



**HILLCREST HIGH SCHOOL**  
**TECHNOLOGY**  
**NOVEMBER EXAMINATION - 2018**  
**GRADE 8**

TOTAL: 120

TIME: 2 HOURS

EXAMINER: MRS J M BEGA

MODERATOR: MRS T TONKIN

NAME/SURNAME: \_\_\_\_\_

GRADE 8 \_\_\_\_

SUBJECT EDUCATOR: BEGA/MILLER/NAIDOO/TONKIN

**INSTRUCTIONS**

1. The question paper consists of 7 questions and 13 pages including the cover page.
2. Answer all questions on the answer sheet provided.
3. Write your name and grade clearly and neatly in the space provided.
4. Highlight your Technology teacher's name in the space provided.
5. Technological based answers must be written.
6. All drawings/sketches must be completed using a sharp pencil and drawing instruments unless otherwise instructed.
7. Marks will be deducted for untidy work especially drawings/sketches.

BEGA	MILLER	TONKIN	TOTAL	MODERATED MARK
			120	

**QUESTION 1: SHORT QUESTIONS**

**[20]**

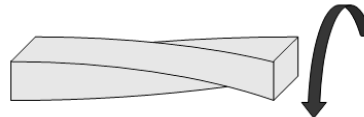
1.1. Various possible options are provided as answers to the following questions. Circle the correct answer on the question paper.

- 1.1.1. A \_\_\_\_\_ post roof truss has two supporting beams placed on the tie beam. (1)
- A. King
  - B. Queen
  - C. Collar
  - D. Strut

- 1.1.2. The structural member shown is a \_\_\_\_\_.
- A. Tie
  - B. Tie beam
  - C. Rafter
  - D. Strut



- 1.1.3. The force shown in the picture is \_\_\_\_\_ (1)
- A. Torsion
  - B. Shear
  - C. Tension
  - D. Compression



- 1.1.4. The force shown in the picture is \_\_\_\_\_.
- A. Torsion
  - B. Shear
  - C. Tension
  - D. Compression

- 1.1.5. Structural failure happens when ... (1)
- A. Fracture
  - B. Bending
  - C. Toppling Over
  - D. All of the above

[5]

1.2. Indicate whether the following statements are **TRUE** or **FALSE**. If false, correct the statement.

1.2.1. A wedge is a single – inclined plane with two inclined planes facing each other.

\_\_\_\_\_

1.3.1 False ✓ a wedge is a double – inclined plane with two inclined planes facing each other. ✓

1.3.2 An idler gear synchronises the direction of movement of the driver and driven gear.

True ✓


1.3.3 The snail cam is a wheel with an axle that is off – centre.

False ✓ The eccentric cam is a wheel with an axle that is off - centre. ✓

(5)

1.4 Show the type of line that is used for the following:

1.4.1 Outlines  ✓

1.4.2 Hidden detail  ✓

1.4.3 Construction lines  ✓

1.4.4 Centre lines  ✓

(4)

1.5 Circle the correct term or word in the brackets to make the statement true.

1.5.1 An office punch is an example of a (**first** / second) class lever.

1.5.2 (**Reciprocating** / Linear) motion is a backward and forward motion.

1.5.3 A circular or turning motion is a (Linear / **Rotating**) motion.

1.5.4 (Worm / **Spur**) gear is the most common type of gear used in machines.

1.5.5 Acidic discharge occurs when (**metal** / wood) oxidises after being exposed to air or water.

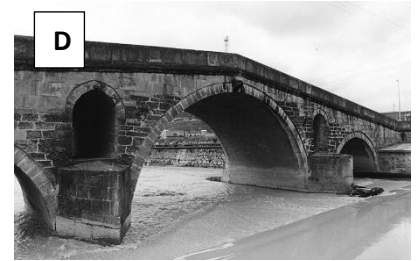
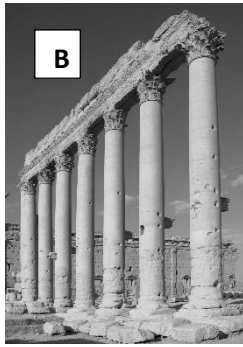
1.5.6 Cells or batteries deliver (alternating / **direct**) current.

