HILLCREST HIGH SCHOOL

TECHNOLOGY

FINAL EXAMINATION - 2018

GRADE 9

TOTAL: 120 **TIME: 2 HOURS**

EXAMINER: MR N MILLER **MODERATOR: MRS T TONKIN**

NAME/SURNAME: _____ **GRADE 9 ____**

SUBJECT EDUCATOR: BEGA/MILLER/NAIDOO/TONKIN

INSTRUCTIONS

1. **The question paper consists of 7 questions and 11 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.**

QI	Q2	Q3	Q4	Q5	Q6	Q7	TOTAL	MODERATED MARK
20	10	15	20	21	20	14	120	

SECTION A - **DESIGN SKILLS, STRUCTURES AND FORCES**

QUESTION 1 [20]

Multiple Choice. Highlight your choice of answer by circling the appropriate answer.

1.1 Which views appear in a First Angle Orthographic Projection drawing?

A. Front, bottom and right views.

B. Isometric views.

C. Front, top and left views

1.2 An isometric drawing shows a _____ projection.

A. three sided

B. two sided

C. one sided

1.3 It is important to use correct line types when drawing. Which line type is incorrect?

A. Visible outline

B. Hidden detail line

C. Fishing line

1.4 Which basic drawing instrument is not used when drawing?

A. 30˚x 60˚set square

B. Ball point pen

C. Compass

1.5 When drawing to a scale of 1:2 it means:

A. The drawing is 2 times bigger

B. The drawing is half the size

C. The drawing is drawn twice

1.6 A bird's nest can be described as a _____ structure.

A. Natural

B. Solid

C. Man made

1.7 An egg box can be described as a _____ structure

A. Natural

B. Man made

C. Solid

1.8 What type of structure would we need for a person in a wheelchair to reach a level of 1 metre?

A. Steps

B. Lift

C. Ramp

1.9 Static forces are forces that _____

A. Move from left to right

B. Move up and down

C. do not move at all

1.10 An example of a dynamic force is _____

A. books on a bookshelf

B. Joshua jumping on his bunkbed

C. Joshua fast asleep on his bunkbed

1.11 Which is an even load?

A. Lwazi carrying his school bag with his left hand.

B. Lwazi carrying his bag with his right shoulder.

C. Lawzi carrying his and Kendra's bag with each hand.

1.12 an example of a tension force is _____

A. The twisting of a body.

B. A body sitting on s chair.

C. Being stretched to a stiffness.

1.13 An example of a shear force is _____

A. A boy lifting heavy weights.

B. A girl sitting on a chair.

C. Scissors cutting pieces of paper.

1.14 An example of compression force is _____

A. Bent out of shape

B. Pushed or squashed

C. Pulled tight and stretched out.

1.15 The amount of material in an object is known as _____

A. Size

B. Mass

C. Weight

1.16 The gravitational force acting on an object is _____

A. Density

B. Mass

C. Weight

1.17 The relative hardness of an object is known as _____

A. Weight

B. Mass

C. Density

1.18 The ability to exist for a long time without much deterioration is known as _____

A. Durability

B. Ductility

C. Flexibility

1.19 The capability of metals to be drawn into wire _____

A. Ductility

B. Flexibility

C. Durability

1.20 The wearing away of metal, stone and other material due to oxidization.

A. Rotting

B. Chipping

C. Corrosion (20)

SECTION B - MECHANICAL SYSTEMS AND CONTROL

QUESTION 2 [10]

True or False

2.1 Pascal's principle states that when we apply pressure anywhere to a fluid in a closed container, the force is transmitted equally in all directions. _____

2.2 A hydraulic system uses compressed air in two cylinders linked by a tube. _____

2.3 Newton (N) is the unit that measures force._____

2.4 A pneumatic system uses compressed fluid in two cylinders linked by a tube. _____

2.5 A single wheel fixed pulley system has one wheel fixed to a beam. _____

2.6 In a block and tackle system a combination of a fixed and a moveable pulley makes it easier for us to lift heavier objects. _____

