EXAMINATIONS COUNCIL OF ESWATINI
Junior Certificate Examination

CANDIDATE NAME								
CENTRE NUMBER					CANDIDATE NUMBER			

DESIGN AND TECHNOLOGY **537/01**

Paper 1 **October/November 2022**

2 hours

Candidates answer on the Question Paper.
Additional Materials: Standard Drawing Equipment

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name in the spaces provided at the top of the page.
Write in blue or black pen in the spaces provided on the Question Paper.
You may use a pencil/pen for any sketches, drawings, or rough working.
Do **no**t use staples, paper clips, highlighters, 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 marks	

This document consists of **21** printed pages and **3** blank pages.

 [Turn over

For Examiner's Use

Section A [40 marks]

Answer **all** questions

1 Fig. 1 shows a set of Graphics Product equipment.

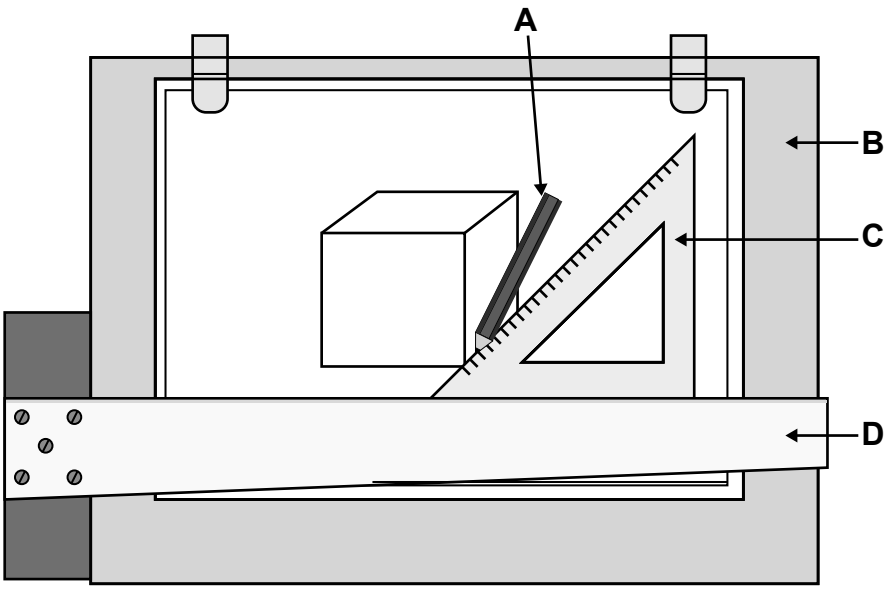


Fig. 1

Name the items labelled **A, B, C** and **D**.

A ……[1]

B ……[1]

C ……[1]

D ……[1]

2 Fig. 2 shows two tools used in Design and Technology.

E **F**

Fig. 2

Name the tools labelled **E** and **F**.

E……[1]

F……[1]

For Examiner's Use

3 Fig. 3 shows a sheet of plastic which has been prepared for bending.

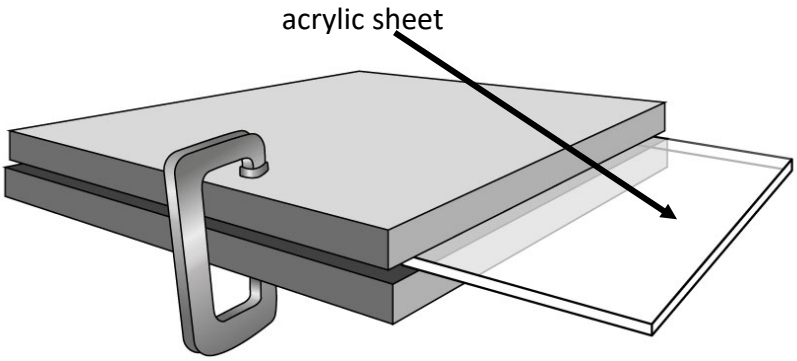


Fig. 3

Name **one** equipment that can be used for heating the plastic.

