EXAMINATIONS COUNCIL OF ESWATINI
Junior Certificate Examination

CANDIDATE NAME								
CENTRE NUMBER					CANDIDATE NUMBER			

DESIGN AND TECHNOLOGY **537/01**

Paper 1 **October/November 2025**

2 hours

Candidates answer on the question paper.

Additional Materials: Standard Drawing Equipment

READ THESE INSTRUCTIONS FIRST

Write your name, centre number and candidate number in the spaces provided at the top of the page.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams, graphs, or rough working.

Do **not** use staples, paper clips, glue or correction fluid.

This paper consists of **two (2)** sections, Section **A** and Section **B**.
Answer **all** questions.

The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
Section A	
Section B1	
Section B2	
Section B3	
Total	

This document consists of **18** printed pages and **2** blank pages.

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For Examiner's Use

Section A [40marks]

Answer **all** questions in this section.

1 Fig. 1 shows a holding device used in the school workshop.

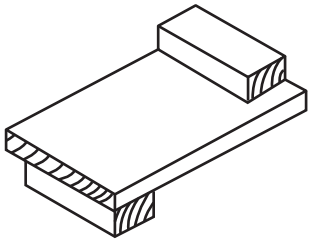


Fig. 1

(a) Name the holding device.

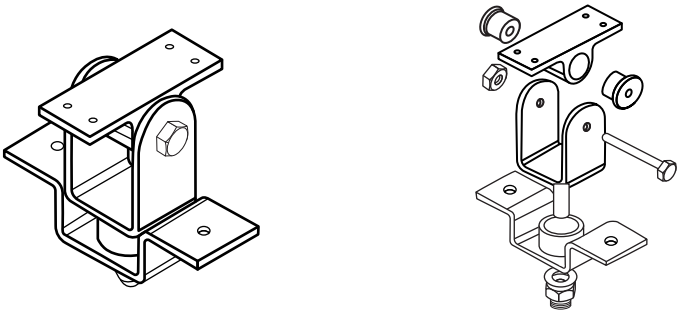
..... [1]

(b) State the use of the holding device.

.....

..... [1]

2 Fig. 2 shows two drawings of an adjustable pulpit design.



A **B**

Fig. 2

A is an assembly drawing while **B** is an ……. drawing. [1]

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3 Fig. 3 below shows a plastic T-square.

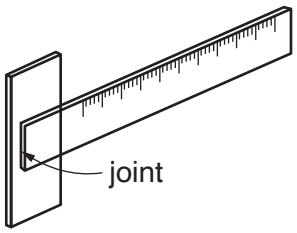


Fig. 3

(a) Name **one** type of plastic that is suitable for making the T-square.

..... [1]

(b) State **one** adhesive that can be used to join the two parts.

..... [1]

4 A member of a structure that resist bending is called a ……..…… [1]

5 State **two** safety precautions that would be followed when painting in the workshop.

Precaution 1……..…… [1]

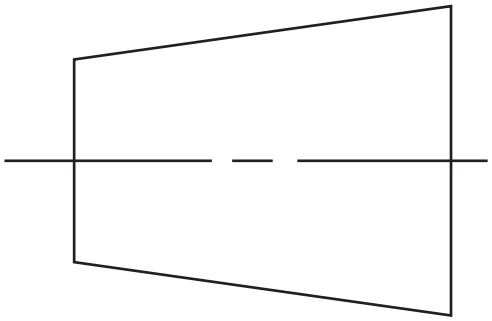
Precaution 2 ……... [1]

6 Fill the table below by naming the two boring tools and state their uses.

Boring tools	Name	Use
	.....	....
	.....	....

[4]

7 Complete the 3rd angle orthographic projection symbol shown below.



[3]

8 Fig. 4 shows a water tap made from brass.



Fig. 4

Give **one** advantage of brass which makes it more suitable for the tap than mild steel.

Advantage ..... [1]

9 Fig. 5 shows a piece of wood being prepared for use.

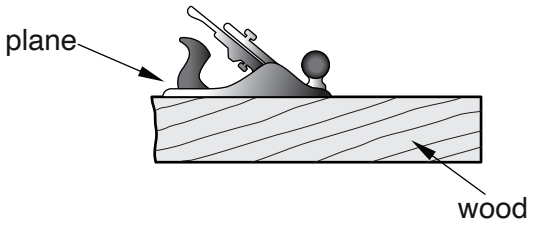


Fig. 5

(a) What is the name of the plane?

