Name and Surname:_____ **Grade: 8** ____

Please indicate your Technology teacher?

Mrs. A. Stols		Mrs. J. Bega		Mrs. T. Tonkin	

Hillcrest High School

GRADE 8 - TECHNOLOGY EXAM

November 2020

TIME: 1 hour **TOTAL: 70 marks**

Examiner: Mrs A. Stols **Moderator: Mrs T. Tonkin**

QUESTION & ANSWER PAPER

NB: READ THE INTRUCTIONS

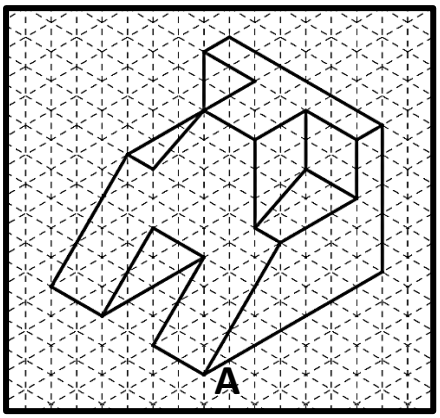
1. **This paper consists of pages 6, and 4 questions.**
2. **Ensure that you have answered all questions in this booklet.**
3. **Take note of the mark allocation in each question.**
4. **Write in a neat and clear handwriting.**

Question1	Question 2	Question 3	Question 4	Total	MODERATED MARK
/16	/27	/12	/15	/70	

DRAWING and STRUCTURES **/16**

QUESTION 1 **/12**

1,1) Look at the Isometric drawing and redraw it in Isometric projection to scale of 1:1 on the isometric grid paper provided.



Pay attention to the following.

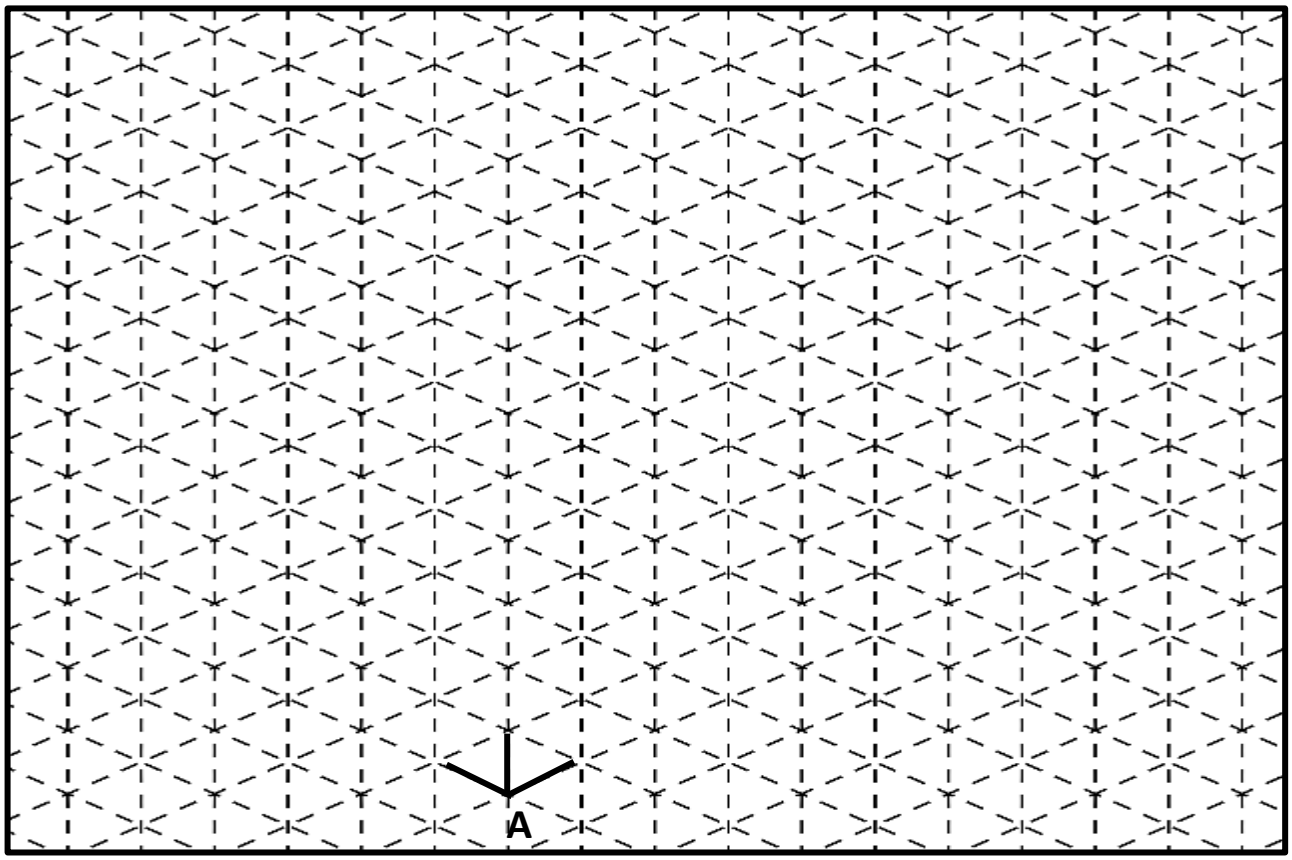
Correctness of drawing (2)

