Hillcrest High School

Grade 9

TECHNOLOGY

JUNE 2025

MARKS: 100 **EXAMINERS:** Mrs L. Gordon& Mrs A. Stols

TIME: 1 hour 30 minutes **MODERATOR:** Mrs T. Tonkin

INSTRUCTIONS

1. The question paper consists of 6 questions and 5 pages including the cover page.
2. Part of Question 6 and the Computer Literacy questions are attached to your answer booklet.
3. Write your name and grade clearly and neatly in the space provided on the answer sheet.
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 [30]

1.1. Multiple choice. Choose the correct answer and write only the letter A - D next to the number. (10)

1.1.1. Density of a material is
- A the amount of air in a substance
- B the amount of sand in cm squared
- C the amount of matter in a teaspoon
- D the amount of matter in grams that fills a particular space

1.1.2. The mass of material is
- A a measurement of the level of density of a material
- B a measurement of the level of strength of a material
- C a measurement of the level of water in a beaker
- D a measurement of the level of matter in a material

1.1.3. The hardness of material
- A the ability of a material to flex under pressure
- B the ability of a material to contain natural materials
- C the ability of a material to corrode
- D is the ability of a material to resist scratches, wear and tear

1.1.4. The stiffness of a material
- A the ability of a material to bend and return to its original shape
- B the ability of a material to absorb water
- C the ability of a material not to bend under pressure
- D the ability of a material stretch

1.1.5. Flexibility is the ability
- A of material to bend and return to its shape
- B of material not to bend under pressure
- C of material to react with sand
- D of material to withstand being scratched

1.1.6. Corrosion is
- A reaction between metal and sand
- B a reaction between glass and water
- C a reaction between zinc and air
- D a reaction between metal and gases

1.1.7. Durability is the
- A ability of a material to break
- B ability of a material to resist being painted
- C ability of material to stand up to wear and tear
- D ability of material to bend

1.1.8. Resistant is the
- A ability of a material not to be affected by events like fire, earthquakes
- B ability of a material to break easily in an earthquake
- C ability of a material to not get wet
- D ability of a material to not dry out

1.1.9. The Eiffel Tower was made from
- A carbon composites
- B wrought iron
- C bricks
- D clay

1.1.10. To stop corrosion on metal you can
- A paint the material
- B varnish the material
- C dip the metal in zinc
- D all the above

1.2. Match the columns, choose a description from Column B that matches a word in Column A. Write only the number and letter. (10)

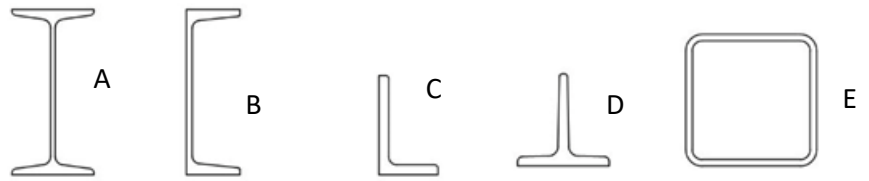
COLUMN A		COLUMN B	
1.2.1.	Forces	A	A balanced load
1.2.2.	Uneven loads	B	A twisting force
1.2.3.	Dynamic forces	C	A stretching force
1.2.4.	Even loads	D	Forces that act across a distance
1.2.5.	Static forces	E	A pull or a push action on an object
1.2.6.	Contact forces	F	Two equal and opposite forces that squash a structure
1.2.7.	Non-contact forces	G	Loads that are not balanced
1.2.8.	Tension	H	Forces that come into direct contact with an object
1.2.9.	Compression	I	A force acting on a structure that does not move
1.2.10.	Torsion	J	A moving force on a structure.

1.3. True or False. State whether the following statements are true or false. Write true (T) or false (F) next to the number in your answer book. (10)

1.3.1. Hydraulics is the use of fluid in a system to do work
1.3.2. A one-way valve does not allow the movement of fluid in both directions.
1.3.3. A compressor is a machine that pumps and stores air.
1.3.4. Pneumatics is the use of water to do work
1.3.5. A pulley is a wheel with a groove
1.3.6. Pressure is the amount of force that is applied over the surface area of an object
1.3.7. Hydraulics is an open system
1.3.8. Pneumatics is a closed system.
1.3.9. Cars do not use a hydraulic braking system.
1.3.10. A single fixed pulley does not produce mechanical advantage.