2.7 Bevelled gears are gears with 45˚teeth cut in a spiral along the shaft. _____

2.8 Worm gears are gears with 45˚ sides with teeth cut around them. _____

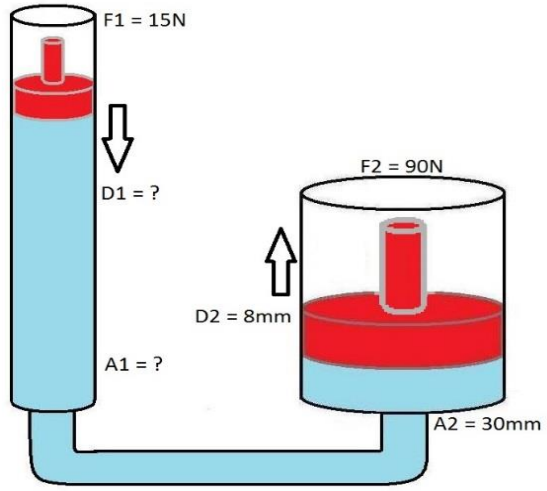
2.9 A rack and pinion gear system is used to open automatic entrance gates. _____

2.10 A system in which two or more gears engage is called a gear system. _____

(10)

QUESTION 3 [15]

Calculate the missing values in the following hydraulic system.



3.1 MA = ----------

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(3)

3.2 AI (Effort) = ----------

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(3)

3.2 D1(Effort) = ----------

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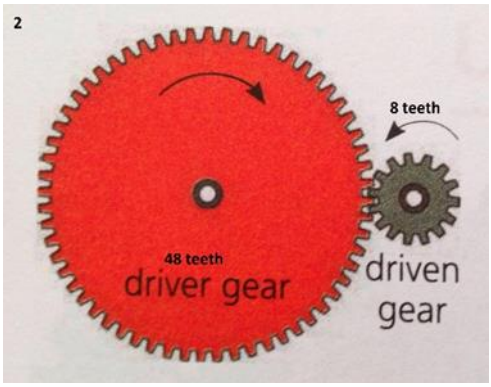
(3)

3.3 Calculate the Velocity Ratio of the following gear systems.



3.3.1 VR = ----------

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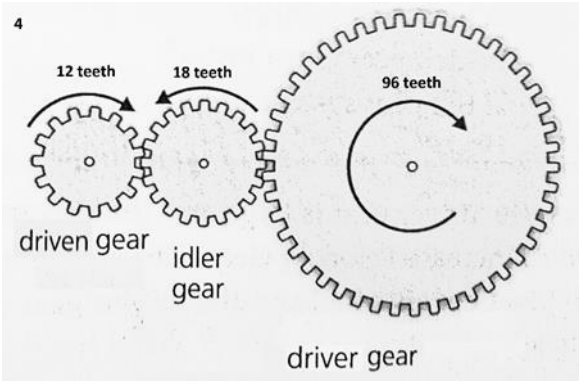
(3)



3.3.2 VR = ----------

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(3)

<u>SECTION C -</u> ELECTRICAL SYSTEMS AND CONTROL

QUESTION 4 [20]

In term 3 we built a dark sensor circuit device using a range of electronic components.

Calculate the following:

Volts (V) = I(amps) x R(ohms)
V = I x Ω

4.1 The voltage if the battery used to build the light sensor if the ammeter reading is 3 ohms. (3)

4.2 Calculate the current in the circuit control we built which has a resistance of 3 ohms. (3)

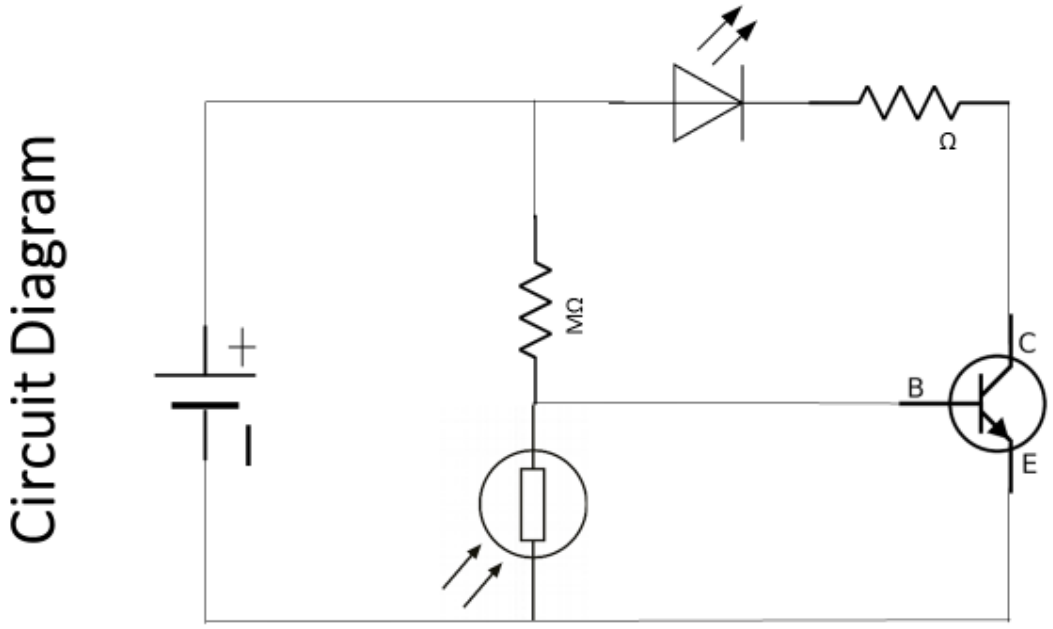
4.3 Fully label the components on the circuit diagram of the dark sensor device

used in the image below. (6)

Include the two missing ohms (Ω) readings on the components. (2)

4.4 What does the following refer to?

B: _____ C: _____ E: _____ (6)



(20)

SECTION D - PRESERVATION OF MATERIALS

QUESTION 5 [21]

5.1 Explain the following processes of preserving food.

5.1.1 Pickling (2)

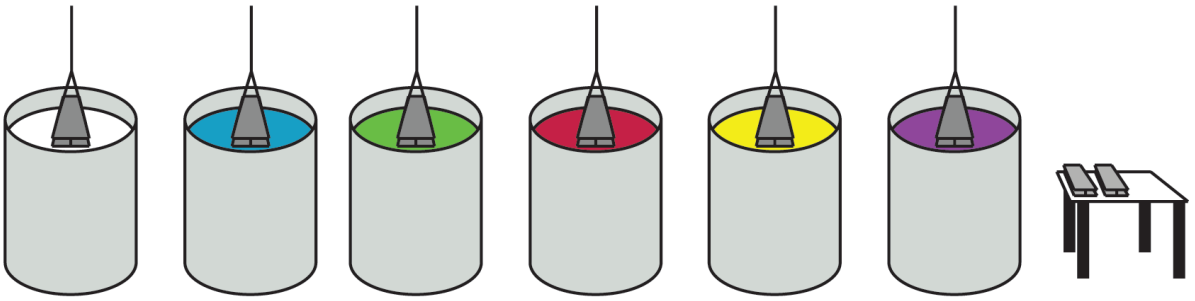
5.1.2 Drying (2)

5.1.3 Salting (2)

5.2 Study the numbered steps below. They give the process of painting metals, but the steps in the process are not in the correct order. Write down the numbers of the steps in the order that they should be done. (6)

A	PROCESS OF PAINTING METALS	B
1.	Double coat with primer. Primer helps the top coat of paint to stick to the surface.	
2.	Sand down your metal. Scrape or sand the surface of your metal.	
3.	Apply a zinc-chromate primer if you are working with rusted metal.	
4.	Clean off all loose paint, dirt, grease and grime from the surface of your model.	
5.	Paint. Acrylic latex paint is usually the best paint to use for metal.	
6.	Read the labels. Make sure your primer and your coat of paint are compatible.	

