Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied, 2011

Vocational Specialism – Engineering
(240 marks)

Monday, 13 June, 2011

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.

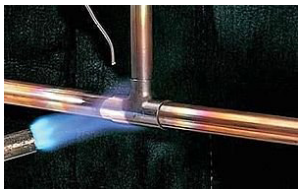
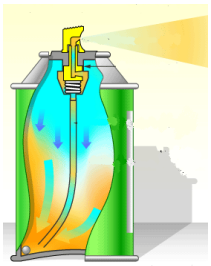
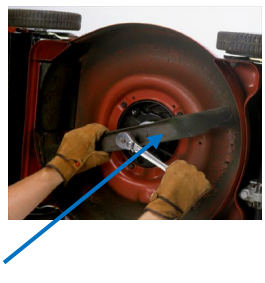
For the Superintendent only	*For the Examiner only*	
Centre Stamp	1. Total of end of page totals	
	2. Aggregate total of all disallowed questions	
	3. Total mark awarded (1 minus 2)	
	4. Bonus mark for answering through Irish (if applicable)	
	5. Total mark awarded if Irish Bonus applies (3 plus 4)	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

Section 1 (90 Marks)

Answer **all three** questions

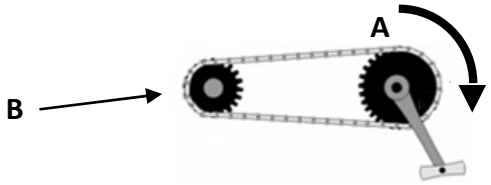
Section 1 **Q1.** **45 marks**

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

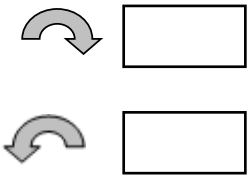
QUESTION	ANSWER
(a) Identify the joining process shown and give a practical example of where it could be used. 	Joining process_____ Use_____ _____
(b) State a reason why vice clamps are being used to hold the metal shown. 	Reason _____ _____
(c) Name a suitable material to make the car wheel shown. 	Name of material_____ _____
(d) Outline **one** safety precaution that should be observed when using aerosol paint. 	Safety precaution _____ _____ _____
(e) Suggest a suitable material that could be used in making a lawnmower blade and give a reason for its suitability. 	Material _____ Reason _____ _____

QUESTION	ANSWER

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



Tick the correct box to indicate direction of gear **B**.



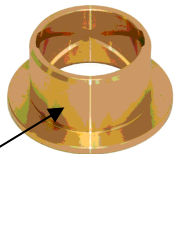
(g) Identify the special nut shown and state **one** advantage for its use.

Name_____

Advantage_____

_____

(h) Tick the correct box opposite, to indicate the two metals used to make the alloy brass.



Tin + Lead ☐

Copper + Zinc ☐

Copper + Lead ☐

(i) Suggest a suitable material that could be used to manufacture the seat of the go-kart shown.

Suitable material

_____

(j) Name the clip shown and give a suitable use for it.

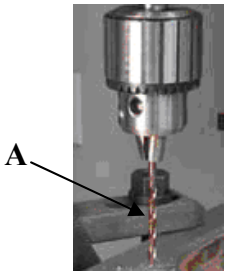
Name_____

Use_____

_____

QUESTION	ANSWER

(k) Name a suitable material used to make the drill bit **A** shown, and give **one** reason for your choice of material.



Material _____

Reason _____

_____

(l) Please tick the correct type of plastic that could be used to allow the waste-water pipe shown to be bent using heat.

Thermosetting plastic ☐

Thermoplastic ☐

(m) Identify the joining technique used to join the light sheet-metals shown.

Joining technique

_____

_____

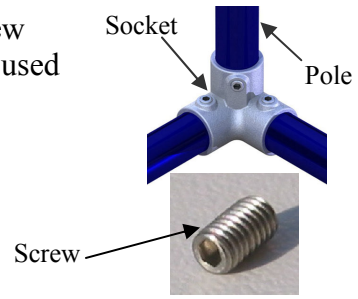
(n) Name the tool shown and state a suitable use for it.

