

Name: _____ **Grade 9** .

AS	JB	TT	TOTAL (70)	%

Hillcrest High School

GRADE 9 - TECHNOLOGY EXAM

November 2020



TIME: 1 hour

TOTAL: 70 marks

Examiner: Mrs Tonkin

Moderator: Mrs Stols

QUESTION & ANSWER PAPER

NB: READ THE INSTRUCTIONS

1. This paper consists of 6 pages, 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.

Question 1

Drawing

[10]

1.1. Draw the lines in the spaces provided below:

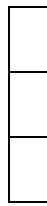
(2)

Outline

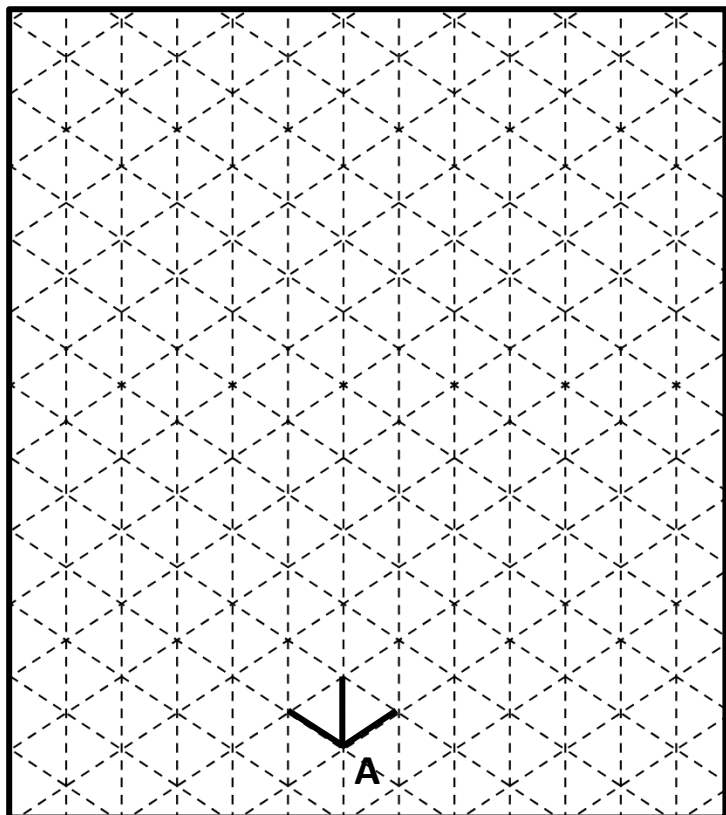
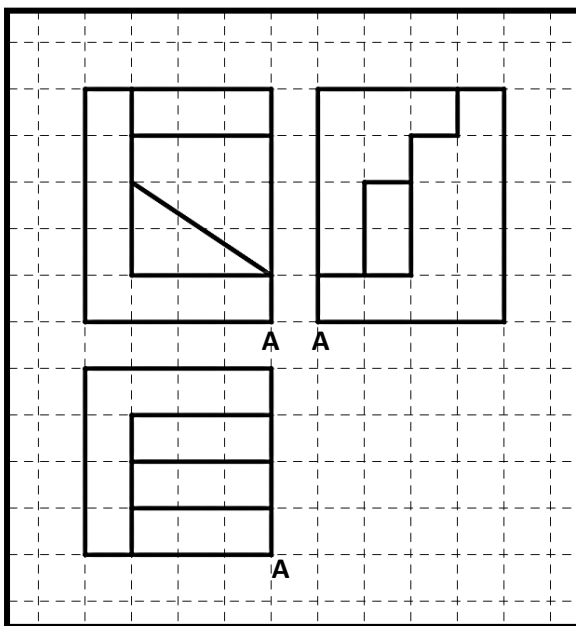
Hidden Detail

Centre Line

Construction line



1.2. The given figure shows the front, top and the right view of a model. Draw an isometric view of the model. Make point A the lowest point. Point A has been given for you on the isometric grid. Draw in **pencil** first then outline the final answer in pen. Colour in the 3 different views in different colours. (8)



Question 2

Electricity

[27]

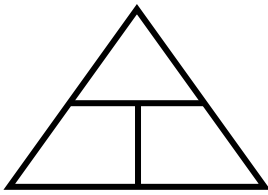
2.1. Draw a circuit in the space provided. The circuit must include the following: 3 cells in series, 1 switch, 1 LED, 2 resistors (only resistors to be connected in parallel). (5)

- 2.2. Logic Gates: When you open a car door the inside light comes on. Complete the Logic Gate (Truth table) below to show the relationship between the light and the car doors. (3)

Driver Door	Passenger Door	Inside Car Light
		0
1		1
0	1	
		1

- 2.3. The TYPE of circuit above is an _____. (1)

- 2.4. Fill in the triangle and table provided, all relating to Ohm's Law. (4)



Letter	Name	Measured in
V	Voltage	
		Ohm
	Current	

- 2.5. Using Ohm's Law calculate the following: (Show all calculations) (4)

- 2.5.1. Current = 0,03; Resistance = 300; Calculate the Voltage.