Neatness (3)

Drawing orientation (2)

Colour in the three different views (3)

Darken the outline of your drawing with a pen. (2)



1.2) Tick in the correct column to show whether the following are either man-made or natural and either shell, frame or solid structures; see the example. Fill in your answers in the table below. **/4**

	Man-made	Natural	Shell	Frame	Solid
Spiders Web					
Tortoise Shell					
Eifel Tower					
Dam Wall					

MECHANICAL SYSTEM **/27**

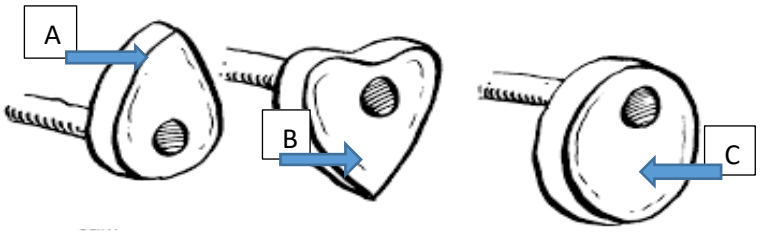
QUESTION 2 **/10**

2.1) In each question below choose the description from Column B that matches the term in Column A?

Colum A		COLUM B		Your answer
2.1.1)	Linkage	A) Wheel with teeth around its edge.	2.1.1)	
2.1.2)	Cam	B) Examples include: see-saw, a pair of pliers, scissors and a crowbar	2.1.2)	
2.1.3)	Spur gear	C) A mechanism made by connecting levers together.	2.1.3)	
2.1.4)	First-class levers	D) a gear used to change rotational movement through 90º	2.1.4)	
2.1.5)	Rack and Pinion	E) Shaped wheel or disc that is fixed to an axle.	2.1.5)	
2.1.6)	Second-class levers	F) The ratio of the speed of the driven gear relative to the speed of the driver gear	2.1.6)	
2.1.7)	Bevel Gear	G) a gear that changes rotational movement into linear movement	2.1.7)	
2.1.8)	Worm Gear	H) Held against the cam either by its own weight or by a spring.	2.1.8)	
2.1.9)	Gear Ratio	I) Examples include: nutcrackers, wheel barrow, bottle opener, trolleys used to carry boxes.	2.1.9)	
2.1.10)	Cam follower	J) This type of gear can deliver a very strong turning force.	2.1.10)	

2.2) **CAMS** **/9**

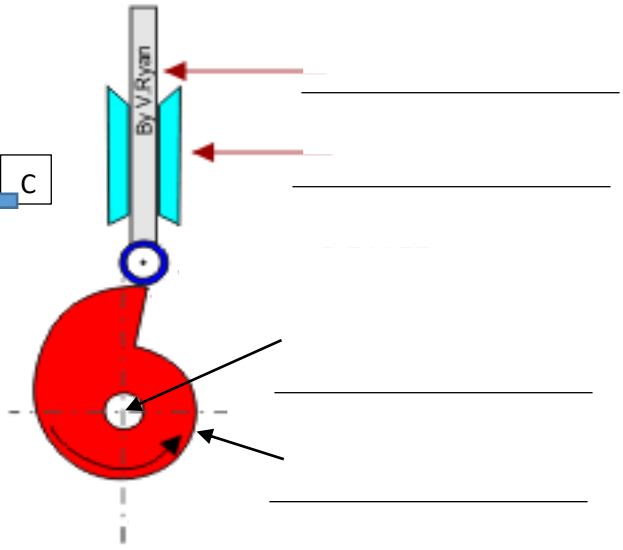
2.2.1) Identify the following type of cams? **/3**



A _____

B _____

C _____



2.2.2) Please refer to the above right picture and answer the following questions **/6**