..... [1]

(b) Give **one** specific use of the plane.

..... [1]

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10 Fig. 6 shows a sectioned view of two blocks of wood that will be joined by a screw.

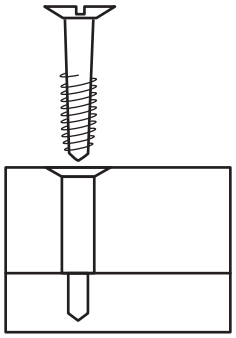


Fig. 6

(a) Name the type of screw used to join the wooden blocks.

..... [1]

(b) Give **one** advantage of using screws over nails in joining wood.

..... [1]

(c) Add hatching to the blocks in fig. 6 to show that they are sectioned. [4]

11 Fig. 7 shows two pieces of wood that will be joined together using dowel joint.

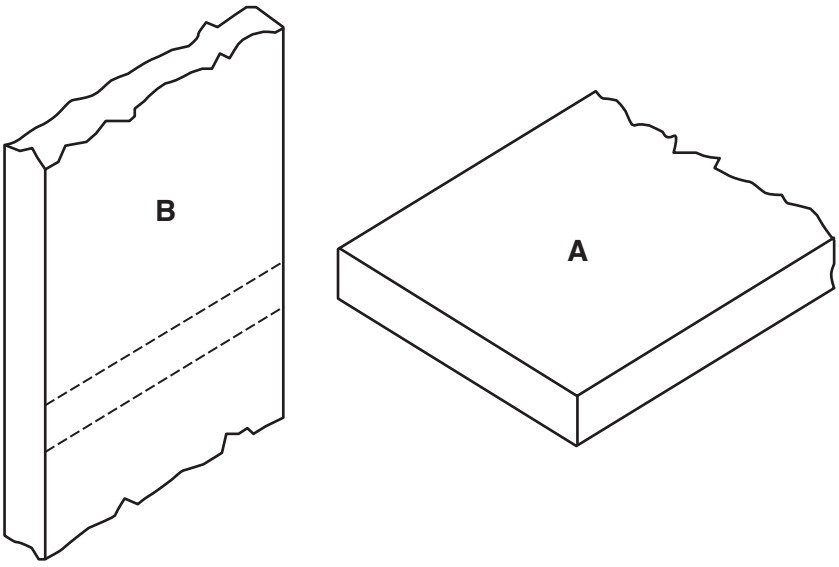


Fig. 7

Draw on Fig. 7 to show **one** dowel on piece **A** and **one** hole on piece **B**. [3]

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12 Fig. 8 shows a sketch of vacuum former ready for use.

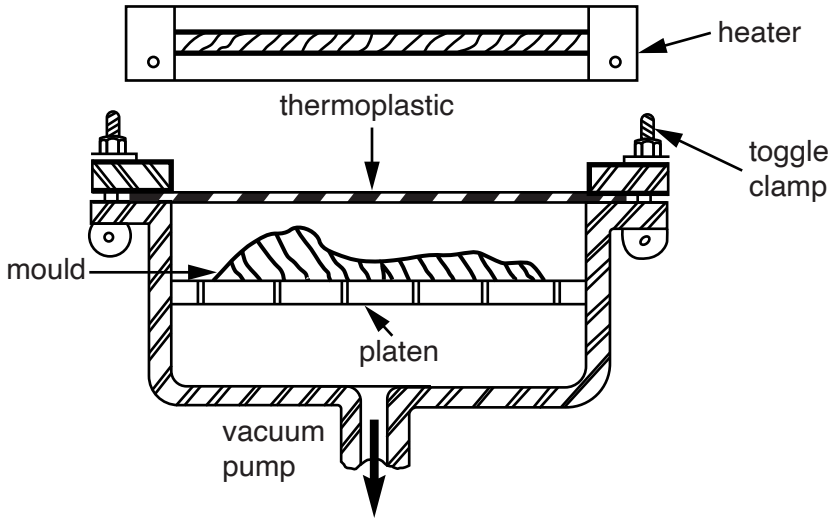


Fig. 8

(a) Give **one** advantage of using vacuum forming over press forming.

..... [1]

(b) State **two** stages in the process of vacuum forming after placing the mould and clamping the thermoplastic in the toggle clamp.

