MAFIKENG HIGH SCHOOL

GRADE 9

TECHNOLOGY

JUNE 2023

MARKS: 80

DURATION: 2 Hours

NAME OF LEARNER: _____

CLASS: _____

INSTRUCTIONS

1. Answer all questions.
2. Write neatly and legibly.
3. All the answers should be written in the spaces provided in the question paper.
4. Follow instructions promptly.
5. You will need a Pencil, Mathematical Instrument, Eraser and a Calculator.
6. All the drawings should be in pencil, neat and fully labelled.
7. Coloured pencils may be used only for shading where such is required.

This question paper consists of 9 pages.

QUESTION 1

1.1 **Four possible answers are given. Circle (A) the letter of the correct one.**

1.1.1 In Technology drawing, Scale 1:2 mean that the drawing is drawn at … (1)

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.

1.1.2 The design brief clearly indicates … (1)

A what the designer is going to make to solve the problem.
B what the designer is going to ask about to solve the problem.
C what the designer does not want to do.
D what steps will be followed in problem solving.

1.1.3 According to Pascal's principle, the pressure exerted on one part of the hydraulic system is transferred... (1)

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.

1.1.4 The type of force that is exerted on the bridge by the vehicles passing over the bridge… (1)

A Stable force
B Static force
C Curving force
D Dynamic force

1.1.5 Hydraulic jack uses ..... to operate. (1)

A Gears
B fluids
C compressed gas
D fixed pulleys

[5]

1.2 State whether the following statements are ***TRUE*** or ***FALSE?*** Just write true or false in the space provided.

1.2.1 A dotted line is used to show hidden features on a drawing. (1)

_____

1.2.2 Orthographic projection is used to show various views of a part. (1)

_____

1.2.3 The pillars of a bridge is under tensile stress. (1)

_____

1.2.4 The design of stairways has to conform to building regulations. (1)

_____

1.2.5 A design brief is written by the client. (1)

_____ **[5]**

TOTAL QUESTION 1: [10]

QUESTION 2

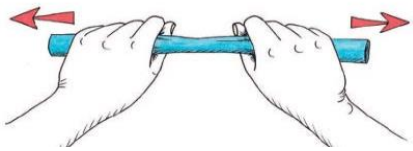
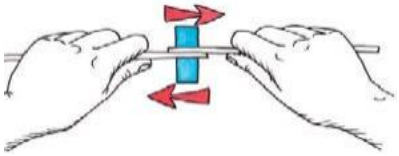
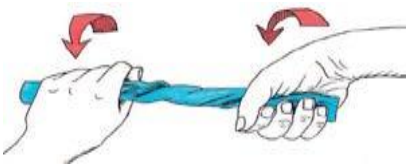
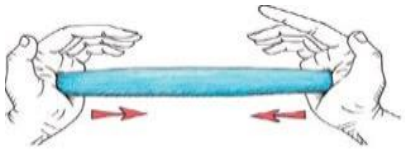
2.1 Give the NAMES and DESCRIPTION of the following line types as used on drawings. The answer should be written in the table as per given example. (8)

Line Convention	Name of line / Type	Property
E.g. ————————	Construction line	Very thin and continuous
	_____ _____	_____ _____
	_____ _____	_____ _____
	_____ _____	_____ _____
	_____ _____	_____ _____

TOTAL QUESTION 2: [8]

QUESTION 3

3.1 Match the type of force in **Column A** with its name in **Column B**. Write ONLY the letter of the appropriate name in the space provided. (4)

COLUMN A	COLUMN B
 3.1.1 ____	A. Compression
 3.1.2 ____	B. Torsion
 3.1.3 ____	C. Shear
 3.1.4 ____	D. Tension

3.2 Match the statements in COLUMN A with the correct answer in COLUMN B and write ONLY the letter of the correct answer in the space provided e.g. 3.6 _D_

COLUMN A	COLUMN B
3.1 ____: Torsion in structures can also be called	A – Corrosion B – Pneumatic C – Master cylinder D – Labour E – Twisting F – Slave cylinder G – Static force H – Dynamic force
3.2 ____: In hydraulic system the output cylinder is also known as	
3.3 ____: Systems that uses compressed gases are known as	
3.4 ____: The metals deteriorate when they are exposed to moisture	
3.5 ____: When doing a budget for a construction company one of the costs to be considered is	
	[5]

TOTAL QUESTION 3: [9]

QUESTION 4

SCENARIO

People from rural areas sometimes risk drowning each time they cross the river to the city. In some areas the rivers have dangerous crocodiles which also attack the people crossing. There are times when the villagers cross in groups and help each other.

