



Coimisiún na Scrúduithe Stáit State Examinations Commission

Leaving Certificate Applied, 2010

Vocational Specialism – Engineering (240 marks)

Monday 14 June, 2010

Morning 9:30 – 11:00

General Directions to Candidates

1. Write your **examination number** in this space.
2. Answer **all** questions from Section 1.
3. Answer **any three** questions from Section 2.
4. Write your answers in the spaces provided and include sketches as appropriate.
5. Hand up this paper at the end of the examination.
6. If Question 7 is attempted, answer **any two** topics.

<i>For the Superintendent only</i>	<i>For the Examiner only</i>	
<i>Centre Stamp</i>	1. Total of end of page totals	
	2. Aggregate total of all disallowed questions	
	3. Total mark awarded (1 minus 2)	
	4. Bonus mark for answering through Irish (if applicable)	
	5. Total mark awarded if Irish Bonus (3 plus 4)	
	Note: The mark in row 3 (or row 5 if Irish bonus is awarded) must equal the total mark on the flap at the end of the script.	

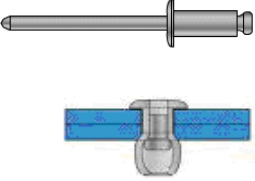
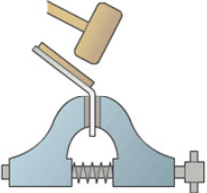



Section 1 (90 Marks)

Answer **all three** questions

Section 1 Q1.

45 marks

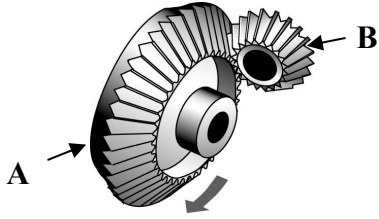
Give brief answers to **any fifteen** of the following:
(sketches may be used to explain your answers)

QUESTION	ANSWER
<p>(a) Identify the joining process shown opposite and give a practical example of where it could be used.</p> 	<p>Joining Process _____</p> <p>Use _____</p> <p>_____</p>
<p>(b) State a reason why a mallet is being used to bend the metal as shown.</p> 	<p>Reason _____</p> <p>_____</p>
<p>(c) Name the process that has been used to join the metals shown opposite.</p> 	<p>Name of process _____</p> <p>_____</p>
<p>(d) Identify the tool shown and state a suitable use for it.</p> 	<p>Name of tool _____</p> <p>Use _____</p> <p>_____</p>
<p>(e) Suggest a suitable material that could be used in making the propeller and give a reason for its suitability.</p> 	<p>Material _____</p> <p>Reason _____</p> <p>_____</p>



QUESTION

ANSWER

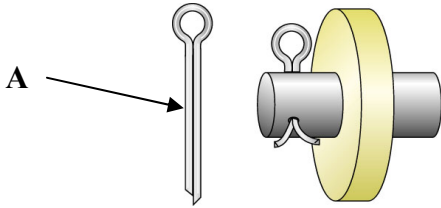
(f) Gear A is moving in the direction shown. Tick the correct box to show the direction of gear B.



Tick the box to indicate correct direction of Gear B

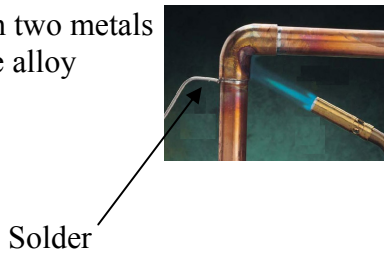
(g) Identify the pin marked A and state a reason for its use.



Name _____

Reason _____

(h) Tick the correct box to indicate which two metals are used in the alloy solder.

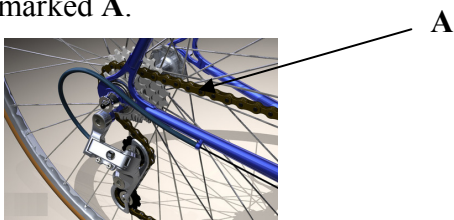


Tin + Lead

Tin + Zinc

Zinc + Lead

(i) Suggest a suitable material that could be used to manufacture the bicycle chain marked A.



