HILLCREST HIGH SCHOOL

Grade 8

TECHNOLOGY

NOVEMBER 2025

MARKS: 110 **EXAMINER:** Mrs Magubane

TIME: 2 Hours **MODERATOR:** Mrs Tonkin

SECTION		MARKS	TIME (minutes)
QUESTION 1:	Short questions (All topics)	40	40
QUESTION 2:	Impact of Technology	15	20
QUESTION 3:	Structures	15	20
QUESTION 4:	Mechanical Systems	20	20
QUESTION 5:	Electrical Systems	10	20
QUESTION 6:	Graphic Communication	10	20
TOTAL:		**110**	**120**

INSTRUCTIONS

1. The question paper consists of 6 questions and 6 pages including the cover page.
2. A calculator may be used.
3. Write your Technology teacher's name on your answer booklet.
4. Technological based answers must be written.
5. All drawings/sketches must be completed using a sharp pencil and drawing instruments unless otherwise instructed.
6. Marks will be deducted for untidy work especially drawings/sketches.

QUESTION 1 SHORT QUESTIONS [40]

1.1. Choose the correct answer and write only the letter (A – D) next to the question numbers (1.1.1. – 1.1.20.) in the ANSWER BOOK. EG: 1.1.21. D (10)

1.1.1. The strongest shape to use when making a structure is…
- A a circle
- B a hexagon
- C a rectangle
- D a triangle

1.1.2. A structural member that is mounted diagonally in a structure is called…
- A a column
- B a pile
- C a strut
- D a beam

1.1.3 A dam is an example of which type of structure?
- A frame structure
- B shell structure
- C complex or compound structure
- D mass structure

1.1.4. A horizontal structural member is called …
- A beam
- B column
- C tie
- D strut

1.1.5. A vertical structural member is called …
- A beam
- B strut
- C tie
- D column

1.1.6. When two gears are touching, they are…
- A matching
- B meshing
- C mixing
- D mashing

1.1.7. The movement of two gears that are connected by an idler gear is called
- A asynchronous rotation
- B counter revolution
- C synchronous rotation
- D counter rotation

1.1.8. When a bridge or building collapses when it should not have, it is called..

A structural weakness
B poor design
C structural failure
D failure of design

1.1.9. If a structure falls over it has

A toppled
B collapsed
C crashed
D failed

1.1.10. An arch

A is held together by compressive forces
B is a square shape
C was first used about 100 years ago
D can span longer distances than beams

1.2. State whether the following statements are TRUE or FALSE. (10)

1.2.1. A shell structure is hollow and can be used to keep things safe.
1.2.2. A golf ball is an example of a solid structure.
1.2.3. An electric pylon is a shell structure.
1.2.4. A suspension bridge is used to span over a short distance.
1.2.5. A lintel is a beam above a window or a door.
1.2.6. An arch beam cannot be made from stone.
1.2.7. An aeroplane's wings are examples of a cantilever.
1.2.8. A queen post is a truss with two supporting beams attached to the tie beam.
1.2.9. Cross bracing weakens the structural members and collapses.
1.2.10. All plastics are recyclable.

1.3. Choose the correct definition from COLUMN B that matches the term from COLUMN A. Write only the letter (A – F) next to the question numbers (1.3.1. – 1.3.5.). EG: 1.3.6. G (5)

COLUMN A		COLUMN B	
1.3.1.	Shear	A	Pushes against a member
1.3.2.	Torsion	B	Pulls a member apart
1.3.3.	Tension	C	Slides one part of a structure past another part
1.3.4.	Compression	D	A structure starts to curve because a force is being applied from above
1.3.5.	Bending	E	A object breaks due to too much pressure being applied
		F	Turns a member in two different directions

1.4. Choose the correct example from COLUMN B that matches the term from COLUMN A. Write only the letter (A – F) next to the question numbers (1.4.1. – 1.4.5.). EG: 1.4.6. G (5)

COLUMN A		COLUMN B	
1.4.1.	Wedge	A	Scissors
1.4.2.	Wheel and axle	B	Axe
1.4.3.	First class lever	C	Ramp
1.4.4.	Crank	D	Trolley
1.4.5.	Inclined plane	E	Office punch
		F	Small mechanical children's car

1.5. Give the correct term for each of the descriptions below. Write only the word / term next to the question numbers in the answer book. (5)

1.5.1. A control device that allows current to flow in one direction only and emits light.
1.5.2. Components that are connected in the same straight line.
1.5.3. A mechanism that changes rotary motion into reciprocating motion.
1.5.4. Substances and products that do not have a negative effect to the environment.
1.5.5. The energy that is produced by the sun.