4.1.1 Identify the problem in the scenario above.

_____

_____ (2)

4.1.2 Write a design brief to solve the identified problem.

_____

_____ (2)

4.1.3 Which TWO external forces are expected to act in your proposed solution?

_____

_____ (2)

4.1.4 Choose TWO materials that could be used in solving the problem. Give a property of each material that you chose.

_____

_____

_____

_____ (4)

4.1.5 In improving the safety of your solution, what additional features would you consider adding? Name any TWO.

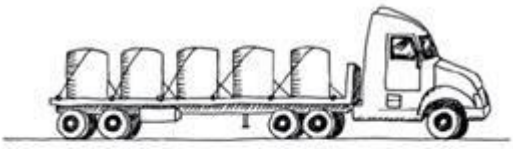
_____

_____ (2)

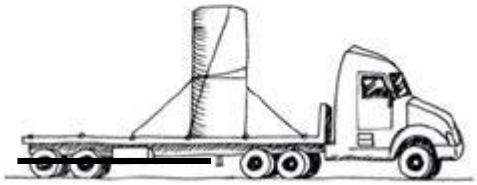
[12]

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

Truck A



Truck B



Complete the statements using the following words: **Static, Even, Uneven, Dynamic, Heavy**

4.2.1 The force exerted by the load onto the truck A is called a _____force and the load is Distributed _____ across the entire trailer. (2)

4.2.2 The load on truck B is said to be an _____ load and the force between load and trailer is also_____. (2)

4.2.3 If the truck is <u>moving</u>, the force exerted by the wheels onto the road is called a _____ force. (1)

4.2.4 When a structural member is under load, it can experience 3 types of forces. (3)

Name them:

1. _____

2. _____

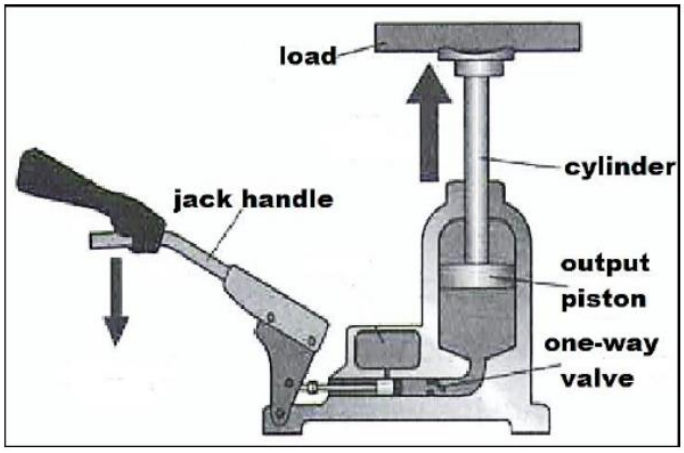
3. _____

[8]

TOTAL QUESTION 4: [20]

QUESTION 5

DIAGRAM OF A HYDRAULIC JACK



5.1.1 What is a hydraulic system?

_____

_____ (2)

5.1.2 Describes the way a hydraulic jack works. (6)

INPUT	PROCESS	OUTPUT

5.1.3 A car lift hydraulic system is used to lift a car of 2500kg. An input force of 5000 N is applied to the piston. What is the Mechanical advantage of this car? (Hint: remember to convert to SI unit)