QUESTION 2 BEAM STRUCTURES **[5]**

Name the different cross sections of the beams below:



QUESTION 3 HYDRAULICS [15]

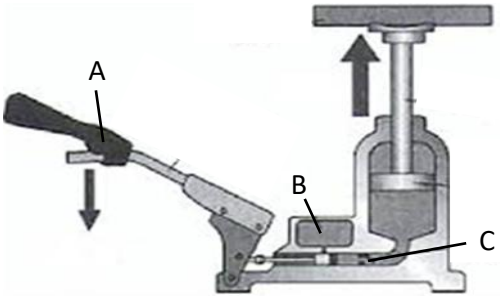
3.1. A hydraulic lift system has an input piston of $5m^2$ and an output piston which has an area of $20m^2$. The load being lifted is 1000N.

3.1.1. Calculate the pressure of the system (3)

3.1.2. What input force is needed to lift the load (2)

3.2. A load of 15 000N is lifted with a force of 3 000N by a hydraulic jack what is the mechanical advantage of this system. Show your working. (2)

3.3. Label the hydraulic car jack shown below: (3)



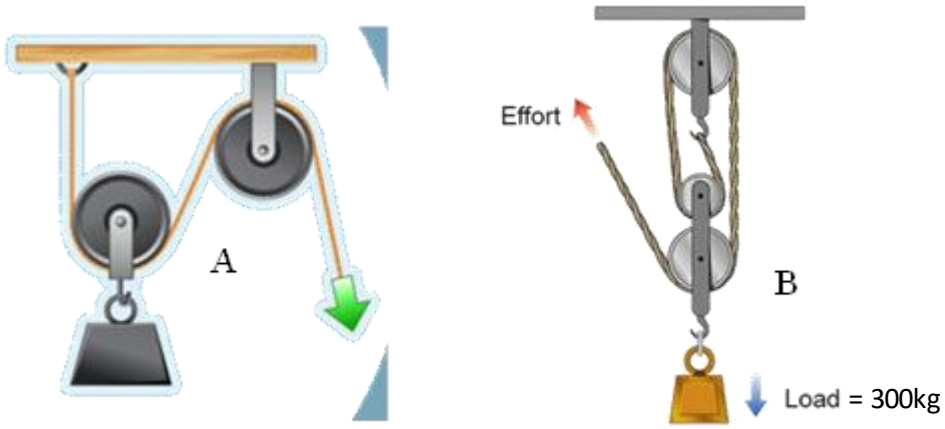
3.4. Write down three different examples of where hydraulic systems are used (3)

3.5. Write down one advantage and one disadvantage of hydraulic systems. (2)

QUESTION 4 PULLEY AND CLEAT SYSTEMS [20]

4.1. Fill in the missing words. A pulley is…**a)** … with a groove in it so that a ...**b)**…or cable can move in the groove. Pulleys are used to change the…...**c)** ….of the ….**d)**. (4)

4.2. Look at the pulleys below and answer the following questions:

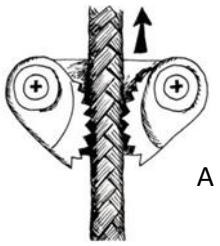


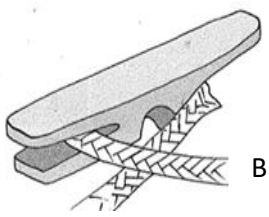
4.2.1. Name the pulleys (A and B) (2)

4.2.2. Which pulley system shown below will give you more mechanical advantage? (A or B). Explain. (2)

4.2.3. Calculate the effort required to lift a load of 300kg for pulley system B. (2)

4.3. 4.3.1. Name these three devices (3)


A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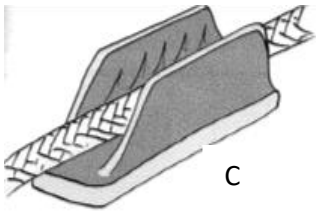
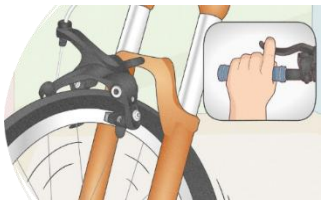