Name _____

Use _____

_____

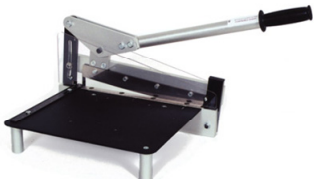
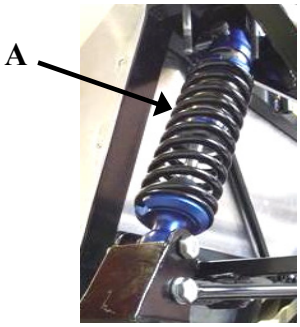
(o) Identify the screw shown which is used to hold the pole securely in the socket.



Name of screw

_____

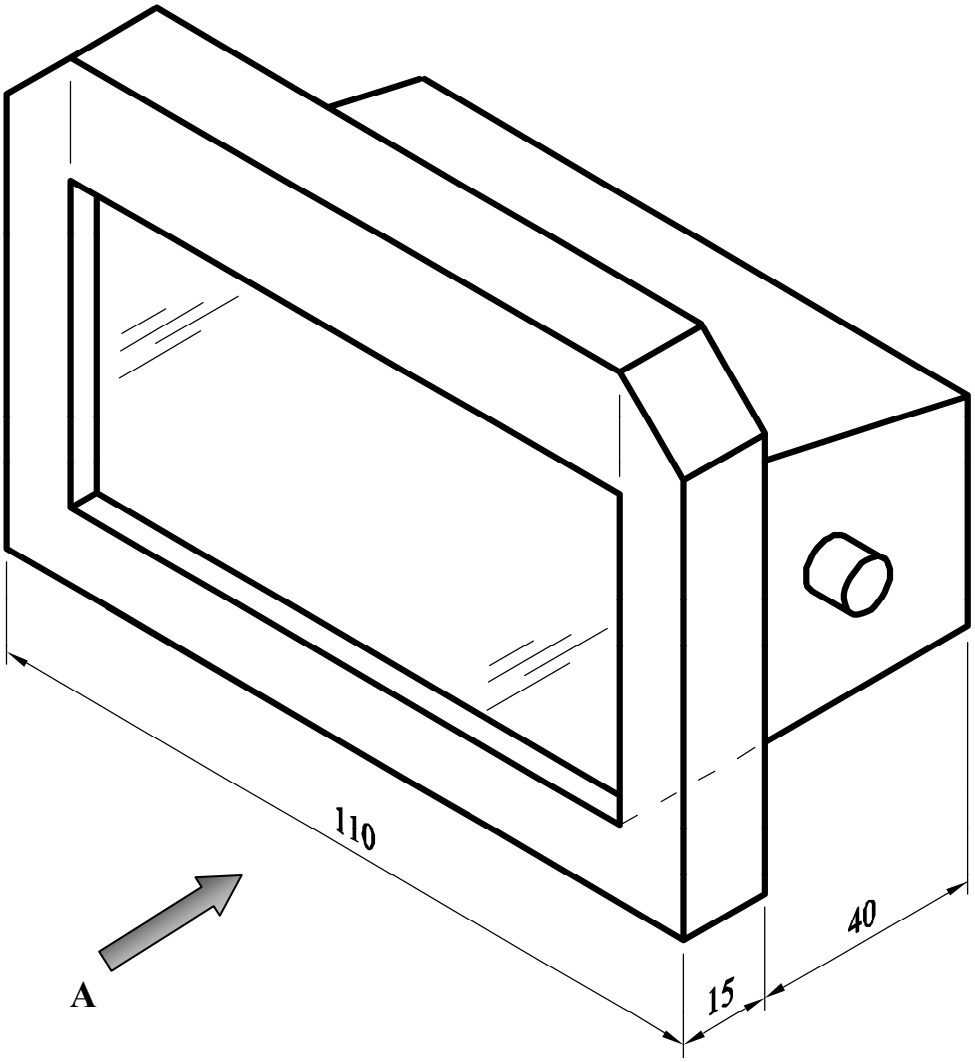
_____

QUESTION	ANSWER
(p) Choose a suitable material for the casing of the Satellite Navigation Unit (GPS) shown and give a reason for your choice of material. 	Suitable material_____ Reason_____ _____
(q) Name the tool shown below and state a use for it. 	Name of tool _____ Use _____ _____ _____