5.3 There are 7 steps used in the hot-dip galvanising process. Number the 7 steps in their correct order from the words below. (7)



1. 2. 3. 4. 5. 6. 7.

Caustic cleaning	Pickling	Rinsing	Flux solution	Rinsing	Inspection	Zinc bath cooling

5.4 Metals can be divided into two main groups. Name them. (2)

5.4.1 _____ 5.4.2 _____

PLASTICS

QUESTION 6 [20]

Reducing, reusing and recycling of plastics is essential to help to conserve our environment.

What can you do to:

6.1 Reduce the use of plastic:

6.2 Reuse plastic:

6.3 Recycle plastic:

--- (6)

6.4 **Case study – Extending the life of a landfill site**

Adapted from The Mercury Wednesday 29 July 2009. Read the following case study and answer the questions that follow.

A unique partnership between a recycling business and the eThekweni Municipality to minimise the tons of waste dumped in landfill sites in and around Durban every day could extend the lifespan of Mariannhill landfill site by 20 – 25 years.

Durban Solid Waste has established a materials recovery facility at the Mariannhill site which now processes more than 200 tons of recyclable waste daily. They have established a system whereby waste is reused, redesigned or re-engineered. The scheme is to be rolled out to other landfill sites as well. The challenge is to get communities excited and start them recycling at their homes and businesses. For every 10 tons of garbage that goes through the site, a job is created. Currently 150 local people have been employed at the site. On arrival at the site, a recycling ambassador meets each vehicle with information on where to dispose of the waste and what is considered recyclable and what is not. No fee is charged for any recyclables. Garden waste is shredded and turned into compost. In future, it is hoped that for every bag of garden waste, a bag of compost will be exchanged. Methane gas is extracted from the site for the generation of electricity. The landfill site has been changed from a stinking wasteland to a rehabilitated area of grass, plants and birds. A 'green ambulance' rescues plants from construction sites and plants them here. A nursery is also being established.

6.4.1 What partnership has been established? (2)

6.42 How is the amount of waste minimised? (3)

6.4.3 How does this scheme provide employment for the community? (2)

6.4.4 What is the function of a recycling ambassador? (2)

6.4.5 Where does the compost come from? (2)

6.4.6 What is methane gas? (3)

GRAPHIC COMMUNICATION

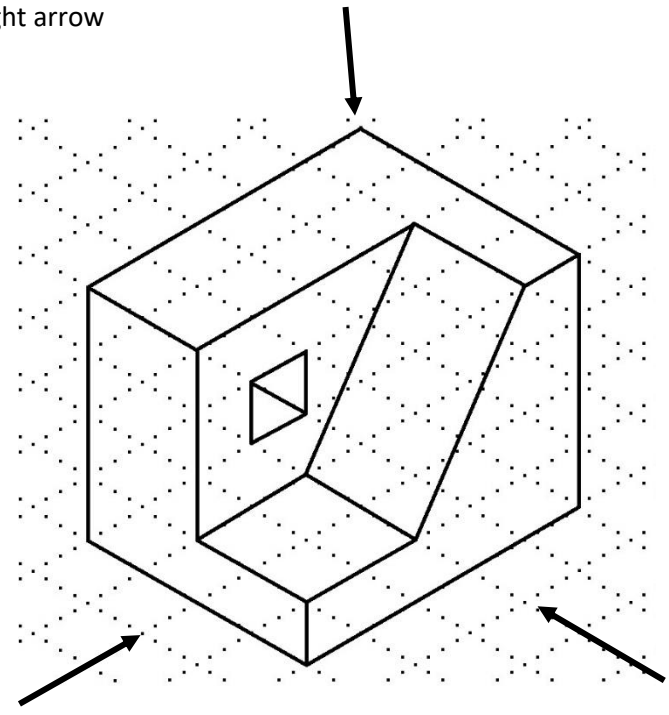
QUESTION 7 [14]