C

4.3.2. What do these devices do? (What is their function?) (2)

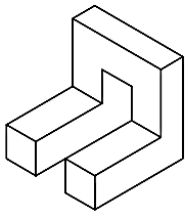
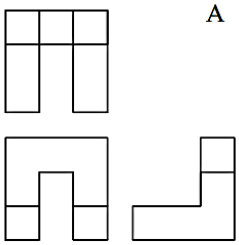
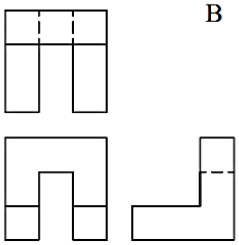
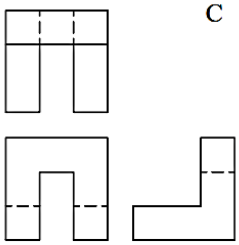
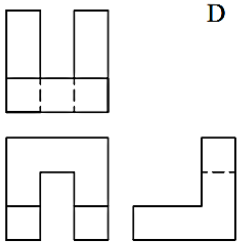
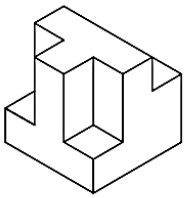
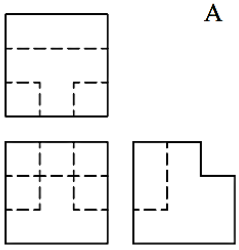
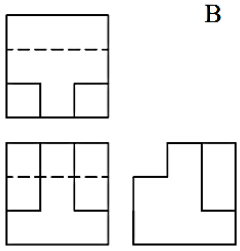
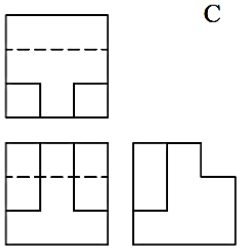
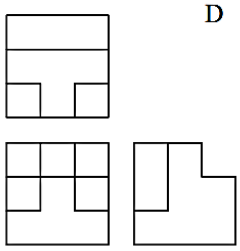
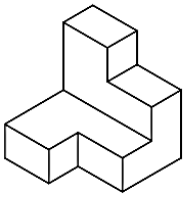
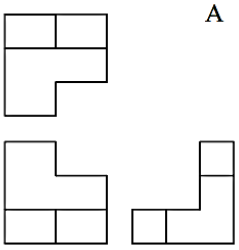
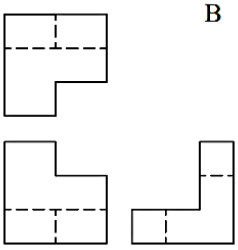
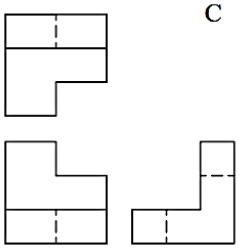
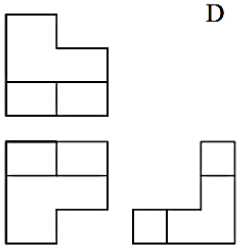
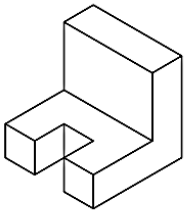
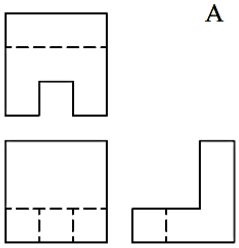
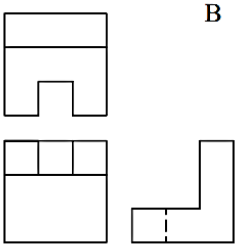
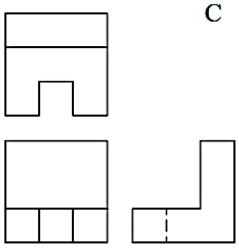
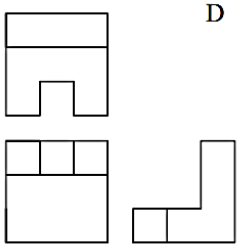
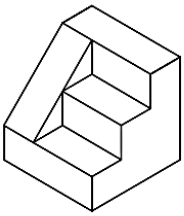
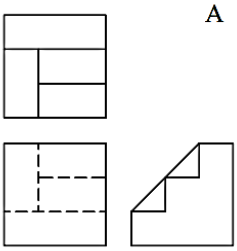
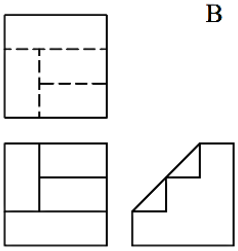
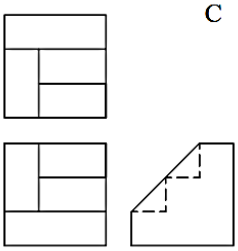
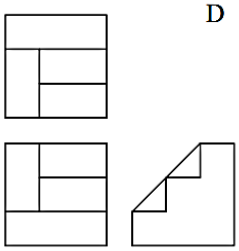
4.3.3. Give an example of where they could be used. (1)