Stage 1: place mould in the former, clamp the plastic on the former.

Stage 2..... [1]

Stage 3..... [1]

13 Complete the table below by naming the metal/class that matches each of the following.

Metal	**Classification**	**use**
Aluminium	Non-ferrous	Making aircraft bodies
Copper	……..……..	Water pipes
……..	Ferrous metal	Garden tools

[2]

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14 Fig. 9 shows a belt and pulley mechanism.

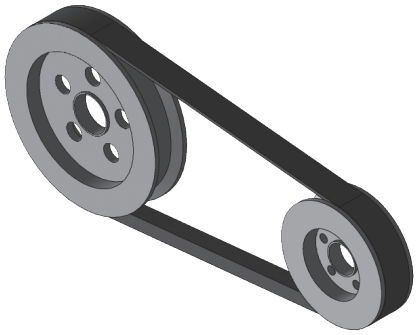


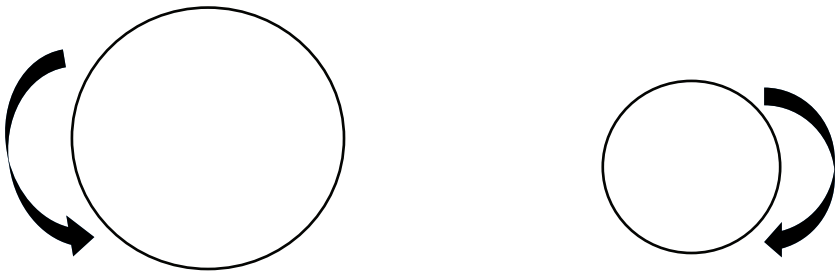
Fig. 9

(a) Give **one** disadvantage of belt and pulley over gears.

……

…… [1]

(b) Using free-hand add the belt to the diagram below to make the pulleys move opposite direction to the other. [2]



drive pulley driven pulley

15 Give **two** advantages of using seasoned timber over green timber.

1…… [1]

2…… [1]

16 List **three** steps of cutting out a through housing joint after marking it.

1……

……

2……

……

3……

……

[3]

Section B [60 marks]

Answer **all** questions

Question B1 [20 Marks]

1 Fig. 10 shows a solid geometry object.

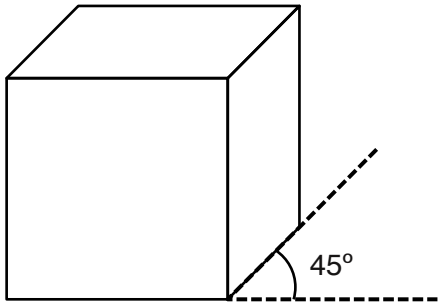


Fig. 10

(a) State the correct name of projection used to draw the object.

…….. [1]

(b) Name the solid object drawn in Fig. 10.

…….. [1]

2 Fig. 11 is a triangle.

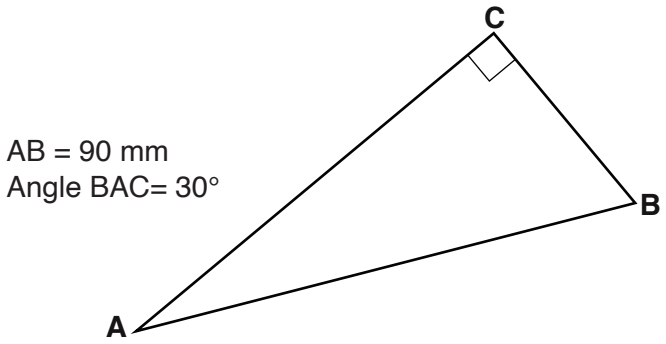
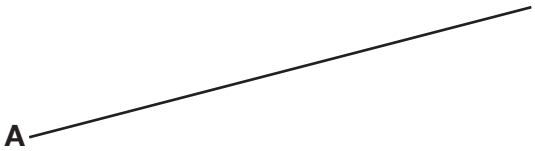


Fig. 11

(a) Using geometrical construction complete the triangle given line **A** as a starting point.



[5]

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(b) State the correct name of the triangle.