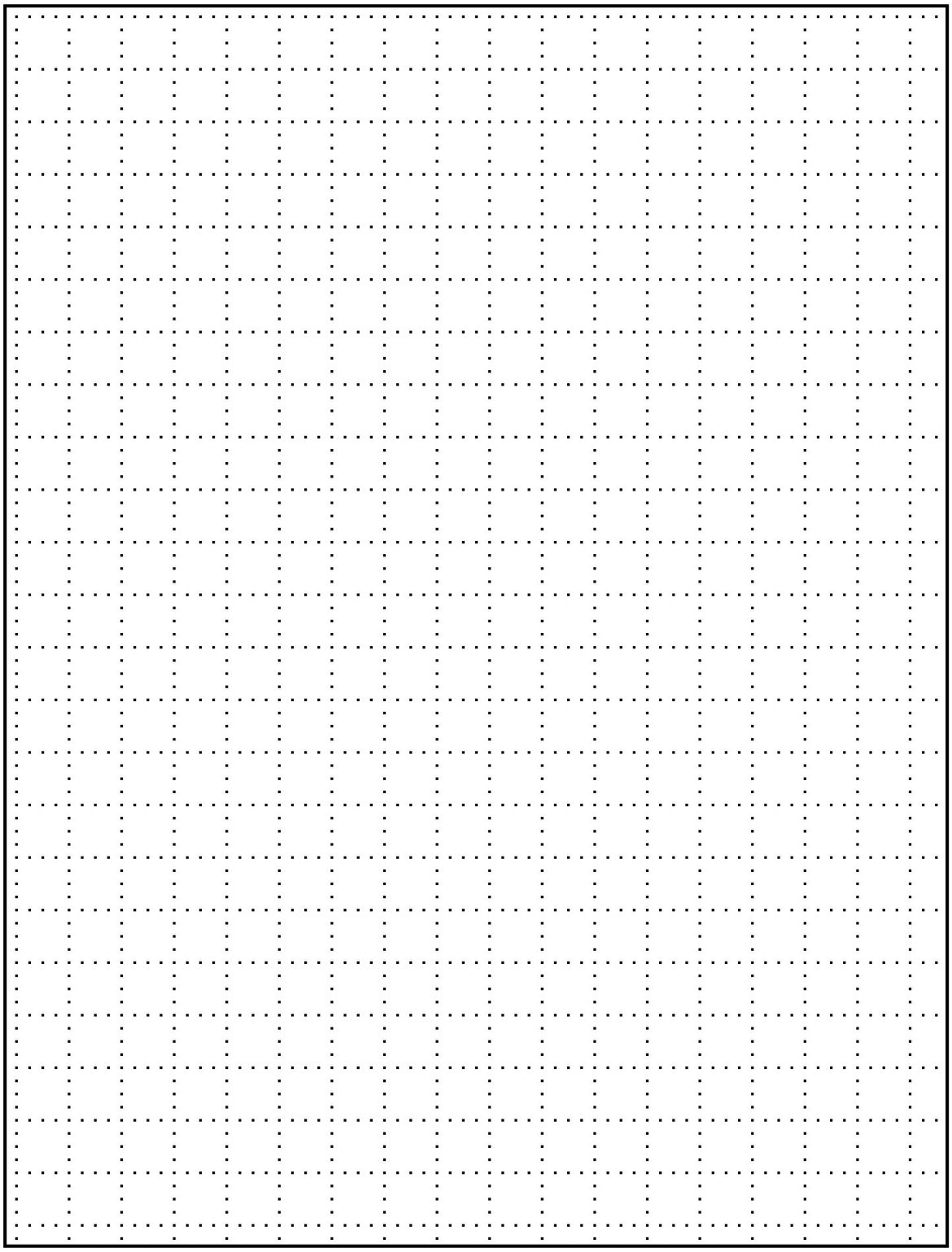
Draw the following views of the model in 1st Angle Orthographic Projection:

7.1 A Front view from the right arrow

7.2 Top view, and

7.3 Left view





Orthographic grid