Suitable material

(j) Outline **two** advantages of an adjustable spanner.



Advantage 1 _____

Advantage 2 _____

QUESTION	ANSWER
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(k) Name a suitable material used to make the anvil shown, and give **one** reason for your choice of material.



Material _____
Reason _____

(l) Tick the most suitable type of plastic that could be used to allow the frame shown to be moulded.



Thermosetting plastic
Thermoplastic

(m) State a suitable use for the battery shown.



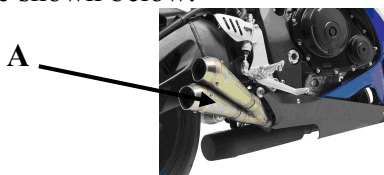
Use _____

(n) Identify the item shown below and state a suitable use for it.



Name _____
Use _____


(o) Suggest a suitable material for the exhaust pipes labelled A on the motorbike shown below.



Material for exhaust pipes

QUESTION	ANSWER
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(p) Choose a suitable material for the casing of the personal music player shown and give a reason for your choice of material.



Suitable material _____

Reason _____

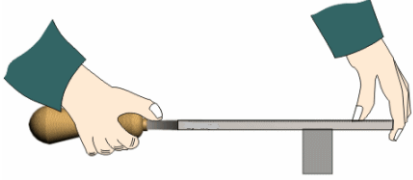
(q) Name and give a use for the special screw shown below.



Name of screw _____

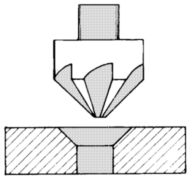
Use _____

(r) Identify **one** safety precaution that should be used when filing metal.



Safety precaution _____


(s) Name the drill bit shown below and give a reason for its use.



Name _____

Reason _____

(t) Identify the tool shown and give a use for it in the engineering room.