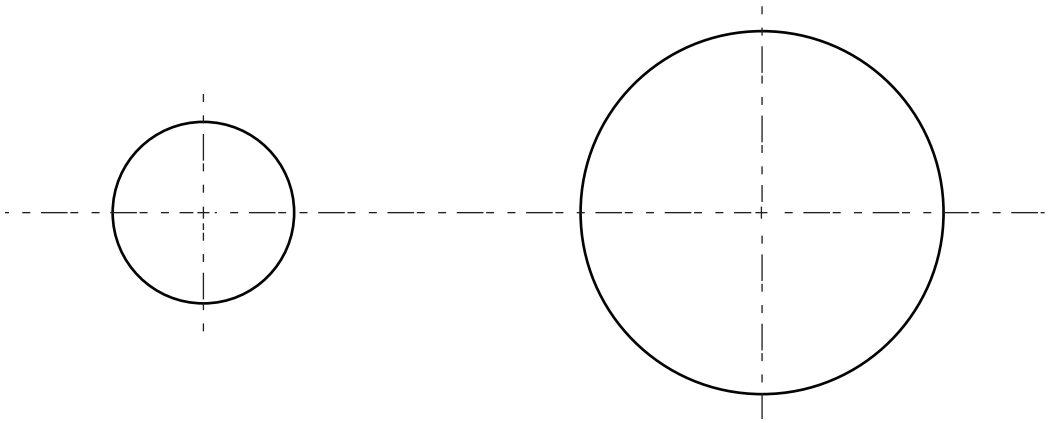
……... [1]

3 Fig. 12 shows that the chain is tangential to both sprockets.



Fig. 12

Given below is an incomplete graphical representation of Fig. 12.Use geometrical constructions to draw the **bottom part only** of the chain.



[4]

4 Fig. 13 shows a hexagonal box made from lightweight material.

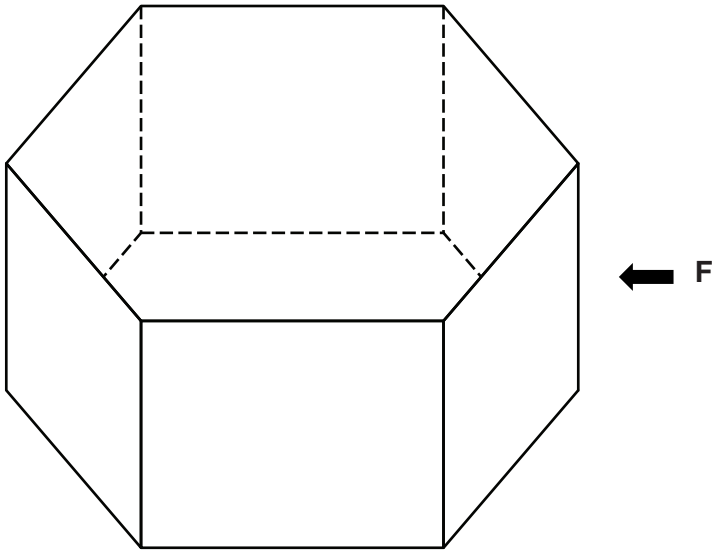


Fig. 13

Using geometrical construction draw the following from Fig. 13;

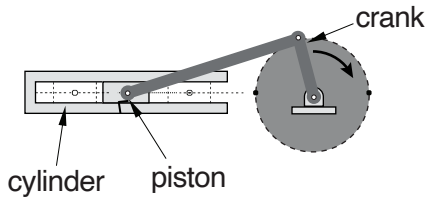
(a) A front looking from direction **F**

(b) A plan

Do not include hidden details.

[5]