(6)

## QUESTION 2: STRUCTURES

[20]

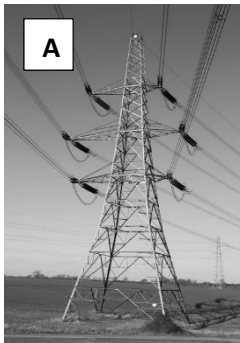
Study the images below and answer the questions that follow:



2.1 Refer to image A

2.1.1 Identify the structure shown in the image. (1)

**Electric pylon**



2.1.2 What is the purpose of this structure. (2)

**They are used to support power lines over a great distance.**

2.1.3 State the term used to ensure that the frame of this structure is more rigid when a force is applied. (1)

**Triangulation**

2.1.4 State the technique used to increase the load this structure can support. (1)

**Cross – bracing**

2.2 Refer to image B (5)

Fill in the missing word/ term in the sentence below:

Bridges are supported by **concrete** columns. Columns are **vertical** members that support a **load**. These **columns** add extra **support** to the bridges.

2.3 Refer to image C and D

2.3.1 Identify the structures shown in the images. (2)

**C – Suspension bridge**

**D – Arch bridge**

2.3.2 What is the purpose of each structure? (2)

**C – spans a large distance**

**D – supports a horizontal structure**

2.3.3 Why are cables used in image C? (1)

**Because they are lighter than beams or arches ✓**

**QUESTION 3: Processing [20]**

3.1 Define the following terms:

3.1.1 Biodegradable (1)

**A material broken down by air, water and bacteria to be absorbed by the Earth. ✓**

3.1.2 Renewable resources (1)

**An energy source that can re-grow or renew itself. ✓**

3.1.3 Froth Flotation (1)

**The process used to separate ink particles from waste paper. ✓**

3.2 Give TWO advantages of human – made products? (2)

- 1. often cheaper to produce ✓**
- 2. often need less maintenance ✓**
- 3. are often stronger ✓**

**(Any 2 = 1 mark each = 2 marks)**

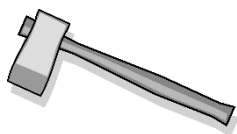
3.3 As a technology learner you have noticed that you fellow learners in the school are not practicing environment friendly safe methods in the school and their homes. Design a poster in the space below to make your fellow learners more aware of methods to practice more sustainable methods of living. (15)

Assessment rubric	Learner mark	Mark allocation
Proportion		3
Design includes sustainable ideas		4
Colour		3
Attractive design		3
Neatness		2

**QUESTION 4: Mechanical Systems and control [20]**

4.1 Identify the mechanical systems shown below: (3)

4.1.1



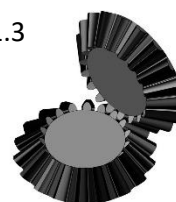
**4.1.1 wedge ✓**

4.1.2



**4.1.2 first class lever scissors ✓**

4.1.3



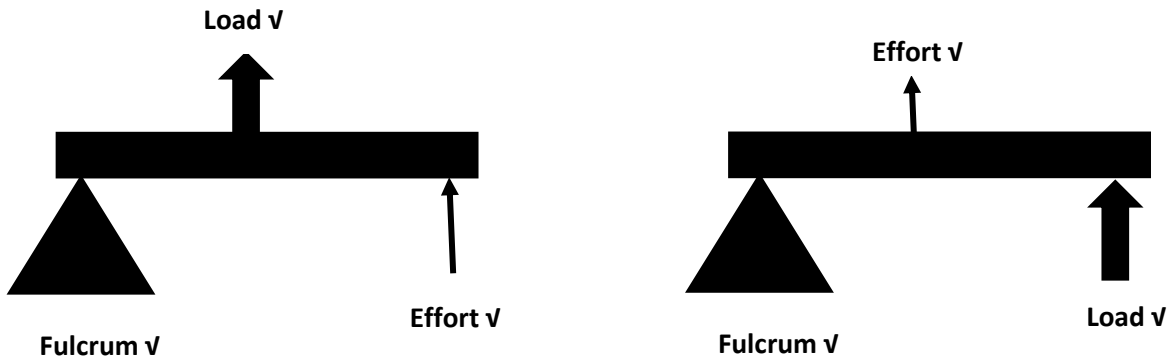
**4.1.3 bevel gear v**

4.2 Fill in the missing words in the sentence below:

(2)

A crank is a mechanism used to change **rotary v** motion into **reciprocating v** motion. E.g. Wind pumps

4.3 Use the planks below to show the difference between second – class levers and third – class levers. Label the diagrams. (6)



**\*NB the learners must have the labels with the different symbols to receive the mark.**

4.4 In a gear system the driver gear has 20 teeth with an input speed of 10 rpm. The driven gear has 40 teeth and the idler gear has 10 teeth.