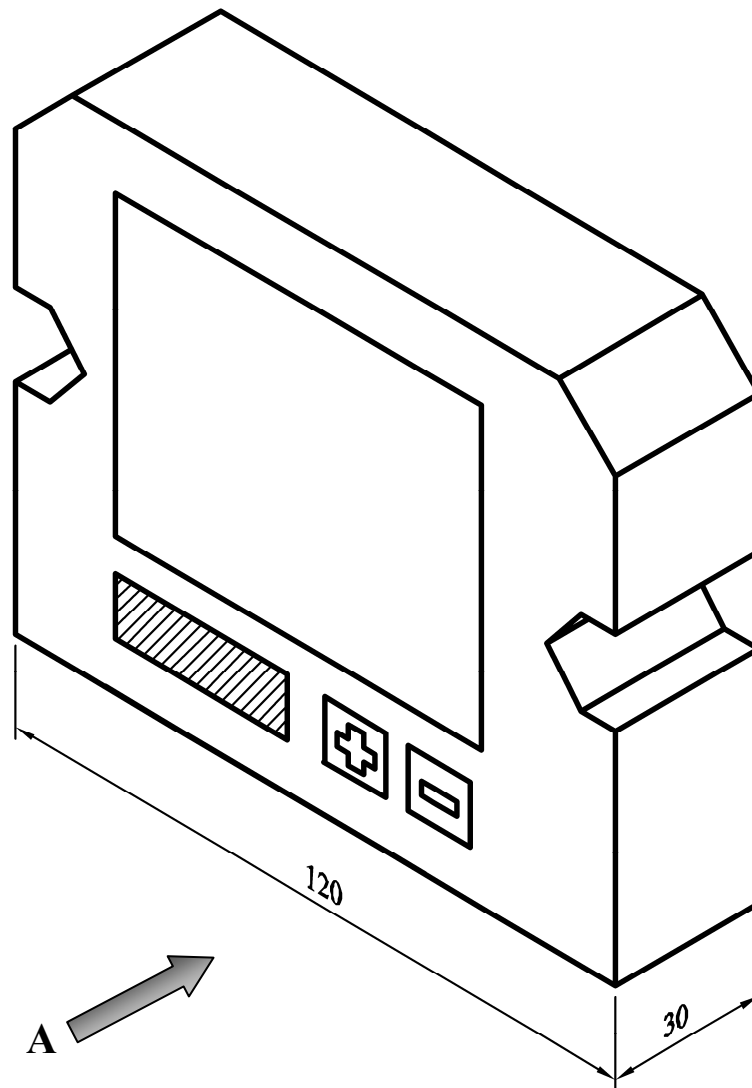
Name _____

Use _____

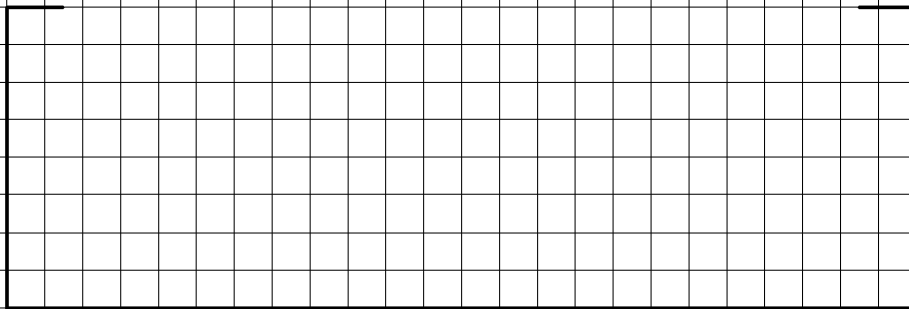
A pictorial view of a GPS unit is shown below.

Draw the following **two** views of the GPS unit on the grid paper opposite:

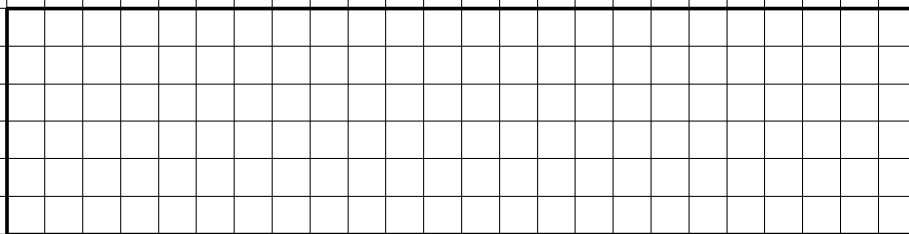
- (a) A front elevation in the direction of arrow A.
- (b) A plan projected from view (a).



Note: Each grid square is 5 mm long



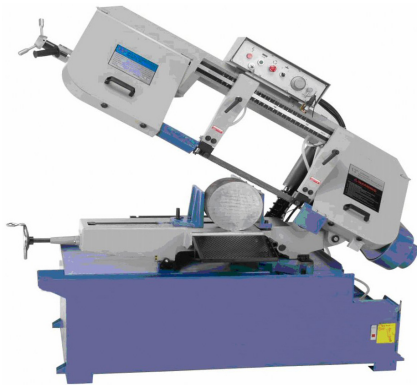
Complete the Elevation



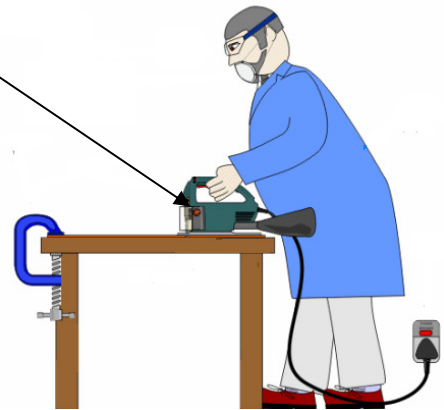
Complete the Plan

(a) Name the **two** pieces of equipment shown at **A** and **B** below. State **two** safety precautions that should be observed when operating **each** piece of equipment.

A



B



A - Name of equipment

Safety Precaution 1

Safety Precaution 2

B - Name of equipment

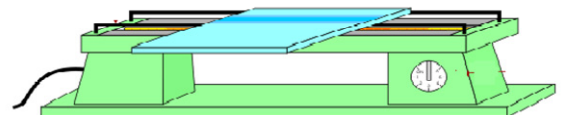
Safety Precaution 1

Safety Precaution 2

(b) The diagram shows a strip heater which is commonly used to bend plastics. Identify **two** safety precautions that should be observed by students when using the strip heater.