……[1]

4 Shown in Fig. 4 is a peg.

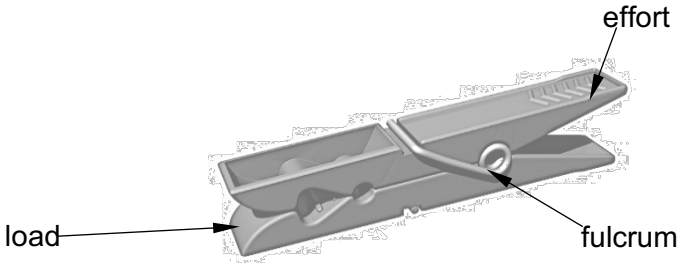


Fig. 4

Name the class of levers in which the peg belongs.

……[1]

5 Describe a situation in the workshop where the following safety items could be necessary.

Goggles...……...……...

……[1]

Ear defenders...……...……

……[1]

For Examiner's Use

6 Fig. 5 shows a type of hinge used in Design and Technology.

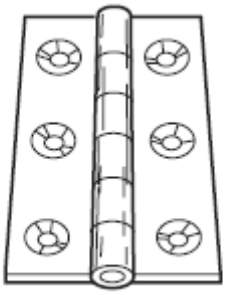


Fig. 5

(a) Name the type of hinge.

……[1]

(b) Give a situation where this hinge could be used.

……[1]

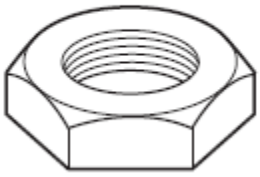
7 Shown in Fig. 6 is a road sign.

Fig. 6

Name the geometrical shape of the road sign.

……[1]

8 Two items used in assembly are shown in Fig. 7.



G

H

Fig. 7

Name the two items labelled **G** and **H**.

G……[1]

H……[1]

For Examiner's Use

9 Fig. 9 shows a piece of metal with a threaded hole.

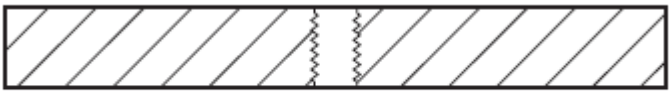


Fig. 9

Name **one** tool used to produce the threads.

……[1]

10 Shown in Fig. 10 is a small wooden frame.

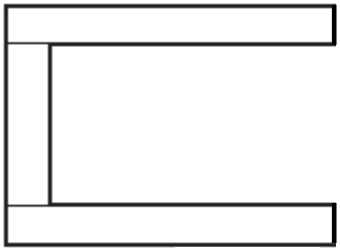


Fig. 10

Name **one** tool that can be used to test for squareness of the frame.

……[1]

11 Fig. 11 shows a plastic money box.

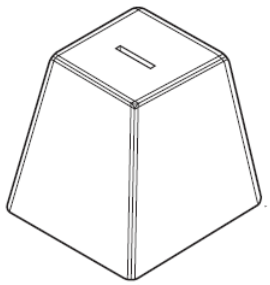


Fig. 11

(a) Name **one** suitable thermo-plastic for making the money box.

……[1]

(b) Name the process of producing the money box.

……[1]

For Examiner's Use

12 Fig. 12 shows a graphical representation of the number 2.

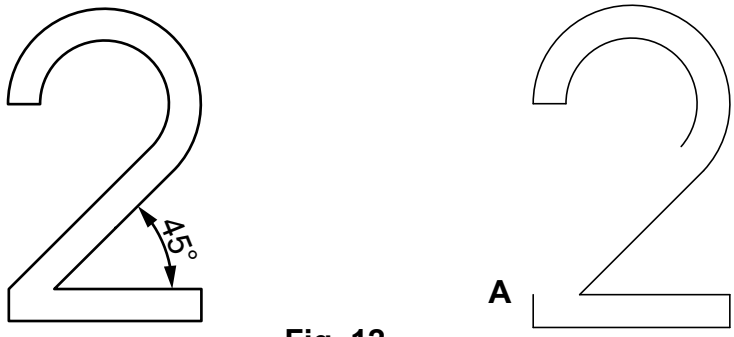


Fig. 12

Complete the number on the right by constructing a line from point **A**. [5]