(r) Identify **one** safety precaution that should be observed when using the table shears shown. 	Safety precaution_____ _____ _____
(s) Name the piece of equipment shown and state a suitable use for it. 	Name_____ Use_____ _____
(t) Identify the mechanism marked **A** and give a use for it in the engineering world. 	Name _____ Use _____ _____

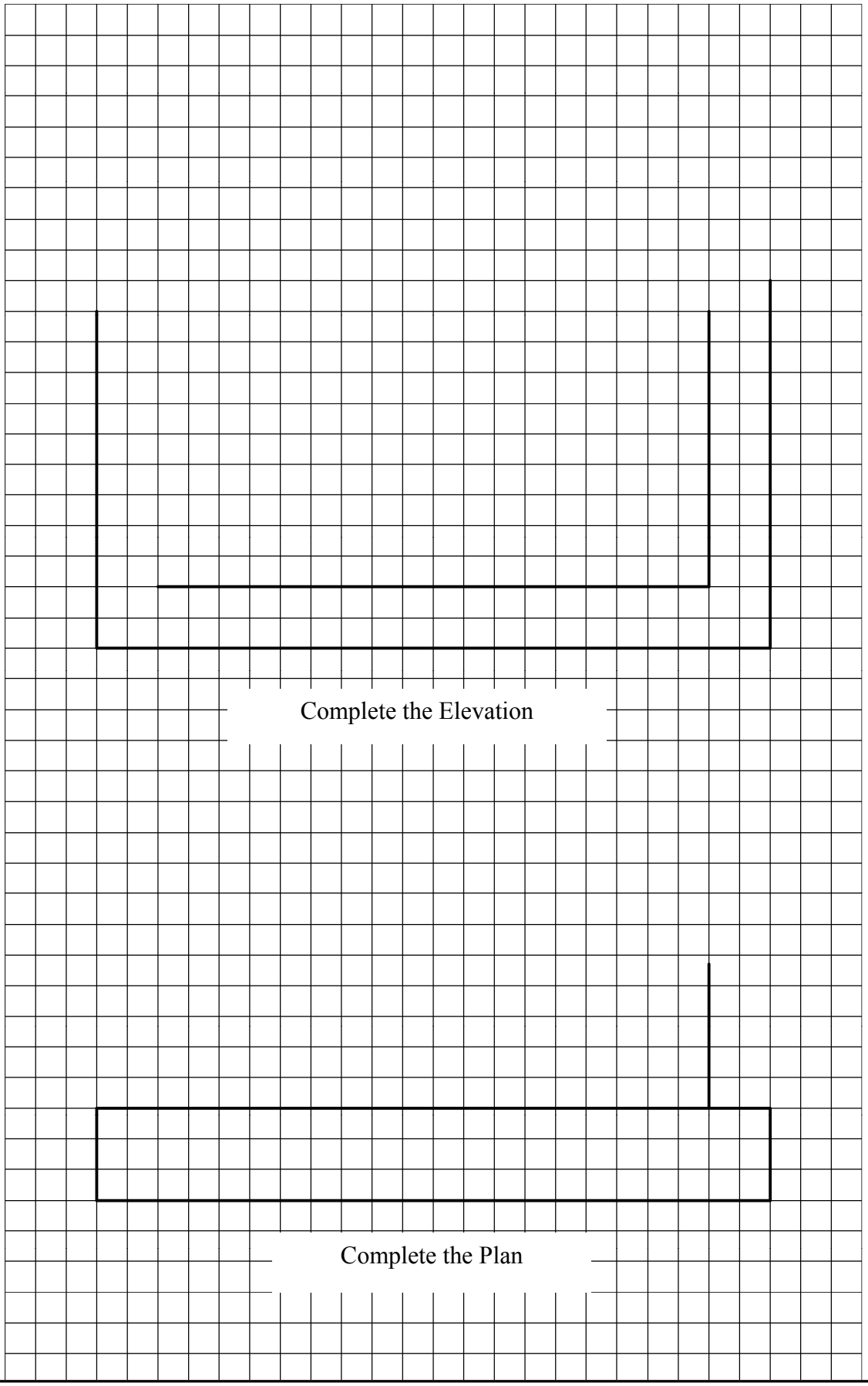
A pictorial view of an outdoor light is shown below.
Draw the following **two** views of the outdoor light on the grid paper opposite:

(a) A front elevation in the direction of arrow **A**.

(b) A plan projected from view **(a)**.



Note: Each grid square represents 5 mm.



(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 engineering equipment

_____

Safety Precaution 1

_____

_____

Safety Precaution 2

_____

_____

B - Name of engineering equipment

_____

Safety Precaution 1

_____

_____

Safety Precaution 2

_____

_____

(b) The diagram shows a spot welder which is commonly used to join sheet metal. Identify **two** safety precautions that should be observed by students when using a spot welder.

Safety Precaution 1_____

_____

Safety Precaution 2_____

_____

(c) Describe **any two** safety features on the grinding machine shown below.

Safety Feature 1 _____

_____

_____

_____

_____

Safety Feature 2 _____

_____

_____

_____

_____

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

Safety precaution_____

_____

(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**_____

_____

Section 2 (150 Marks)
Answer **any three** questions

Section 2 **Q4.** **50 marks**

(a) Design, in the spaces provided, a suitable support bracket to enable the bicycle shown, to be transported on the back of the camper van.

The design should clearly show **each** of the following:

(i) A method for attaching the support bracket to the camper van;
(ii) A method to ensure the bicycle is held securely in the support bracket.

Draw in **Grid A at least two** sketches, of different ideas you considered for the design of the support bracket.

Draw in **Grid B** a sketch of the **final solution** for the support bracket.

At least **two sketches** for the support bracket should be drawn below in **Grid A**.

Grid A - IDEAS

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

Grid B – FINAL SOLUTION

(b) **(i)** Suggest a suitable material for manufacturing the frame of the baby stroller.

_____

(ii) Give a reason for your choice of material.

_____

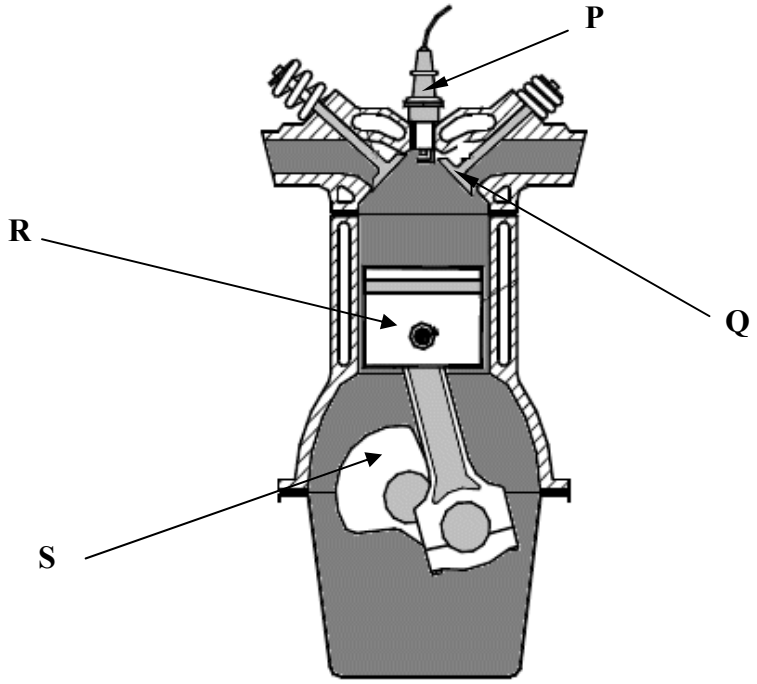
_____

(iii) Outline **one** reason why the wheels on the front of the stroller are smaller than those on the back.