Safety Precaution 1 _____

Safety Precaution 2 _____



(c) Describe **any two** safety features on a drilling machine.

Safety Feature 1 _____

Safety Feature 2 _____



(d) State **one** safety precaution that should be observed when using the angle grinder shown.



(e) The safety symbols below may be found in an engineering room. Give a brief explanation for **each** of the symbols shown.

A



Symbol A _____

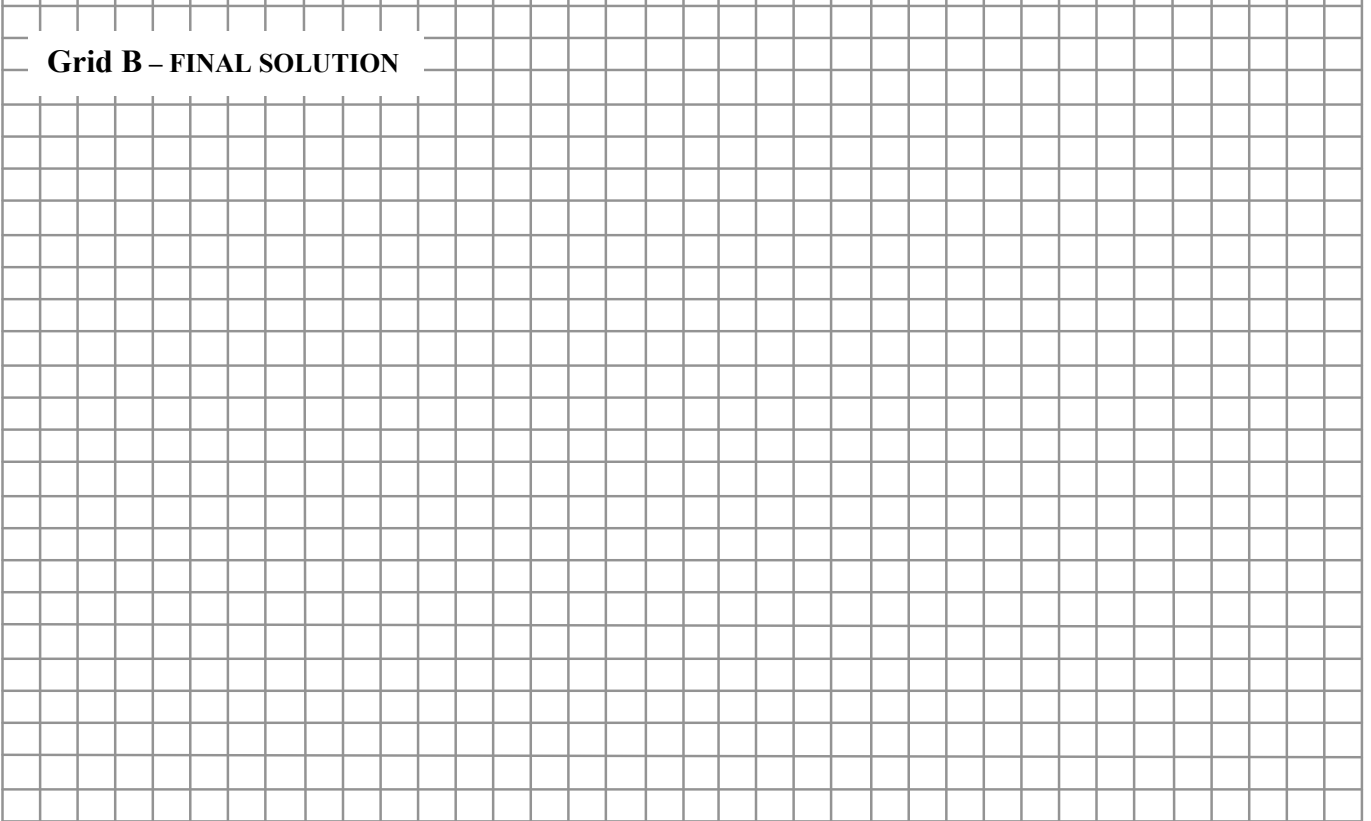
B



Symbol B _____

A sketch of the **final solution** for the support stand should be drawn below in **Grid B**.