13 Shown in Fig. 13 is a shape cut out of a 4 mm piece of plastic.

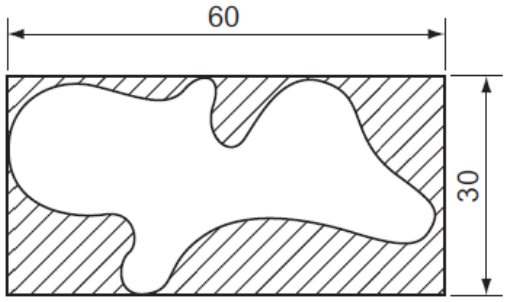


Fig. 13

Name **one** suitable saw that can be used to cut out the shape.

……[1]

14 Fig. 14 shows pieces of wood joined together to make a wide board.

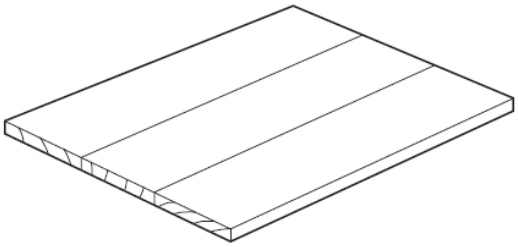


Fig. 14

(a) Name **one** suitable device that can be used to hold the pieces of wood together when gluing.

.....[1]

(b) Show on Fig. 14 how the pieces of wood could be held together when gluing**.** [3]

For Examiner's Use

15 Shown in Fig. 15 is a lantern used to provide light outside a house.

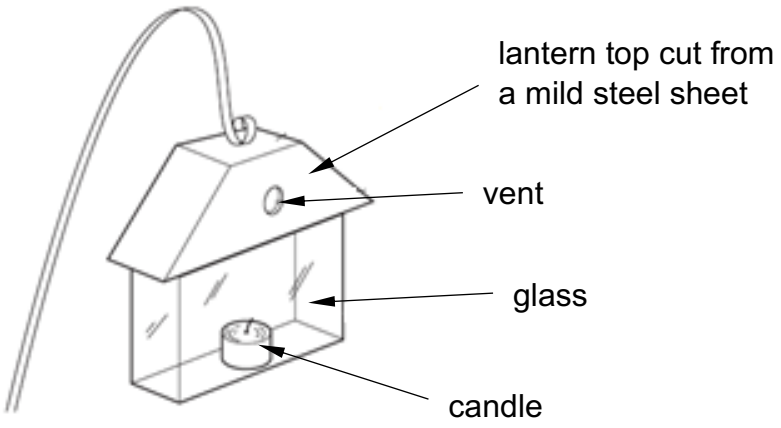


Fig. 15

(a) Name **one** type of finish that can be applied on the mild steel top part of the lantern.

……..[1]

In the space provided below sketch a development of the top mild steel part of the lantern. Do not sketch to scale.

[3]