5 Fig. 15 is a crank mechanism and a line diagram of the mechanism.



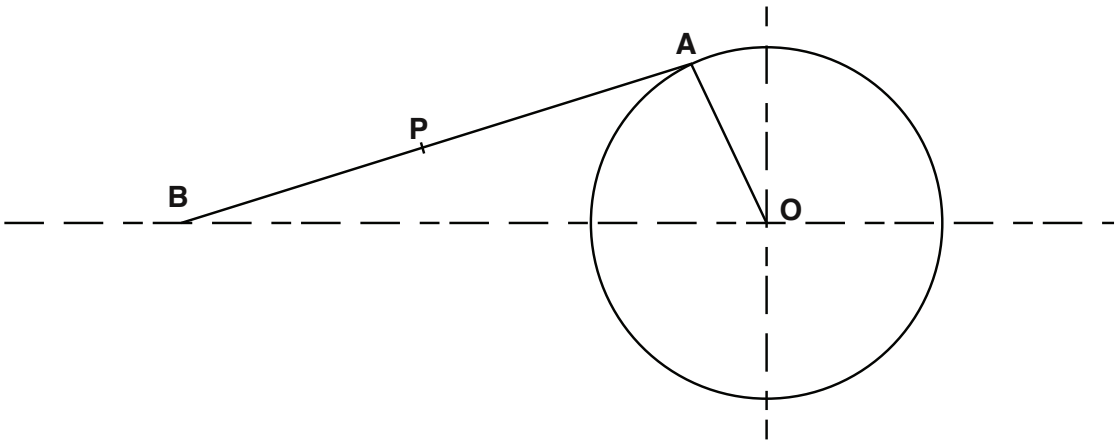


Fig. 15

Plot the locus of point '**P'** as the crank **OA** complete one revolution as point **B** slides on the horizontal centre line. [3]

Question B2 [20 Marks]

1 Fig. 16 shows a commonly used tool.

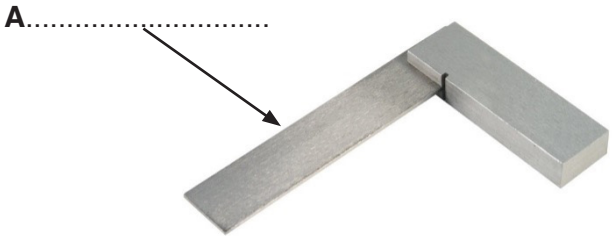


Fig.16

(a) Label part **A** of the tool on Fig. 16. [1]

(b) Name the tool.

…….. [1]

2 Fig. 17 is showing a student using a machine in a school workshop.

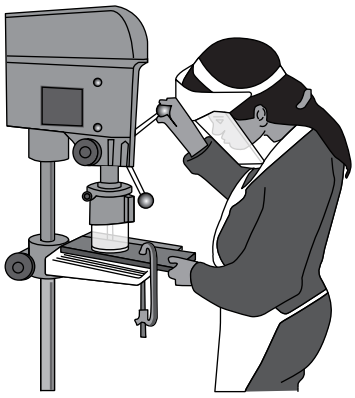


Fig.17

Name the machine.

…….. [1]

3 What is the function of the cutting tool shown in Fig. 17?

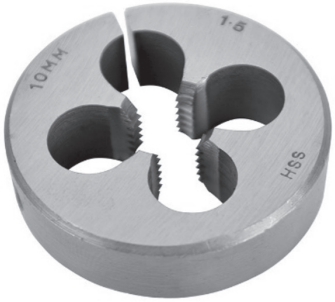


Fig.18

…….. [1]

4 Fig. 19 shows how a hole is marked on a 3 mm thick mild steel.

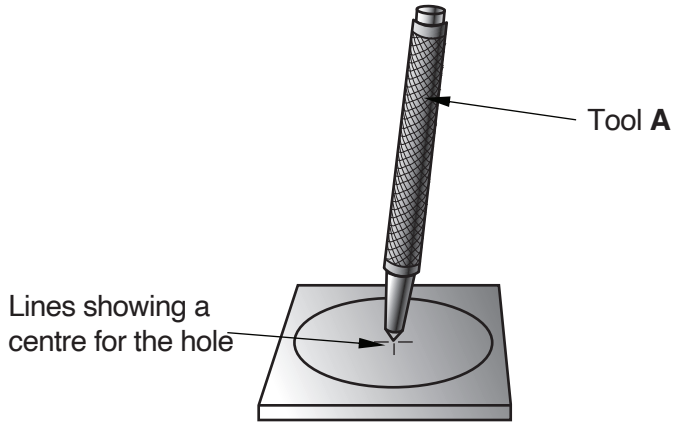


Fig. 19

(a) Name tool **A**.

…… [1]

(b) State **one** holding device that will be used to hold the mild steel when the hole is produced.