Grid B – FINAL SOLUTION



- (b) A frame to hold two swings is shown opposite.

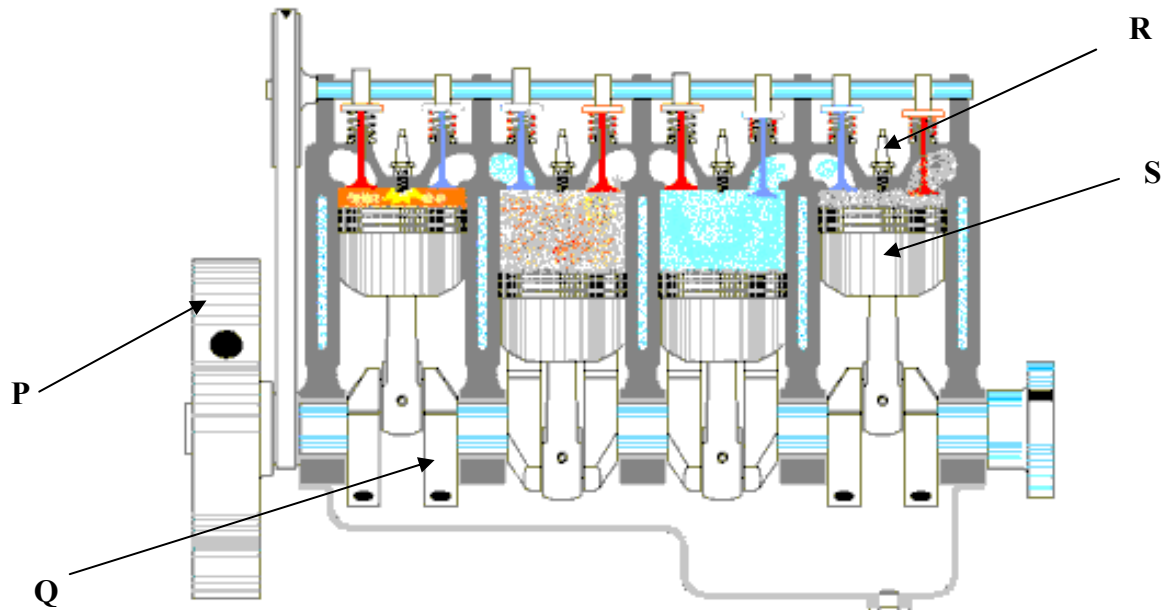


- (i) Suggest a suitable material for manufacturing the frame of the swing.

- (ii) Give **one** reason for your choice of material.

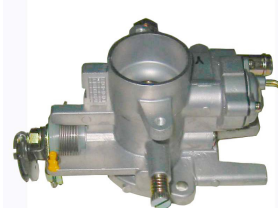
- (iii) Outline **one** reason why there are two uprights in the design shown.

- (a) A cross sectional diagram of a four stroke engine is shown below.
Name and describe the function of **each** of the labelled parts, **P**, **Q**, **R** and **S**.



Part	Name of Part	Function
P		
Q		
R		
S		

(b) Identify the engine part shown and explain its function.



Name _____

Function _____

(c) A car requires regular servicing. Below a mechanic is replacing the engine oil. In the table below name and describe **three** key steps necessary to change the engine oil in a car.