_____

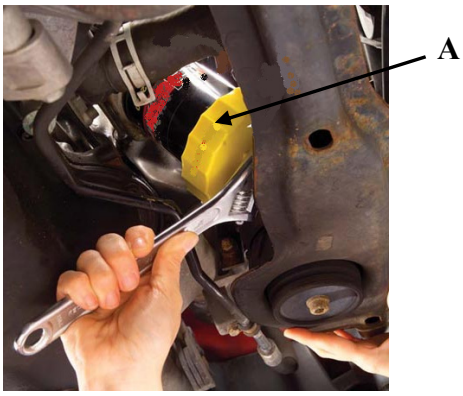
_____

(a) A cross-sectional diagram of a four-stroke engine is shown below.
Identify 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 part **A** being removed by the mechanic in the diagram opposite and state the function of this part.



Name _____

Function _____

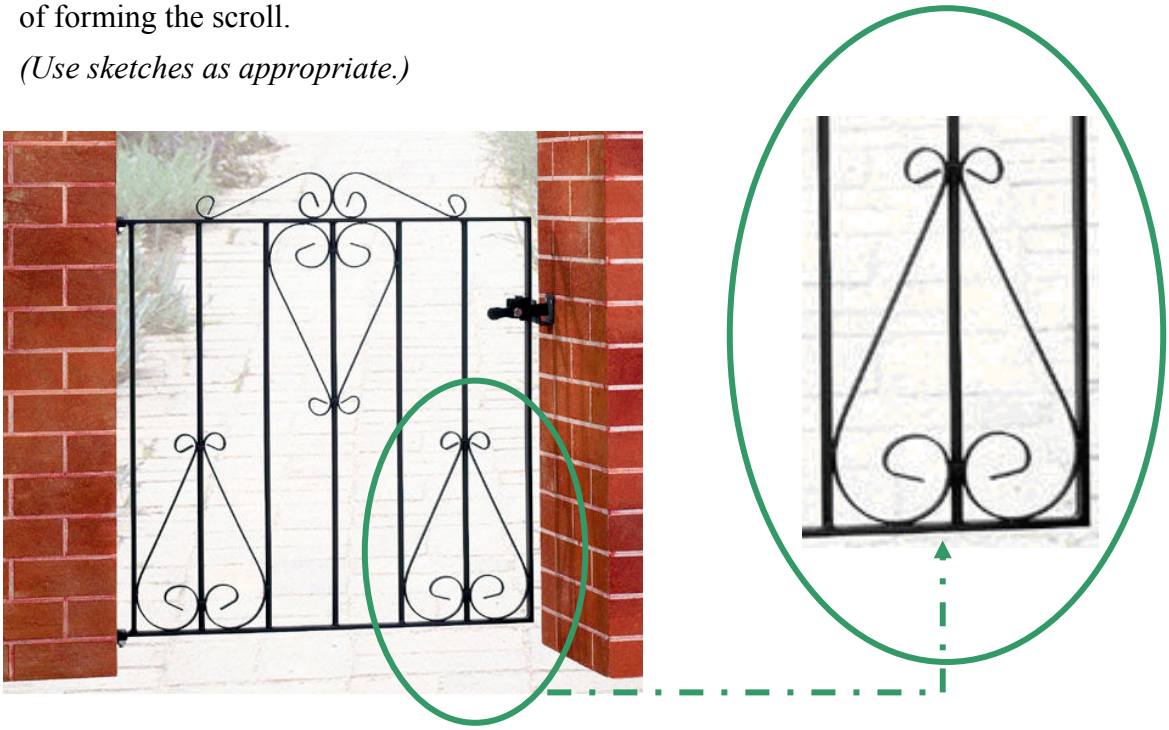
_____

(c) Some important parts of a car engine are shown below. Identify the parts labelled **U**, **V**, **W** and **X** and state the function of each.

