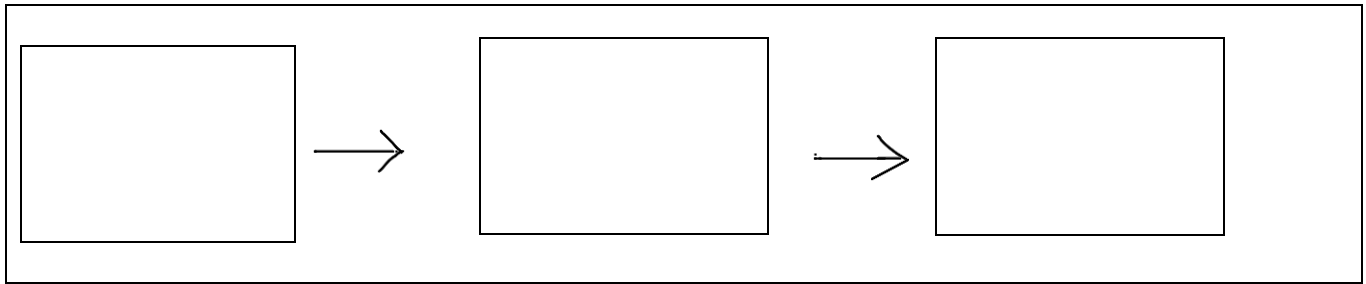
3.1.3 If 3ml of water is forced out of cylinder A, how much water will enter cylinder B?

[2]

3.1.4 Zinzi has carelessly allowed an air bubble into her hydraulic system. What effect will the presence of this bubble have on the amount of force transferred by water from A to B

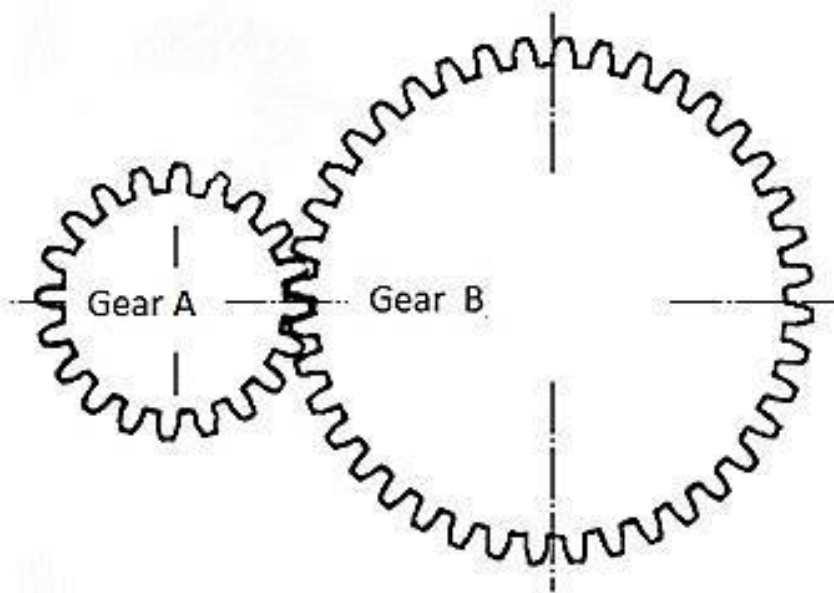
[2]

3.1.5 Draw a systems diagram that describes how a hydraulic jack functions. [3]



3.2 The diagram below shows a typical gear train. Gear A is connected to a motor. Study the diagram and answer the questions that follow.

(When gear A rotates 10 times, gear B rotates 5 times)



3.2.1 Identify the DRIVEN gear. [1]

3.2.2 Give a reason for your answer in QUESTION 2.2.1. [1]

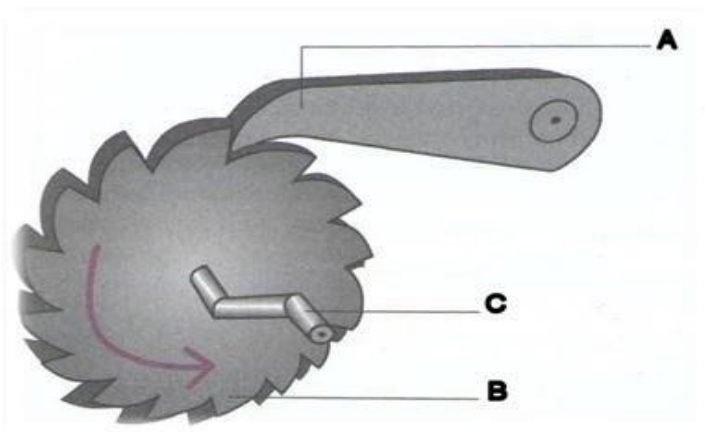
3.2.3 Gear A rotates in a clockwise direction. In which direction will gear B rotate? [1]