16 A construction site is shown in Fig. 16.

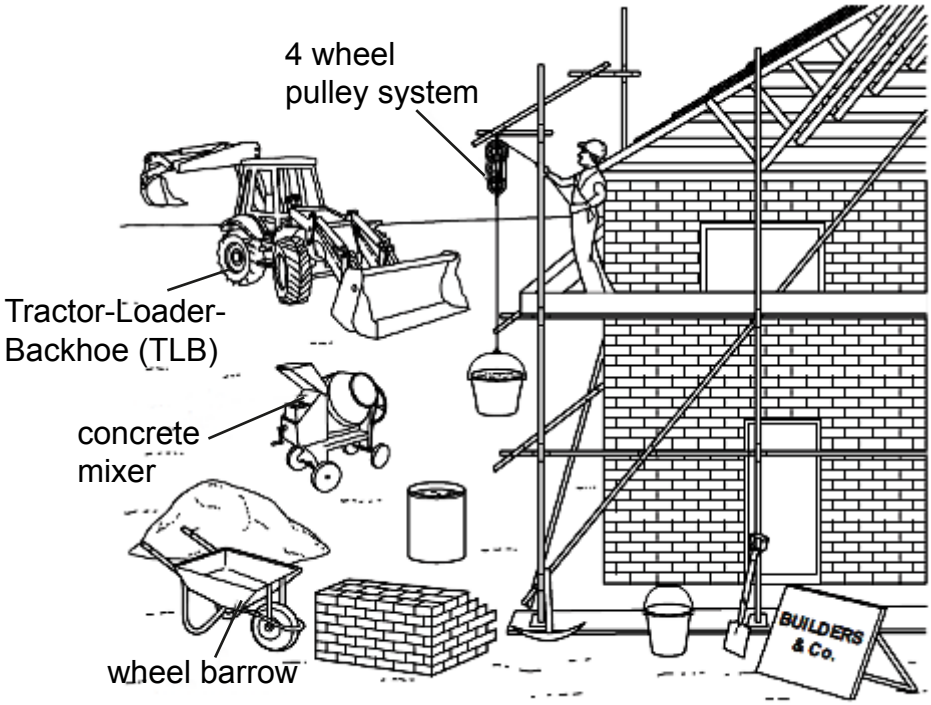


Fig. 16

Identify **one** product that has got linkages.

……[1]

17 Shown in Fig. 17 is a plastic gutter.

Fig. 17

Give **one** reason why Polyvinyl Chloride (PVC) is suitable for making the plastic gutter.

……[1]

18 Fig. 18 shows a tool used for cutting materials.

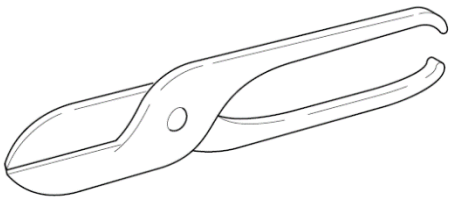


Fig. 18

Name the tool.

……[1]

19 Shown in Fig. 19 is a wooden computer stand.

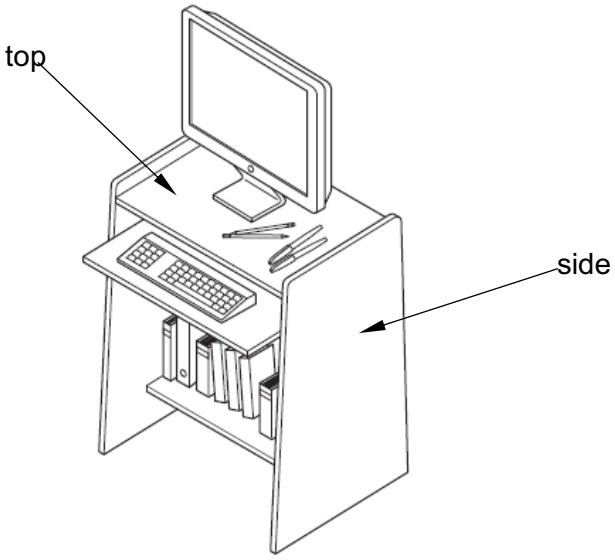


Fig. 19

(a) Name **one** hardwood that is suitable for making the computer stand.

……[1]

(b) Name **one** specific method that can be used to join the top and the sides.

……[1]

(c) Suggest **one** type of finish that can be applied to the computer stand without changing the colour of the wood.

……[1]

For Examiner's Use

20 Fig. 20 shows a holding tool.

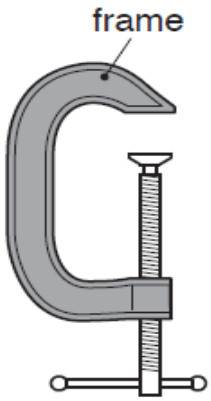


Fig. 20

Name the tool.