_____

_____

_____

_____ (4)

5.1.4 What is a pulley?

_____

_____ (1)

5.1.5 In what way does a pulley system make work easier?

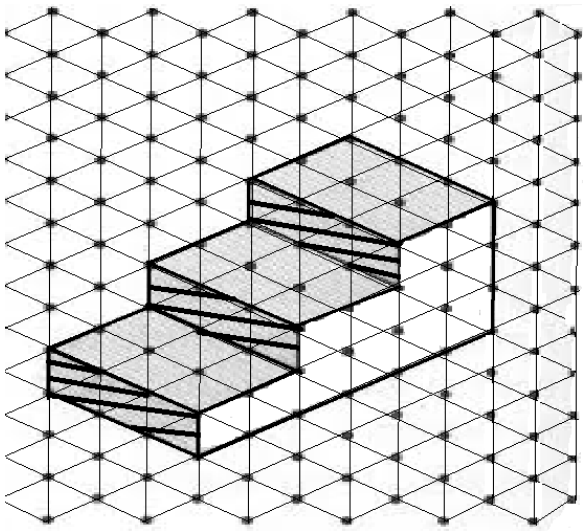
_____

_____ (2)

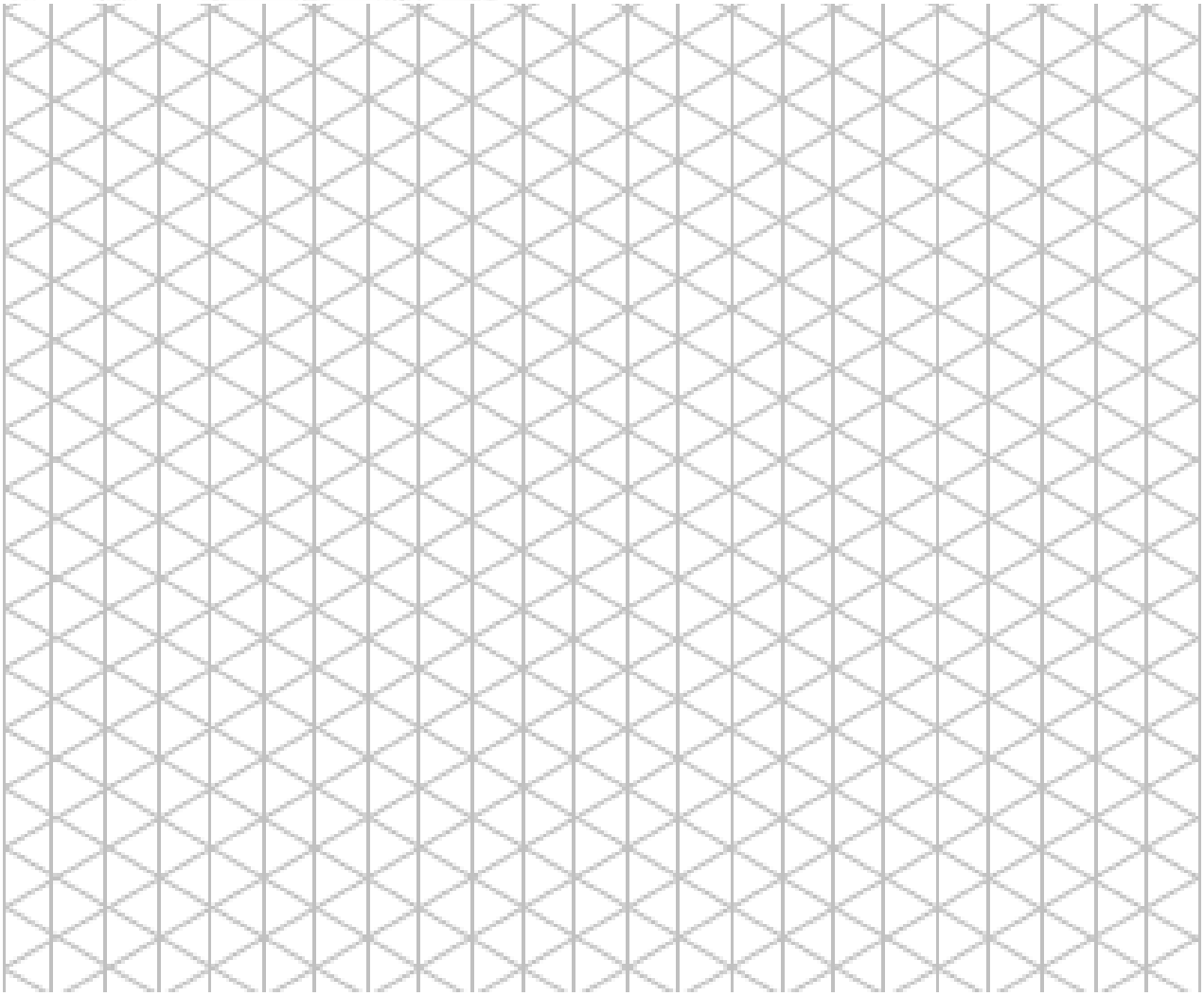
TOTAL QUESTION 5: [15]

QUESTION 6

6.1 Redraw the staircase below in the provided empty isometric grid using the scale 1:1. (8)



ASSESSMENT CRITERIA	MARK	MARK
Isometric view (3 edges)	3	
3 Steps	3	
Correctness	2	
TOTAL	8	



6.2 Draw not to scale, the first angle projection of the given isometric drawing in 6.1 (10)

Front View

Side View

Top View

ASSESSMENT CRITERIA	**MARK**	**MARK**
Top view	3	
Front view	3	
Side view	3	
Neatness	1	
TOTAL	**[10]**	

TOTAL QUESTION 6: [18]

GRAND TOTAL: [80]