…… [1]

5 Fig. 20 shows a marking gauge.

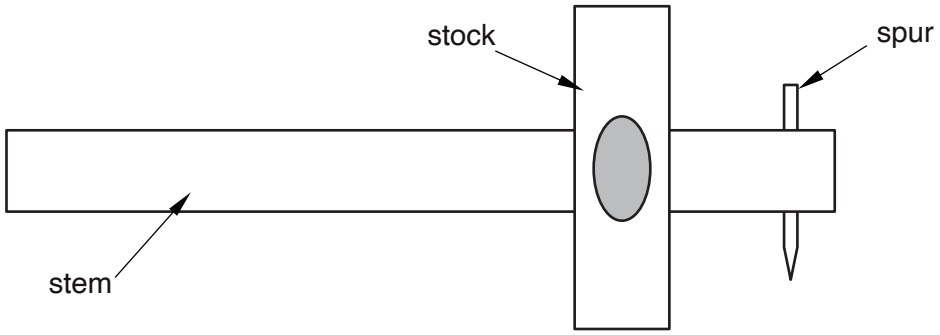


Fig. 20

(a) Add a steel rule on the marking gauge to show how the gauge would be set to the required distance. [2]

(b) Give **one** practical example where this tool can be used.

…… [1]

6 Fig. 21 shows a work piece held on a workbench when cutting a lap joint.

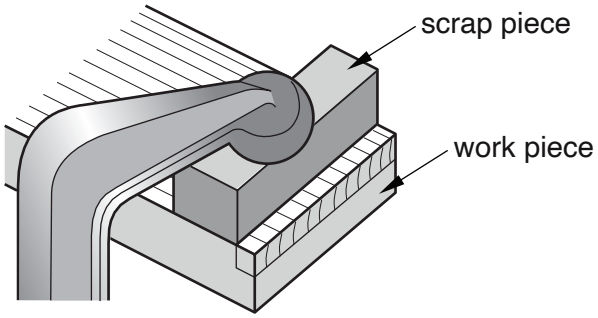


Fig. 21

Give **two** reasons of using the scrap piece of wood.

Reason 1…… [1]

Reason 2…… [1]

7 Annealing is the processes to solve the problem of work hardening of metals.

Describe how mild steel is annealed?

…….

…….

……..... [2]

8 Fig. 22 shows a spice rack made from acrylic.



Fig. 22

(a) Give **one** reason why acrylic sheet is covered with plastic or paper when purchased.

…….. [1]

(b) Why is a scriber not recommended to mark the two bends on the rack?

…….. [1]

(c) Give **one** reason why the acrylic is softened before bending to shape.

…….. [1]

(d) How can cracking be prevented when drilling one hole of the spice rack?

…….. [1]

(e) Describe how to finish rough sawn acrylic spice rack edges.

Step 1……..…… [1]

Step 2…….. [1]

Step 3…….. [1]

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Question B3 [20 Marks]

1 The world around us is made of different structures.

(a) What is a structure?

…….. [1]

(b) Describe a strut.

…….. [1]

(c) Name one natural frame structure.

…….. [1]

2 A gear is a machine component that transmit and modify rotary motion and torque.

List **one** gear that convert rotary motion into a linear motion.

Rotary to linear …….. [1]

List **one** gear that is conically shaped

Conical shaped gear …….. [1]

3 Fig. 23 shows an incomplete model of an engine crank system.

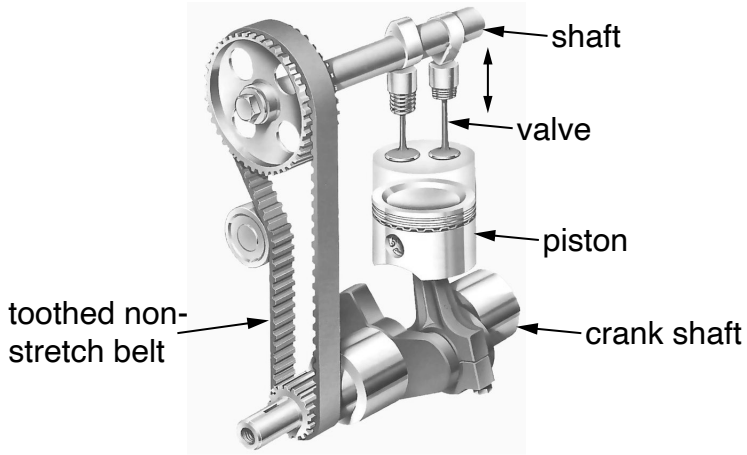


Fig. 23

(a) State the type of movement made by the valves in this model.

…….. [1]

(b) Name the type of mechanism which moves the valve.