……..[1]

Section B [60 marks]

Answer **all** questions

For Examiner's Use

Question B1 [20 Marks]

1 Shown in Fig. 1 is a solid geometry object.

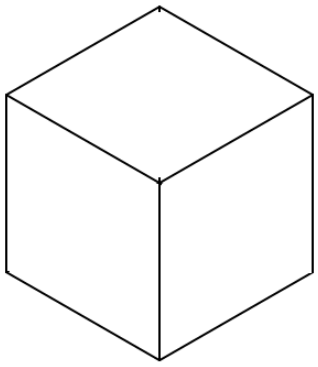


Fig. 1

State the correct name of the object.

……..……[1]

2 Fig. 2 shows a triangle.

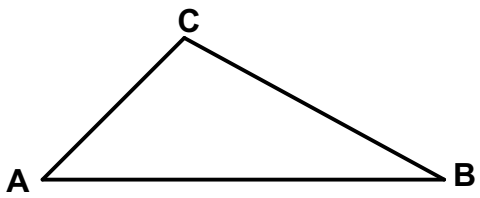


Fig. 2

AB =70, BC = 60

Angle ABC = 30^0

(a) Using geometrical constructions draw the triangle in the space to the right. [5]

(b) State the correct name of the triangle drawn in **(a)**.

……..…[1]

For Examiner's Use

3 Fig. 3(a) shows a logo of a kindergarten school. Fig. 3(b) shows an incomplete drawing of the logo.

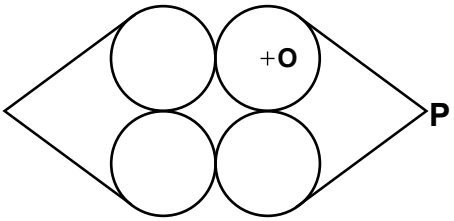


Fig. 3(a)

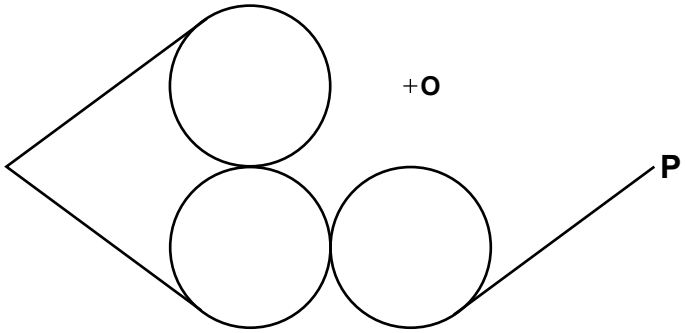
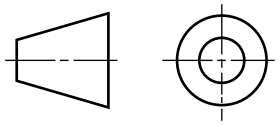
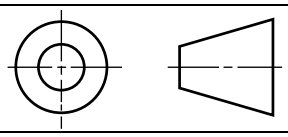


Fig. 3(b)

Using geometrical construction complete the logo by adding the missing parts. Point **O** is the centre of the missing circle. [5]

4 The table below shows symbols of projection. Complete the table by stating the correct names of the projection.

Symbol	Name of projection
	.....
	.....

[2]

For Examiner's Use

5 Shown in Fig. 4 are two views of a cone made from a card.

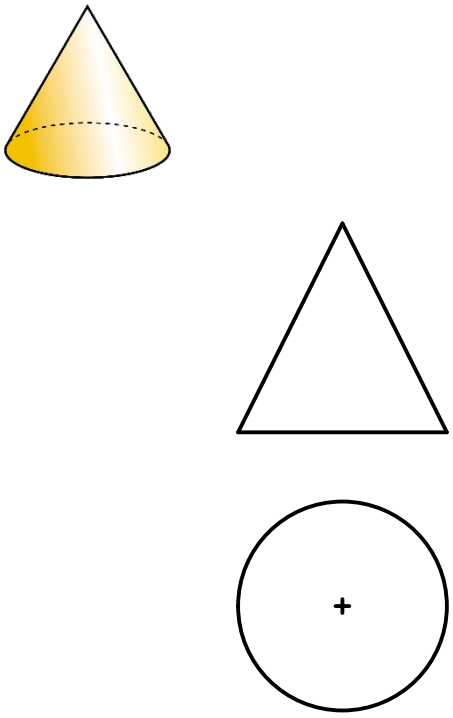


Fig. 4

(a) Using geometrical construction draw a development (net) of the cone. Do not include the base. [4]

(b) Give the correct name of drawing produced in (a).