Part	Name of Part	Function
U		
V		
W		
X		

(a) Describe briefly, in the spaces below, **any three** stages in the production of the decorative scroll, in the gate shown. Your description can refer to a hot **or** a cold treatment method of forming the scroll.

(Use sketches as appropriate.)



Stage 1 _____

_____

_____

_____

Stage 2 _____

_____

_____

_____

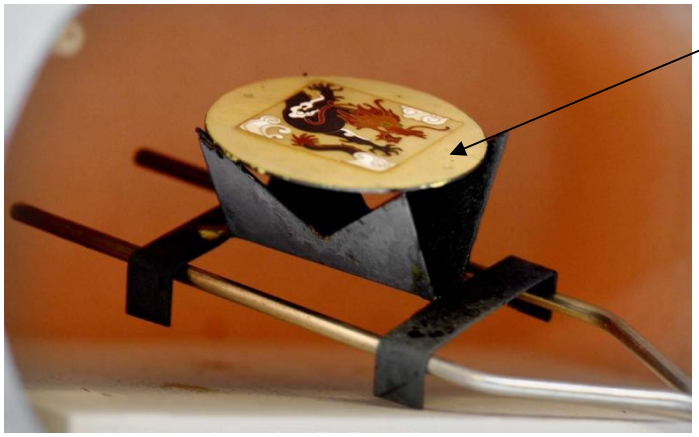
Stage 3 _____

_____

_____

_____

(b) The badge shown below is being decorated using an enamelling process. Describe briefly, in the spaces below, **any four** key stages used to produce the enamelled design on the badge. *(Use sketches as appropriate.)*



Stage 1 _____

_____

_____

Stage 2 _____

_____

_____

Stage 3 _____

_____

_____

Stage 4 _____

_____

_____

(c) State **two** safety precautions to be observed during the enamelling process.

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)

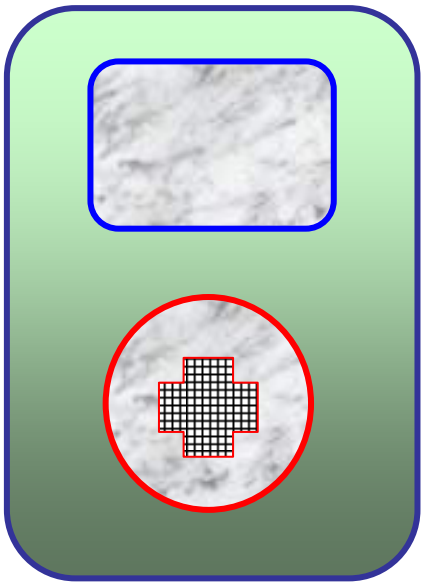
Topic (b) – Electricity

Topic (c) – Electronics

Topic (d) – Mechanisms

Topic (e) – Pneumatics

(a) A CAD drawing of an MP3 player is shown below. List **any four** CAD commands necessary to produce the drawing.



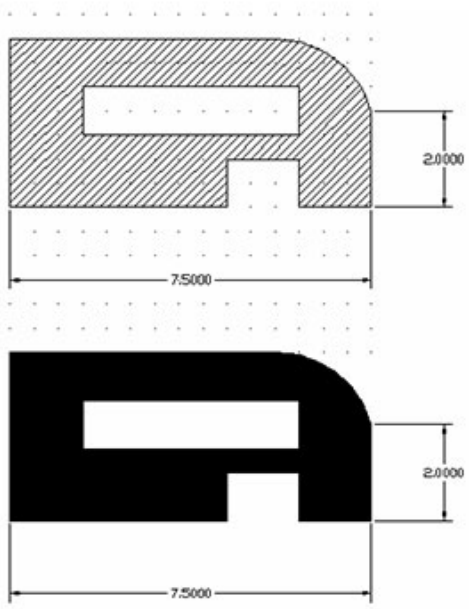
Command 1_____

Command 2_____

Command 3_____

Command 4_____

(b) The drawing below is produced by a CAD package. Explain the procedure involved in hatching an area on a CAD drawing.