…….. [1]

(c) The belt used in this mechanism is toothed, why?

…….. [1]

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4 Fig. 24 shows a hand vice which uses a lever mechanism to perform its function.

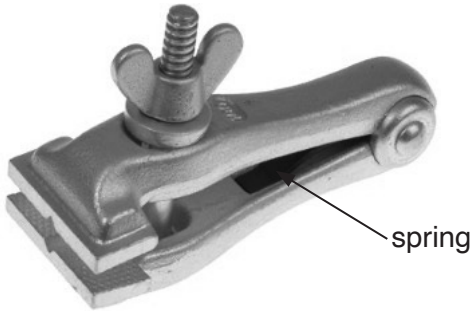


Fig. 24

(a) On the vice label the **effort**, **fulcrum** and **load**. [3]

(b) What will happen if the spring is removed from the device?

……..... [1]

(c) In which class of levers can the hand vice be classified?

……..... [1]

5 Fig. 25 shows a mechanism used in some systems.

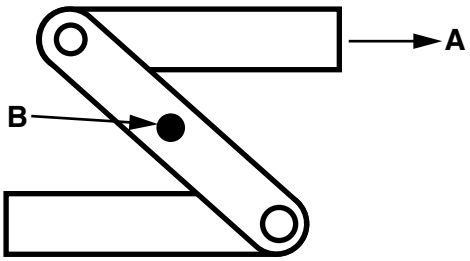


Fig. 25

(a) Show the direction of the output if the input in the direction of arrow **A** and point **B** is the pivot. [1]

(b) Name the mechanism.

……..... [1]

(c) Give **two** reasons why this type of mechanism is important in systems.

1……..... [1]

2……..... [1]

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6 Fig. 26(a) shows a gate fixed to a wall. The frame of the gate has a problem.

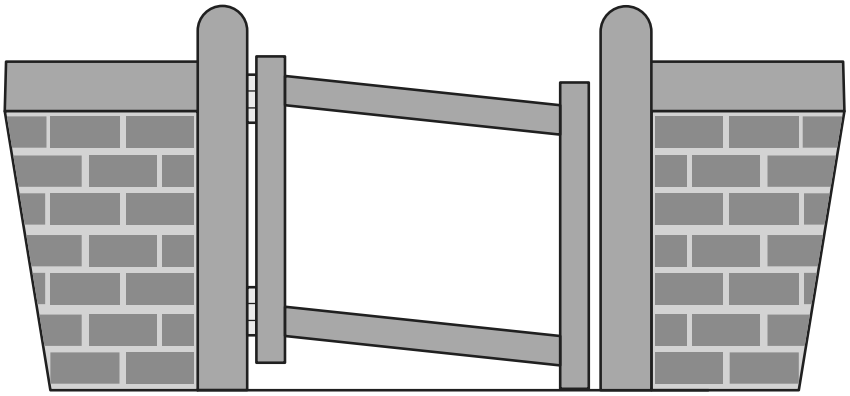


Fig. 26(a)

(a) Identify and state the problem on this gate.

……..…… [1]

(b) Add sketches and notes to Fig. 26(b) to show how the problem identified in **(a)** can be prevented. [2]

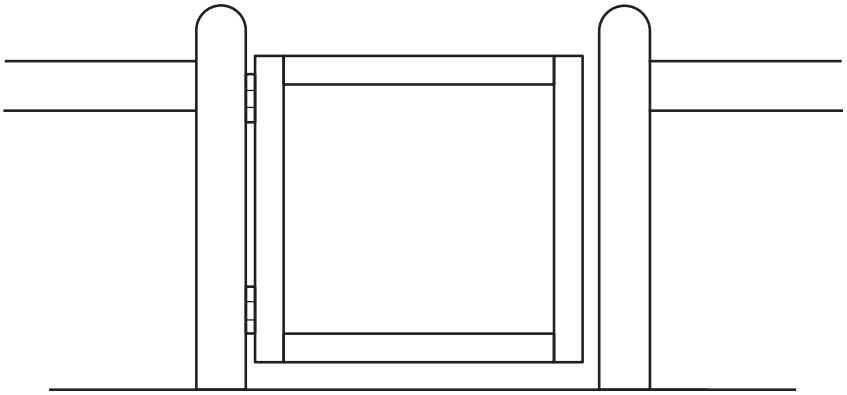


Fig. 26(b)

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