……[1]

6 Shown in Fig. 5(a) is an exploded drawing of a housing joint.

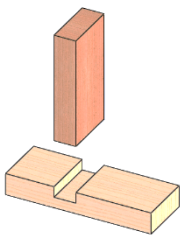


Fig. 5(a)

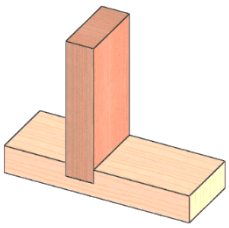


Fig. 5(b)

Give the correct name of the type of drawing in Fig. 5(b).

……[1]

For Examiner's Use

Question B2 [20 Marks]

1 Fig. 1 shows a tool used in Design and Technology.

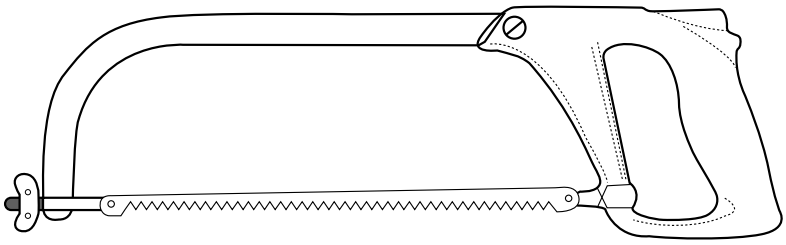


Fig. 1

(a) Name the tool.

……[1]

(b) Give the use of the tool.

……[1]

2 Shown in Fig. 2 is a marking out tool.

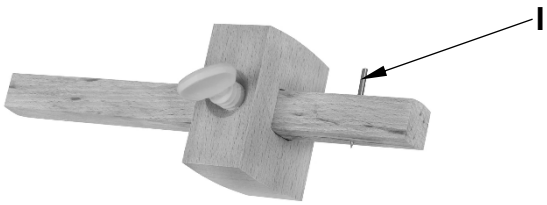


Fig. 2

(a) Name the tool.

……[1]

(b) State the specific use of the tool.

……[1]

(c) State the name of the part labelled **I**.

……[1]

For Examiner's Use

3 A mobile cloth hanger is shown in Fig. 3.

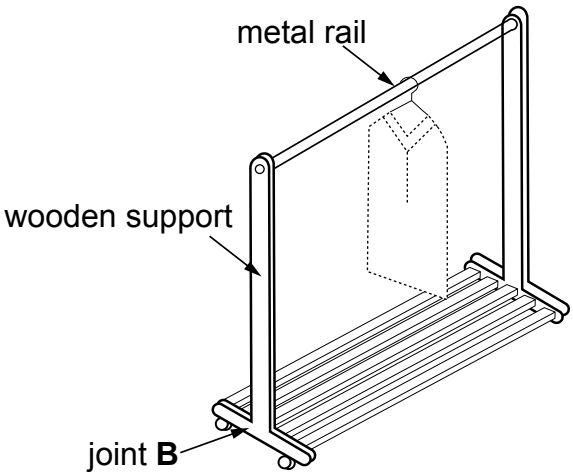


Fig. 3

(a) Suggest **one** type of ferrous metal that can be used for making the rail.

…… [1]

(b) Name **one** suitable joint that can be used at **B**.

…… [1]

(c) In the space provided below sketch the joint you have named in **(b)**.