4.4. Alongside is a picture of a bicycle braking system. Draw a simple flow diagram to describe how a bicycle braking system works. (4)



QUESTION 5 DRAWING **[10]**

Look at the isometric drawings provided. Select the correct third-angle orthographic drawing of that model, write the number and the letter only. (5 x 2 marks each)

5.1. 	A 	B 	C 	D 
5.2. 	A 	B 	C 	D 
5.3. 	A 	B 	C 	D 
5.4. 	A 	B 	C 	D 
5.5. 	A 	B 	C 	D 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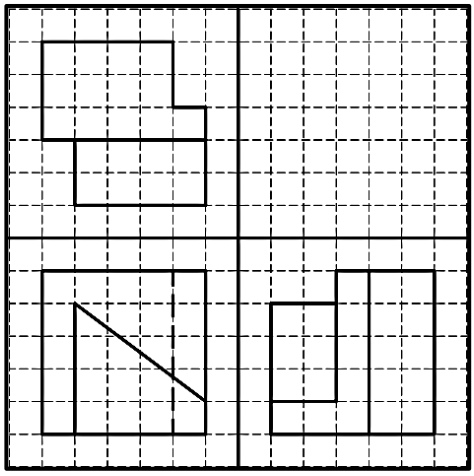
NAME: _____ **GRADE 9** _____

SUBJECT EDUCATOR: GORDON/STOLS/MAGUBANE

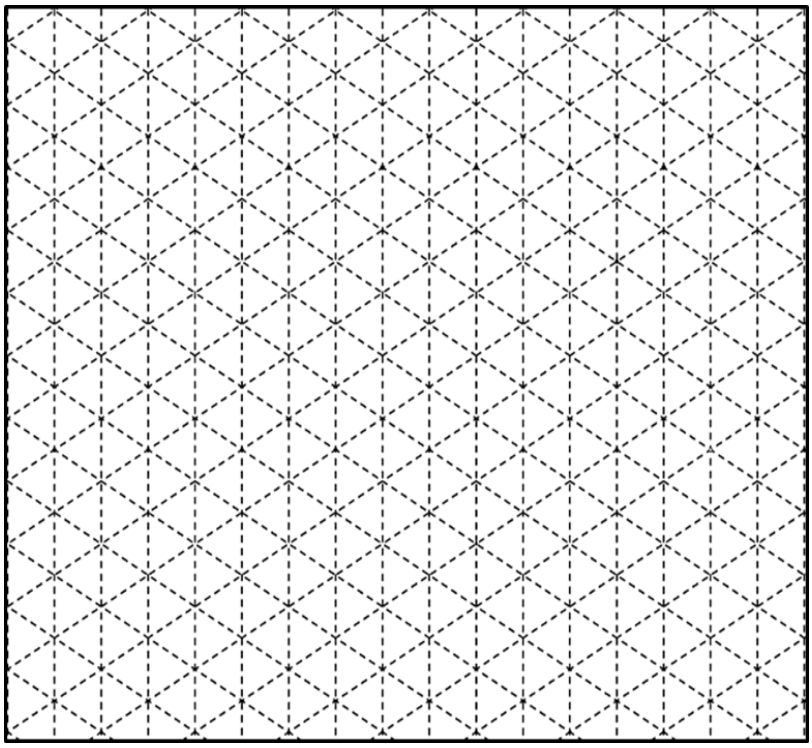
Q1 30	Q2 5	Q3 15	Q4 20	Q5 10	Q6 20	TOTAL 100