Step	Name of Step	Description
1		
2		
3		

(b) The artefact shown below is formed from a flat copper disk using a mallet and sandbag. Describe briefly, in the spaces below, **any four** key stages used to produce the artefact. (Keywords to be included in your answer should be: *cleaning, annealing, hollowing – use sketches as appropriate.*)

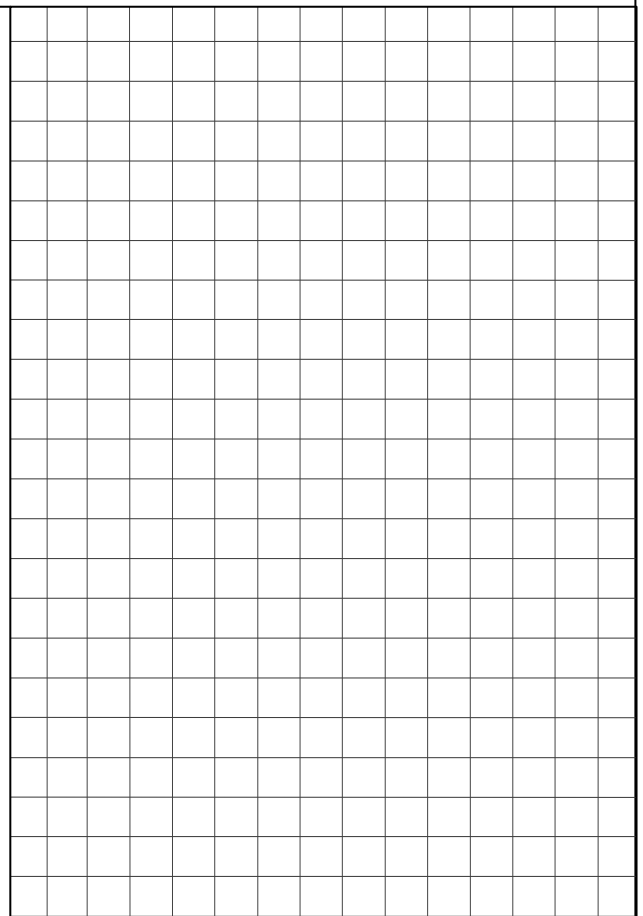


Stage 1 _____

Stage 2 _____

Stage 3 _____

Stage 4 _____



(c) State **two** safety precautions to be observed during the manufacture of the copper artefact.

Precaution 1 _____

Precaution 2 _____

Systems Module

(Any two topics comprise a full module)

Answer **any two** from the following five topics.

Topic (a) – Computer Aided Design (CAD)

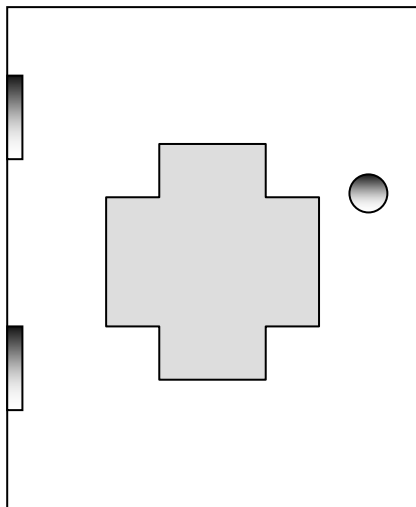
Topic (b) – Electricity

Topic (c) – Electronics

Topic (d) – Mechanisms

Topic (e) – Pneumatics

- (a) A CAD drawing of a first-aid cabinet is shown below. List **any four** CAD commands necessary to produce the drawing.