2.2.2.1) What type of cam is shown? _____ **/2**

2.2.2.2) Label the different parts of the cam? **/4**

2.3) **LEVERS** **/8**

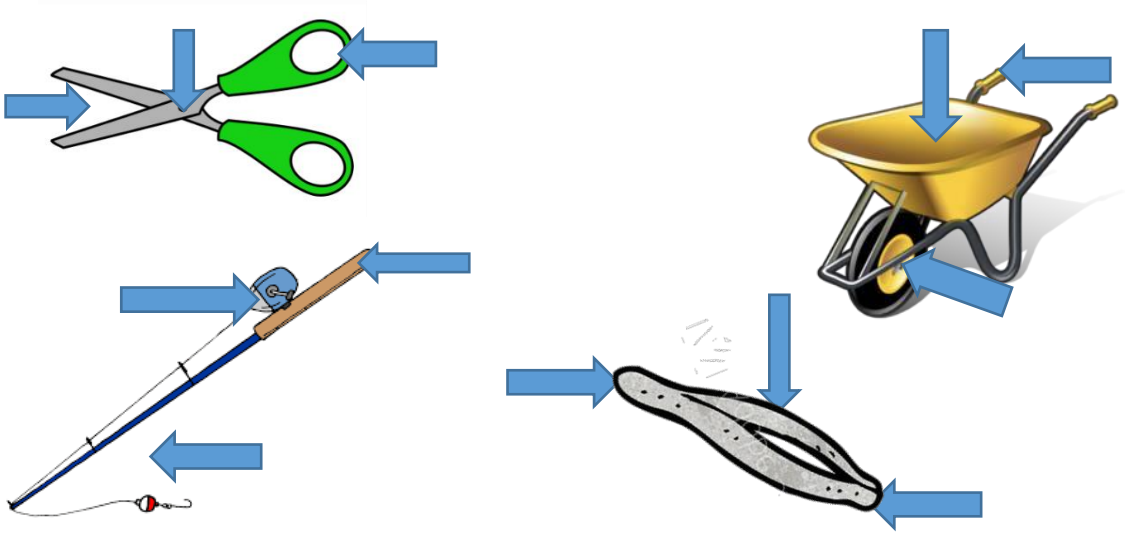
2.3.1) Write out the definition of a third-class lever. **/2**

_____

_____

_____

2.3.2) Label on the sketches the effort, fulcrum and load? **/6**



CALCULATIONS **/12**

QUESTION 3 **/6**

3.1) Find the missing value in the question below to make the lever balance?

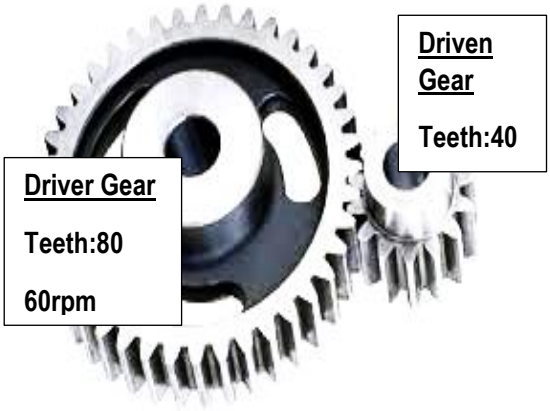
LEVER CALCULATION

A= 9N B= 45N

a= 30m △ b= ?

GEAR CALCULATIONS /6

3.2)



3.2.1) The **driver** gear has **80 teeth,** and the **driven** gear has **40 teeth**. Calculated the gear ratio using the formula.

3.2.2) If the **driver gear revolves at 60rpm**, what is the driven gear's speed?

Calculate the **output speed (rpm)** of the driven gear.

3.2.1)	3.2.2)
	

ACID MINE DAMAGE CASE STUDY /15

QUESTION 4

The impact on the environment of acid mine water

In many places where mining take place, the mine shafts are very deep. When shafts are sunk below the water table, water must constantly be pumped out of the mine in order to prevent flooding. Sometimes, when the mine is abandoned, the pumping stops, and groundwater floods the mine. Some metal mines may generate highly acidic discharges Acidic discharges occurs when metal oxidises after being exposed to air and water. Colonies of bacteria speed up the decomposition of metal and causes more acidity. After acid water may eventually flow out of the mine and pollute the surrounding environment. Farmers near a mine fear for their livelihoods because their environment has become toxic. As

the region's mines have closed or been abandoned, they have left behind acidity and potentially radioactive mine water to rise to the surface, contaminating waterways. The acid mine water is causing serious problems. The farmers have to use bottled water because they don't trust the water coming from their boreholes. They have to replace their geyser elements every three to six months because of the acid mine water corrodes (breaking down the metals that come in contact with water) them. The borehole water is so corrosive that it eats through their pipes. The farmers noticed that livestock have been affected by drinking the water. Many animals lose their babies before birth or give birth to the deformed young.

Compile a report by considering the following questions:

4.1) In your own opinion define what acid mine water is? /3

_____
_____
_____

4.2) What causes acid mine water? /3

_____
_____

4.3) Do all mines produce acid water? /2

_____
_____

4.4) Describes how the acid water leaks out of the mine? /3

_____
_____
_____

4.5) What is the effect of acid water on human's animals and plants? /4

_____
_____
_____