1.6. Choose the correct word/ term in brackets. Write only the word/ term next to the question numbers in the answer book. (5)

1.6.1. (Queen / King) posts are the most common type of roof truss.
1.6.2. The mechanism that is used to guide a cam is called a (camshaft / follower).
1.6.3. A/An (AND / OR) logic table is similar to a series circuit.
1.6.4. A circular or turning motion is called (reciprocation/ rotary)
1.6.5. Another name for a 2D drawing is called an (orthographic/ isometric) drawing

QUESTION 2 IMPACT OF TECHNOLOGY [15]

2.1. List THREE advantages of technology (3)

2.2. Define the following terms: (5)

2.2.1. Corrode
2.2.2. Oxidise
2.2.3. Neutralise
2.2.4. Water table
2.2.5. Emissions

2.3. Read the following article and the questions that follow:

Technology has advanced in such a way that plastic products are now manufactured to be biodegradable . Environment activist are urging humanity to reduce, reuse and recycle materials as the principles of environment sustainability. Companies are also actively involved in

changing their packaging from plastic bags to paper bags, some are using polyester and acrylic fibres to make shopping bags which is convinient for consumers to re use on their next shopping spree.

2.3.1. Define the term biodegradable (2)
2.3.2. Name three principles of sustainability meantioned in the article. (3)
2.3.3. Name TWO ways, from the article, in which companies are using to reduce the plastic wastage. (2)

QUESTION 3 STRUCTURES [15]

3.1. Read the following extract and answer the questions that follow:

"*Structural failure refers to the loss of structural integrity, or the loss of load-carrying capacity in either a structural component or the structure itself*."

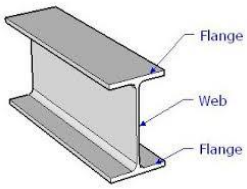
3.1.1. Name THREE ways in which structure can fail. (3)
3.1.2. Explain how top-heavy toppling over happens on structures. (2)

3.3. Study the pictures of structures below and answer the questions that follow:

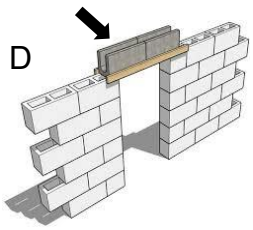
A

B

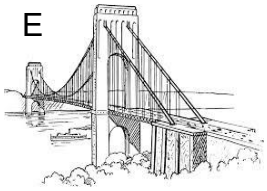
C



D



E



F

3.3.1. Name each structure A – F (6)
3.3.2. Explain the difference in structure between these types of bridges shown at E and F. (2)
3.3.3. Classify the structures at B and C. Are they (man-made or natural) and are they (frame/ solids/ shell) structures. (2)

QUESTION 4 MECHANICAL SYSTEMS [20]

4.1. Read the following extract and answer the questions that follow.

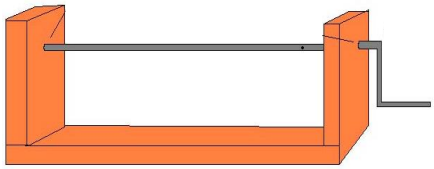
We use machines to make work easier and to do it faster. If we did not have mechanisms or machines, our daily tasks would be very difficult and would take a lot longer to complete. Mechanisms are unable to operate on their own. Mechanisms require energy, as well as someone to operate them. (Although many machines nowadays are computer operated). All mechanisms are to be operated to give us mechanical advantage.

4.1.1. Give the definition of a mechanism. (2)

4.1.2. Give the definition of a subsystem. (2)

4.1.3. Explain how to calculate the mechanical advantage of mechanisms. (1)

4.2. Look at the picture below and answer the questions that follow:



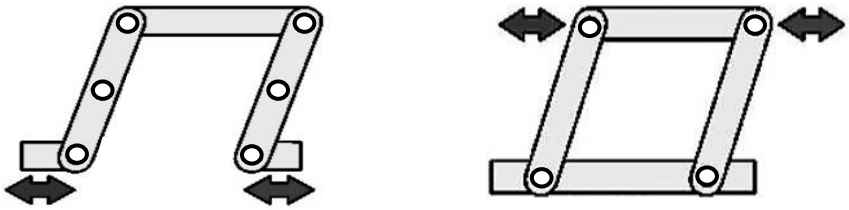
4.2.1. Identify the mechanism above. (1)

4.2.2. How does a crank work? (3)

4.2.3. What is the name given to two cranks that are joined together? (1)

4.3. Study the linkage systems below and answer the questions that follow

A B



4.3.1. Identify the linkages A and B above. (2)

4.3.2. Explain how the bell crank works and provide one example on where it can be used. (3)

4.4. Using the information below, work out the lever calculation to find the value of B. Round off your answer to one decimal place. (5)

A= 40kg B=35kg

a= 16N B=?

QUESTION 5 ELECTRICAL SYSTEMS [10]

5.1. Draw the following symbols for these components used in a circuit. (5)

5.1.1. Resistor

5.1.2. Electromagnet

5.1.3. Light emitting Diode

5.1.4. Transistor

5.1.5. Light dependent resistor

5.2. Draw a circuit diagram that has 6V battery, switch, light bulb and buzzer. (5)