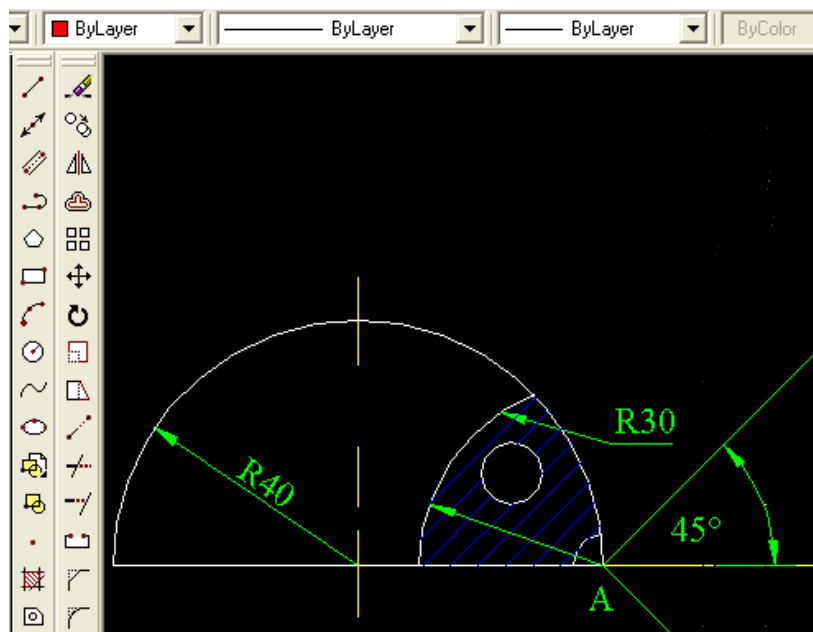
Command 1 _____

Command 2 _____

Command 3 _____

Command 4 _____

- (b) The drawing below is produced by a CAD package. Explain the procedure involved in inserting dimensions on a CAD drawing.



Procedure _____

(a) A typical selection of tools used by an electrician is shown below. Identify in the space provided, the **four** tools marked P, Q, R and S.



P _____

Q _____

R _____

S _____

(b) Name and explain the function of the electrical equipment shown opposite.

Name _____

Function _____

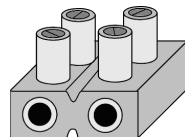


(c) Name and state a suitable use for **each** of the components shown below.



Name _____

Use _____



Name _____

Use _____



Name _____

Use _____

(a) Name and state a suitable use for **each** of the components shown below.



Name _____

Use _____



Name _____

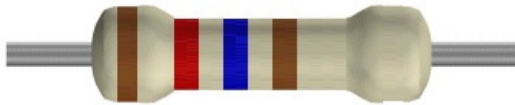
Use _____



Name _____

Use _____

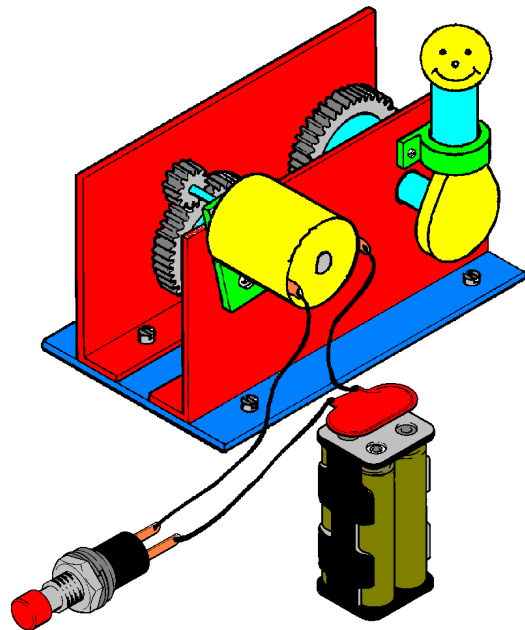
(b) Identify the electronic component shown and explain the function of the coloured bands on the body of the component.



Name _____

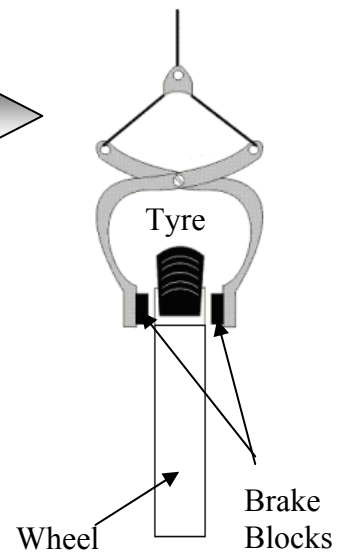
Function of coloured bands _____

(c) Shown opposite is an electronic toy for a small child. In the space provided describe briefly how the toy works.



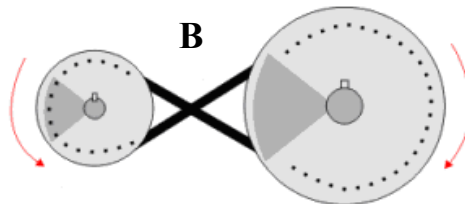
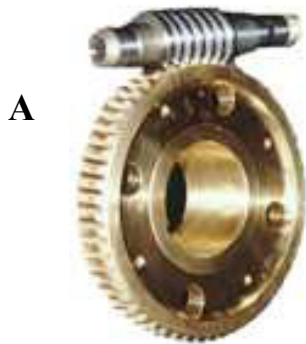
Description _____

(a) The diagrams show a braking mechanism commonly found on bicycles. Explain how the mechanism works.