[3]

4 Fig. 4 shows a piece of acrylic that has been marked out.

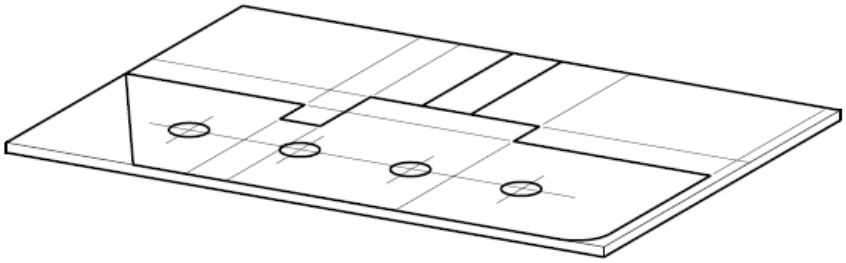


Fig. 4

(a) Name **two** tools that can be used in the marking out.

1……..[1]

2……..[1]

(b) State how cracking of the plastic can be prevented when drilling the through holes.

……[1]

5 Fig. 5 shows a desk tidy made from plastic.

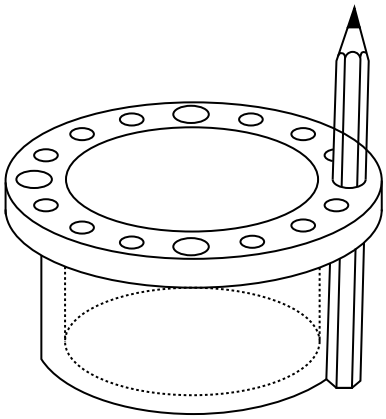


Fig. 5

Show on Fig. 5 by means of sketching how the design can be improved to stop the pencils from falling off when lifting the desk tidy. [2]

6 Timber is divided into two classes.

Name the **two** classes.

1.....[1]

2……[1]

7 Shown in Fig. 6 are two pieces of tinplate joined together.

Fig. 6

(a) Name the type of joint.

……[1]

(b) State how the joint named in **(a)** can be made strong other than riveting.

……[1]

For Examiner's Use

8 Fig. 7 shows a wooden box.

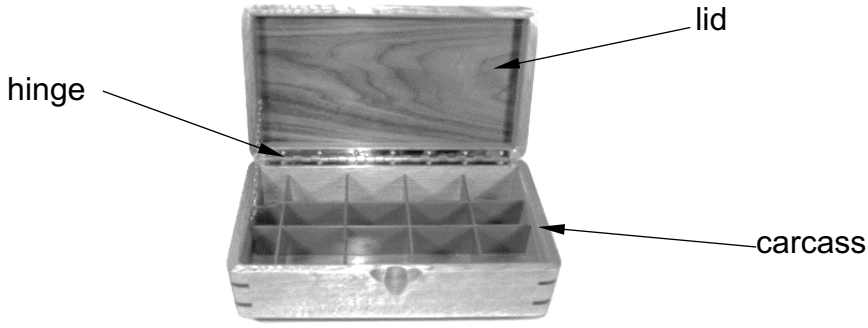


Fig. 7

Name the type of hinge that has been used to fix the lid onto the carcass.

……[1]

Question B3 [20 marks]

For Examiner's Use

1 Fig. 1 shows part of a machine.

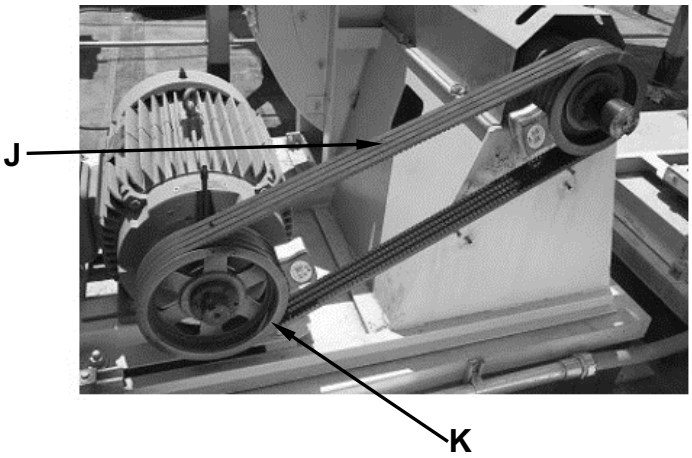


Fig. 1

(a) Briefly define *mechanism*.