4.4.1 What is the gear ratio?

(3)

$$\begin{aligned} \text{gear ratio} &= \text{no. of teeth on driven gear} / \text{no. of teeth on driver gear v} \\ &= 40 / 20 \text{ v} \\ &= 2:1 \text{ v} \end{aligned}$$

4.4.2 Calculate the output speed.

(3)

$$\begin{aligned} \text{Output speed} &= \text{input speed} / \text{gear ratio v} \\ &= 10\text{rpm} / 2 \text{ v} \\ &= 5\text{rpm} \text{ v} \end{aligned}$$

4.4.3 Calculate the velocity ratio of this gear system.

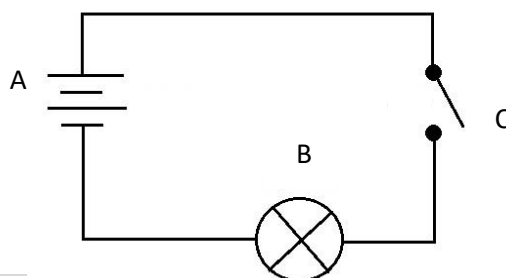
(3)

$$\begin{aligned} \text{Velocity ratio} &= \text{velocity of output gear} / \text{velocity of input gear v} \\ &= 5\text{rpm} / 10\text{rpm} \text{ v} \\ &= 1:2 \text{ v} \end{aligned}$$

**QUESTION 5: Electrical systems and control**

**[20]**

5.1 Study the circuit below and answer the questions that follow.



5.1.1 Name the electrical component shown A, B and C in the circuit above. (3)

**A – Cell / battery ✓**

**B – Bulb / lamp ✓**

**C – Switch ✓**

5.1.2 State whether they are input or output devices. (3)

**A – input ✓**

**B – input ✓**

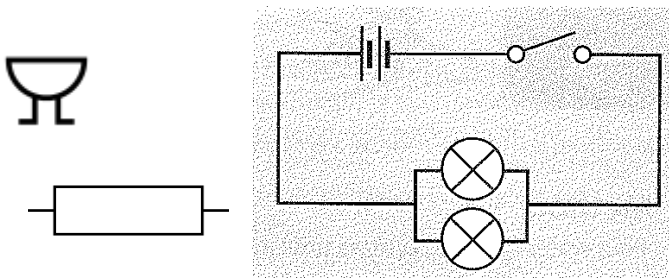
**C – output ✓**

5.1.3 Draw the following components: (2)

A. Buzzer

B. Resistor

5.1.4 Using the same symbols in the image above draw a circuit in parallel. The circuit must have all three symbols. Symbol B must be drawn TWICE. (4)



**1 mark for each symbol in the correct place = 4 marks**

5.2 Fill in the missing words in the sentence below: (4)

**Ohm's Law ✓** states if the **resistance ✓** of a conductor does not change, the **current ✓** that flows through the conductor is **proportional ✓** to the voltage.

5.3 Complete the truth table below for an OR logic gate. (4)

Input signal A	Input signal B	Output signal C
0	0 ✓	0
0 ✓	1	1
1	0	1 ✓
1	1	1 ✓

**QUESTION 6: Graphic Communication**

**[20]**

6.1 Look at the isometric drawing and redraw it in isometric projection to scale of 1:2 on the isometric grid paper provided. Include hidden detail.

Pay attention to the following:

- 1 mark is allocated to the correct drawing of each area
- ½ a mark is deducted for every neatness issue
- ½ a mark is deducted if the drawing is drawn the wrong way
- One square on this drawing is two squares on the isometric grid
- Position your drawing on the starting point indicated
- Colour in the THREE different views
- Print the title and scale in capital letters using guidelines of 5mm in height