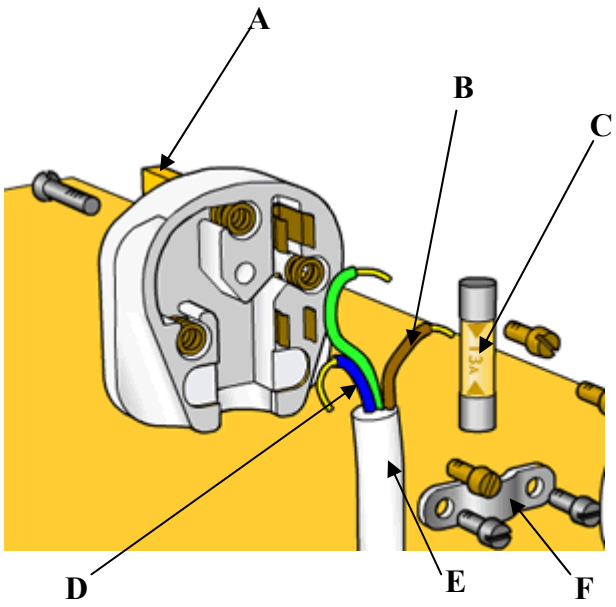
Procedure_____

_____

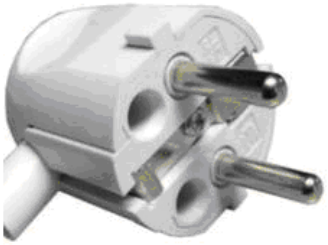
_____

(a) Match **each** of the labelled electrical parts with the correct name in the table. The first one is completed as an example.

A	**Neutral Wire**
B	**Cable**
C	**Live Wire**
D	**Earth Pin**
E	**Fuse**
F	**Cable Clamp**



(b) Two different plugs are shown below. Explain why some electrical devices have a three-pin plug while other devices have a two-pin plug.



Explanation _____

_____

_____

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

Name _____

Use _____

_____

Name _____

Use _____

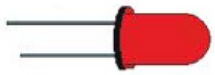
_____

Name _____

Use _____

_____

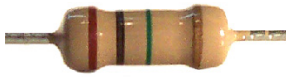
(a) Name and state a suitable use for **each** of the components shown below.



Name _____

Use _____

_____



Name _____

Use _____

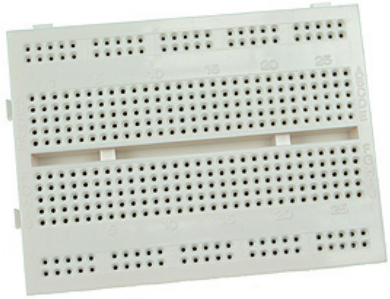
_____

Name _____

Use _____

_____

(b) Identify the electronic equipment shown and explain its function.

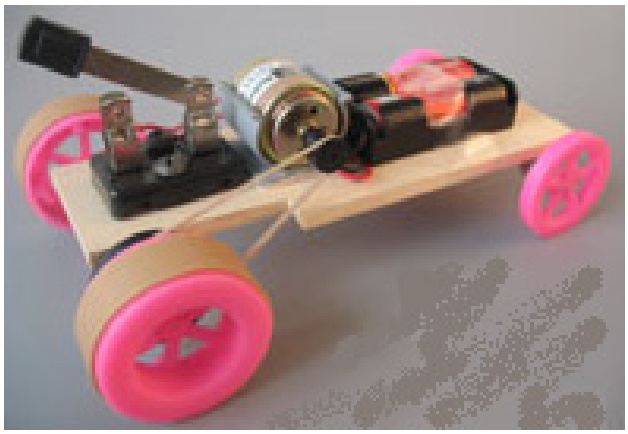


Name _____

Function _____

_____

(c) An electronic toy buggy is shown below. Describe briefly, in the space provided, how the toy buggy works.