- 2.5.2. Voltage = 4,5; Resistance = 100; Calculate the Current.

- 2.6.1. Explain what happens when cells are connected in series. (2)

- 2.6.2. Explain what happens when cells are connected in parallel. (2)

- 2.7. What is the resistance and the tolerance of the following resistors? You may use the table alongside to help, if you'd like. Please note that the table is **NOT** for marks. (3x2=6)

A) Red, blue, grey, silver _____

B) Violet, black, orange _____

C) Green, white, gold, red _____

Colour	Digit	Tolerance
	0	
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	

Question 3 Mechanical Systems

[20]

3.1. State Pascal's Principal:

(1)

3.2. A hydraulic press has an input radius of 3mm. It is linked to an output piston that is four times the size. The pressure within the system is 20N/mm². Round off to 2 decimal places.

Answer the following questions:

(8)

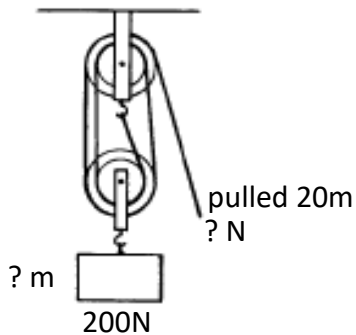
A) Calculate the Input Area

B) Calculate the Output Area

C) Calculate the Mechanical Advantage

D) Calculate the Output Force

3.3. Look carefully at the pulley diagram below and answer the following questions. (5)



3.3. A) What is the number of falls?

3.3. B) The load is 200N. Calculate the effort.

3.3. C) The Effort is pulled 20metres, how far will the load have moved?

3.4. Draw the different types of cleats into the spaces provided.

(3)

Cam Cleat	Jam Cleat	Clam Cleat
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3.5. Explain what cleats are used for. Give two examples of where any one of the cleats is used.

(3)

Question 4

Case study – Moulding recycled plastic pellets into products [13]

There are three methods of using pellets to make plastic products: extrusion moulding, injection moulding and blow moulding. Injection moulding is used to make products such as food tubs, yogurt containers, car panels, computer monitors and bottle caps.

Methods of moulding plastic pellets

Extrusion moulding is a continuous process that is used to make products such as rods, tubes, pipes, electrical wire, and thin films such as food wrappers.

- The plastic pellets are loaded into a hopper, which has a long, heated chamber and a continuous rotating screw.
- The plastic is melted and then forced through a small opening, known as a die, to form the desired shape.
- The plastic is fed onto a conveyor belt, onto rollers, or into a water tank to cool. The cooled product can be cut into the desired shape or length.

Blow moulding is used to make products such as cool drink bottles and milk jugs. It is used in combination with the extrusion or injection moulding process. The blow moulding process allows a hollow plastic product to be made without having to mould two or more parts together to form the finished product.

Methods of processing plastic pellets

The processing method that is used to convert the plastic pellets into finished products is determined by the type of product that is being produced. There are many types of processes the pellets could go through to become new products. Different plastic products are manufactured from recycled plastics.

Recovered plastics recycled into products

PET plastics are recycled into products such as:

- Fibre for polyester carpet, fabric for T-Shirts, filling for winter jackets
- Plastic 'wood'



LDPE plastics are recycled into products such as:

- Irrigation hoses



HDPE plastics are recycled into products such as:

- Refuse bins, refuse bags and shopping bags
- Garden furniture



LDPE plastics are recycled into products such as:

- Bottles, buckets and ropes



PVC plastics are recycled into products such as:

- Shoe soles and doormats



PS plastics are recycled into products such as:

- Picture frames and seeding trays



4.1. What are the different methods in which pellets can be used to make plastic products? (3)

4.2. Draw an accurate Systems Diagram explaining the Extrusion moulding process. (4)

Input	Process	Output

4.3. Describe why recycling as much plastic as possible would benefit society as a whole. (3)

4.4. Choose three types of recycled plastic and list two products made from each plastic. (3)

Type of Plastic: _____
 Product 1: _____
 Product 2: _____

Type of Plastic: _____
 Product 1: _____
 Product 2: _____

Type of Plastic: _____
 Product 1: _____
 Product 2: _____