QUESTION 6 **DRAWING** **[20]**

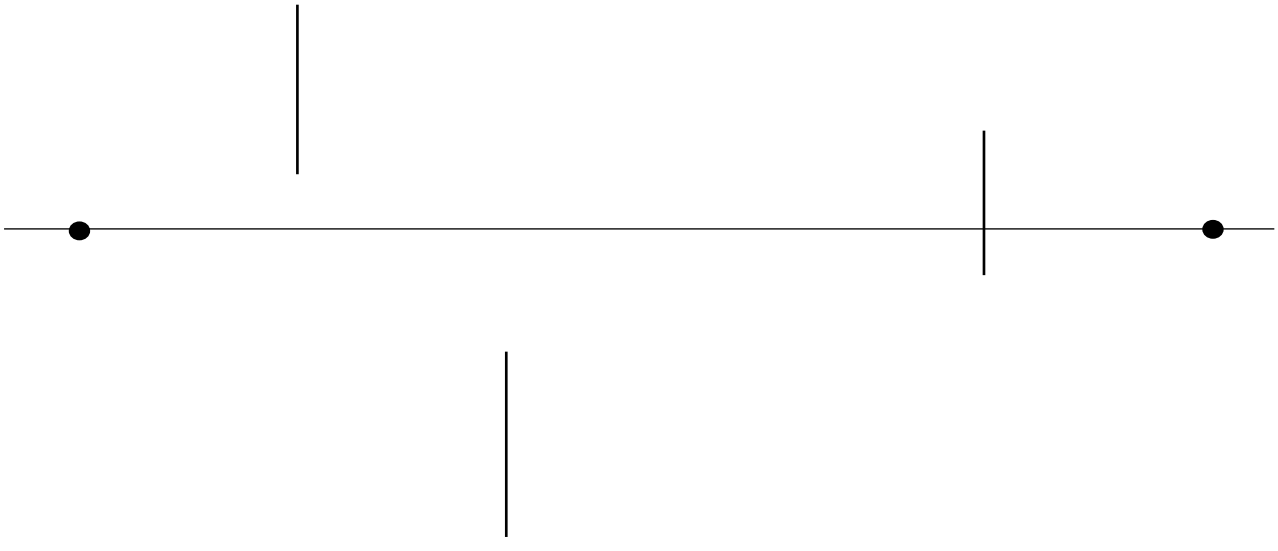
6.1. Convert the third angle orthographic projection of a block into an isometric drawing. Colour in the different sides in different colours. (12)



RUBRIC		
Lines	9	
Colour	3	
TOTAL	**12**	

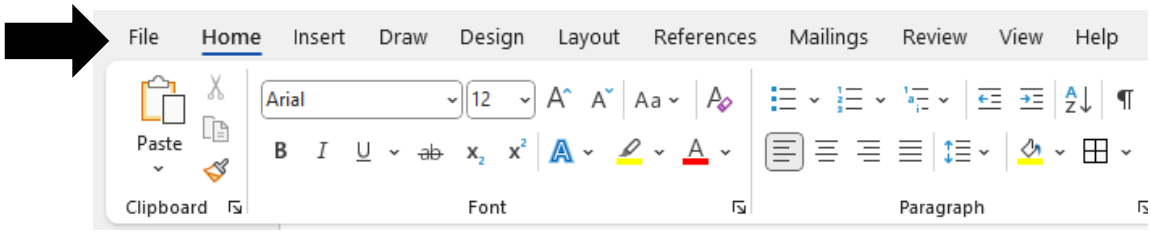


6.2. Complete the two-point perspective boxes below. The Horizon Line and two vanishing points are shown below as well as the starting lines for each box. There are three separate boxes. (8)



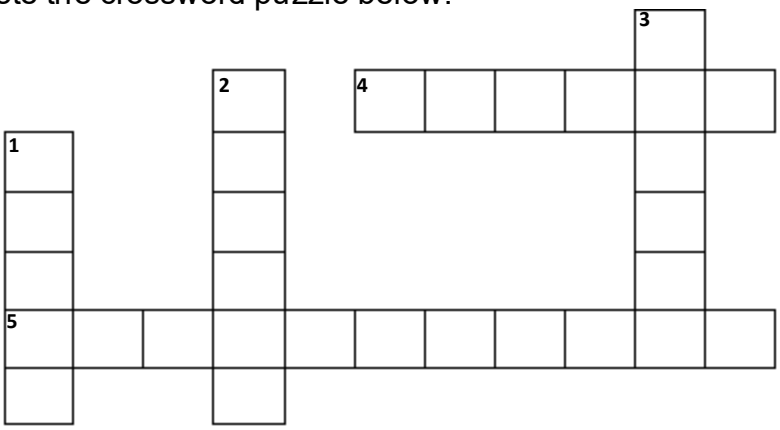
COMPUTER LITERACY [10]

1. Using the image below, name the Ribbon Menu Option (tab) that you would find the following features under: Example. "**File**" – To save a document. (5)



1.1. To add SmartArt to a document _____
1.2. To add a Watermark to a document _____
1.3. To add a Bibliography to a document _____
1.4. To change the font of text in a document _____
1.5. To edit the page margins of a document _____

2. Complete the crossword puzzle below: (5)



DOWN

1. An easy way to change the format of a heading
2. The bottom of a page that will contain the page number
3. The gap between the edge of the page and the text

ACROSS

4. The menu option to save a new or existing document with a different file name
5. To increase the gap between each line in a paragraph

p