……..[1]

(b) Name the type of mechanism that has been used for the machine in Fig. 1.

……..[1]

(c) Give **one** disadvantage of the mechanism stated in **(b)**.

……..[1]

(d) Give the names of the parts labelled **J** and **K**.

J.……..[1]

K.……..[1]

For Examiner's Use

2 Shown in Fig. 2 is a racking structure used in a shop.

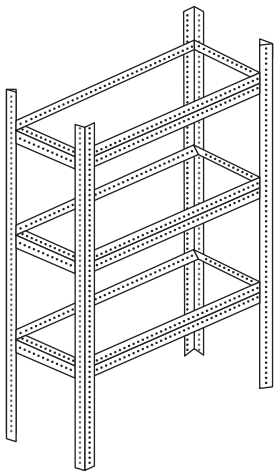


Fig. 2

(a) Identify and state the weakness of the structure.

……[1]

(b) State the type of force that will act on the structure once it is used.

……[1]

(c) Show on the diagram how the problem identified in **(a)** can be solved. [1]

3 Fig. 3 shows two parts of a mechanism.

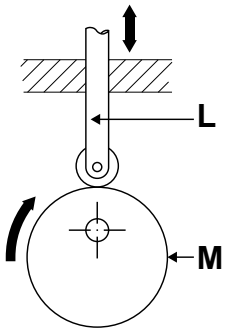


Fig. 3

(a) Name the mechanism.

……[1]

(b) Name the parts labelled **L** and **M**.

L……...[1]

M……..[1]

(c) Name the motions experienced by the two parts **L** and **M**.

Motion **L** ……..[1]

Motion **M** ……[1]

4 Fig. 4 shows a bicycle.

Fig. 4

(a) Name the type of mechanism used to produce the movement in the bicycle.

…… [1]

(b) What is the main advantage of the mechanism stated in **(a)**?

…… [1]

5 Fig. 5 shows two parts of a mechanism.

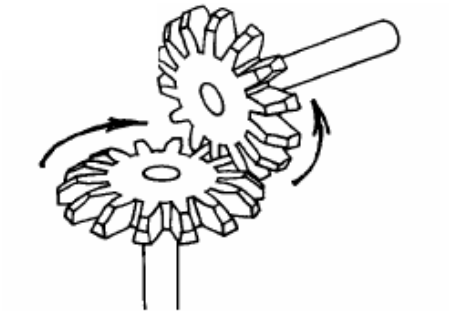


Fig. 5

(a) State the correct name of the mechanism.

…… [1]

(b) What is the function of the mechanism stated in **(a)**?

…… [1]

(c) Give **one** machine in the workshop that uses this type of mechanism.

…… [1]

For Examiner's Use

6 Fig. 6 shows an old model of an overhead projector.

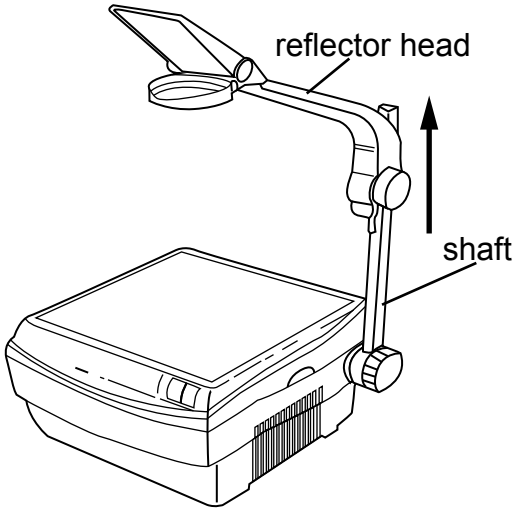


Fig. 6

(a) Name the type of mechanism that enables height adjustment of the reflector head along the shaft.

…… [1]

(b) Name the type of motion produced by the reflector head as it is moved up along the shaft.

…… [1]

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