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3.2.4 Calculate the velocity ratio of this gear system if gear A has 20 teeth and gear B has 40 teeth. [3]

--

3.3 The mechanism below is an important control device used in many systems.



3.3.1. Name the parts labelled A, B and C. [3]

A.
B.
C.

3.3.2 What is the purpose of part C in the above mechanism? [1]

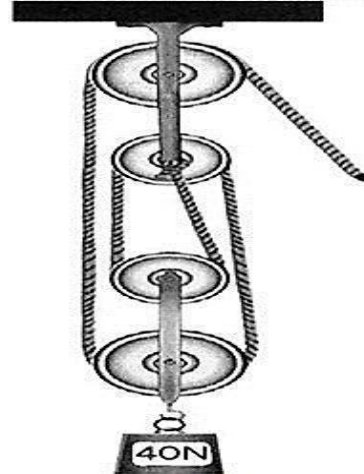
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3.3.3 Give ONE example of a device that uses this locking system. [1]

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3.4 Study the sketch below and answer the questions that follow.

- In the lifting pulley system below a load of 40 N is lifted over a distance of 1 m.

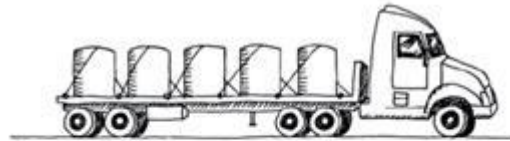


Calculate the force needed to lift the load.

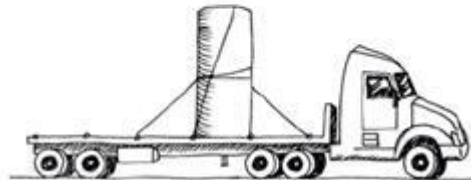
(3)

3.5 Observe the loads on truck A and B and answer the questions

Truck A



Truck B



Truck C



Compare the type of loads and forces in the trucks above.

	TRUCK A	TRUCK B	TRUCK C
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TYPPE OF LOAD	(1)	(1)	(1)
DITRIBUTION OF LOAD			
Ie. Even/uneven	(1)	(1)	(1)
FORCE EXERTED ON THE TRUCK	(1)	(1)	(1)

[9]

SECTION C

SA 3 THE IMPACT OF TECHNOLOGY ON THE ENVIRONMENT

PEDESTRIAN BRIDGE OVER N2



With the busy N2 cutting across two residential areas on either side of the road. Basic amenities like schools, shops and clinics are on one side. Countless accidents have been witnessed. The pedestrians found it difficult to cross the freeway especially during the pick hours and bad weather days, as a result learners were absent from school frequently. The elders and people who are wheelchair bound find it almost impossible to cross and get to the clinic. With these accidents and difficulties in consideration the residents marched to the local government offices protesting for safe community. The local government in partnership with the provincial government, saw it necessary to build a pedestrian crossing linking the two residential areas. This bridge has both a stairs a ramp, accommodating pedestrians with different physical needs

4.1 What moved the government to build a bridge in this community? (2)

--

4.2 Which two groups of people are mostly affected when they have to cross the bridge.(2)

--

4.3 Which materials can be used to build a strong bridge that will last for a long time. (2)

--

4.4 How did the following people benefit during the building of the bridge. (6)

(i) Vendors	
(ii) Unemployed locals	
(iii) Construction workers	

4.5 Before building this bridge trees have to be removed. What is the negative impact of this on the environment? (2)

--

4.6 Explain how the residents of these communities benefit from the building of the bridge. (6)

(i)
(ii)
(iii)

[20]

GRAND TOTAL 100