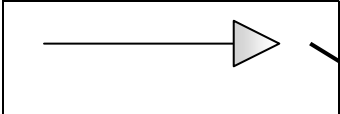
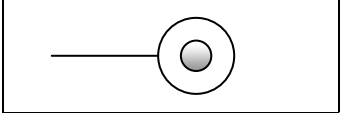
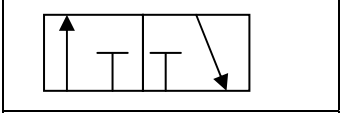
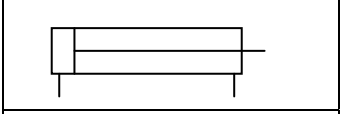
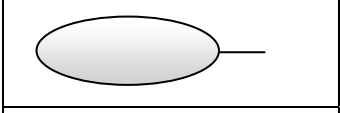
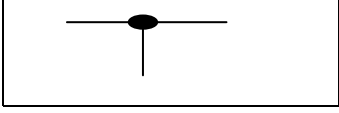
Explanation _____

(b) Identify the **three** mechanisms A, B and C shown below and state **one** use of each.

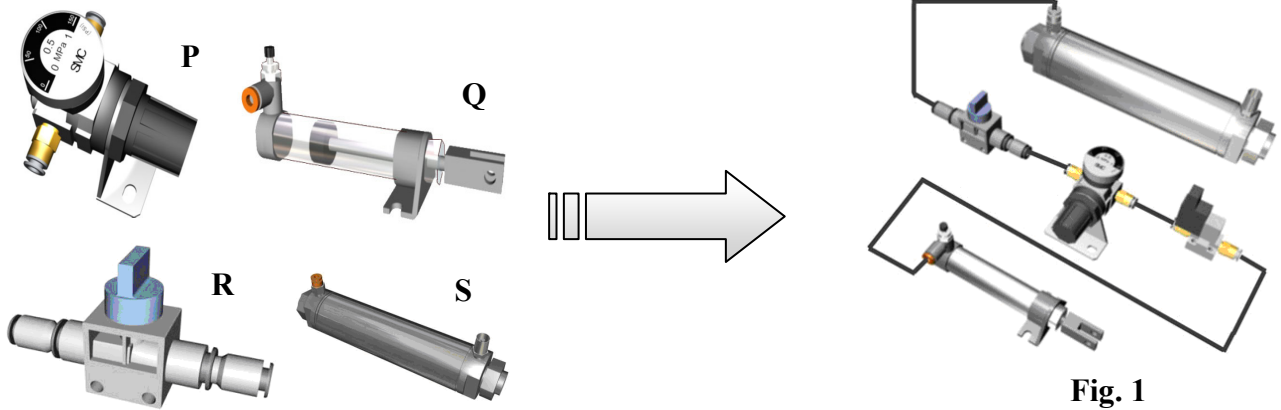


	Name	Use
Mechanism A		
Mechanism B		
Mechanism C		

(a) Match the pneumatic symbols on the left with the correct name on the right. The first one is completed as an example.

			Connected Pipes
			3/2 Port Valve
			Reservoir
			Exhaust Air
			Main Air Supply
			Double Acting Cylinder

(b) The pneumatic components P, Q, R and S are shown below. These components are connected to form the pneumatic circuit shown in Fig. 1. Describe the operation of the pneumatic circuit.



Description _____

(c) Pneumatic systems use compressed air to perform a variety of tasks. Name **two** areas where pneumatic systems are used.

1. _____ 2. _____

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For Examiners use only		
Question	Mark	Total
Section 1	X	X
1	X	
2	X	
3	X	
Section 2	X	X
4		
5		
6		
7 (a)		
7 (b)		
7 (c)		
7 (d)		
7 (e)		
Total	X	