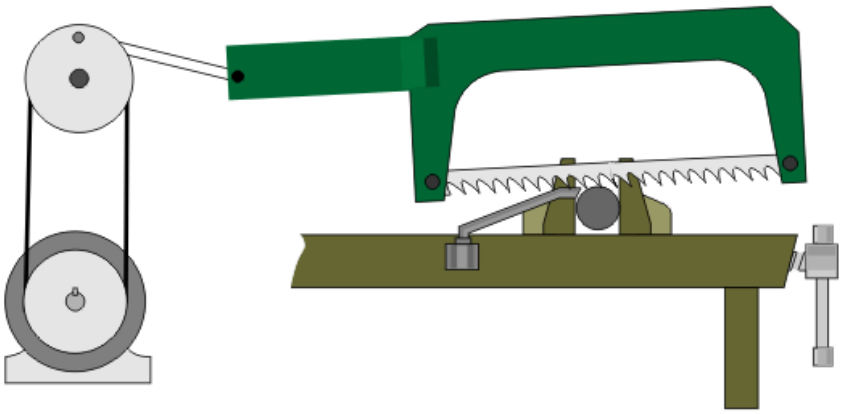
Description _____

_____

_____

_____

(a) The diagram below shows a mechanism to operate a power saw. Explain how the mechanism works.



Explanation_____

_____

_____

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

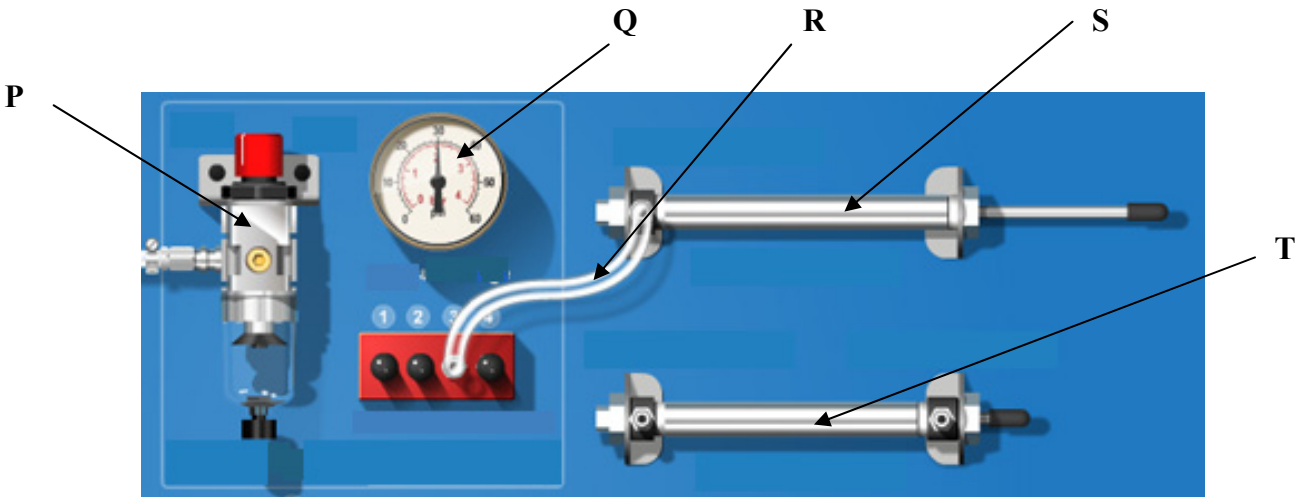
A

B

C

	Name	**Use**
Mechanism **A**		
Mechanism **B**		
Mechanism **C**		

(a) Identify the pneumatic components shown below and state the function of **each**.



	Name	Function
P		
Q		
R		
S		
T		

(b) Pneumatic systems require safe work-practices. Give **two** examples of specific safety precautions to be observed when working with pneumatic systems.

1 _____

_____

2 _____

_____

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

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