Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied, 2014

Vocational Specialism – Engineering
(240 marks)

Monday, 9 June

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.	

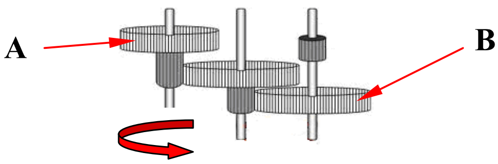
Section 1 **Q1.** **45 marks**

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

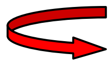
QUESTION	ANSWER
(a) Identify the tool shown below and give a suitable use for it in the engineering room. 	Name: ________________ Use: ________________ ________________
(b) State a suitable material for manufacturing the roll bar, marked **A**, on the tractor shown. 	Suitable material: ________________ ________________
(c) Name the engineering item shown and give a suitable use for it. 	Name: ________________ Use: ________________ ________________
(d) Identify a suitable material to manufacture the kitchen hinge, marked **A**, shown opposite.  **A**	Suitable material: ________________ ________________
(e) The tool shown opposite is often found in a plumber's tool kit. Give a relevant use for this tool. 	Relevant use: ________________ ________________ ________________

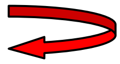
QUESTION	ANSWER

(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 show the direction of gear **B**.

 ☐

 ☐

(g) Identify the cutting tool marked **A** and give **one** safety precaution that should be observed when using this tool.

Name: ______________________________

Safety precaution: ______________________________

____

(h) Name the special tool shown opposite and give a suitable use for it in the engineering room.

Name: ______________________________

Use: ______________________________

____

(i) Suggest a suitable material that could be used to manufacture the casing marked **A**, on the computer processor shown opposite.

Suitable material: ______________________________

____

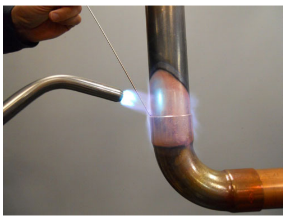
(j) Tick the correct box to indicate the **two** metals used to make the alloy solder.

Tin and Lead ☐

Copper and Zinc ☐

Copper and Tin ☐

QUESTION	ANSWER
(k) Name the tool shown below and state **one** use for it. 	Name: ____________________ Use: ____________________ ____________________
(l) Suggest a suitable metal used to manufacture the electrical wire core marked **A**. Give **one** reason for your choice of metal.  **A**	Metal: ____________________ Reason: ____________________ ____________________
(m) Identify the marking-out tool shown opposite and give a suitable use for it during the marking-out process. 	Name: ____________________ Use: ____________________ ____________________
(n) Name a suitable material used to manufacture the blade of the lawn mower, marked **A**. Give a reason for your choice of material.  **A**	Material: ____________________ Reason: ____________________ ____________________
(o) Identify the bolt shown and state **one** advantage of using this type of bolt. 	Name: ____________________ Advantage: ____________________ ____________________

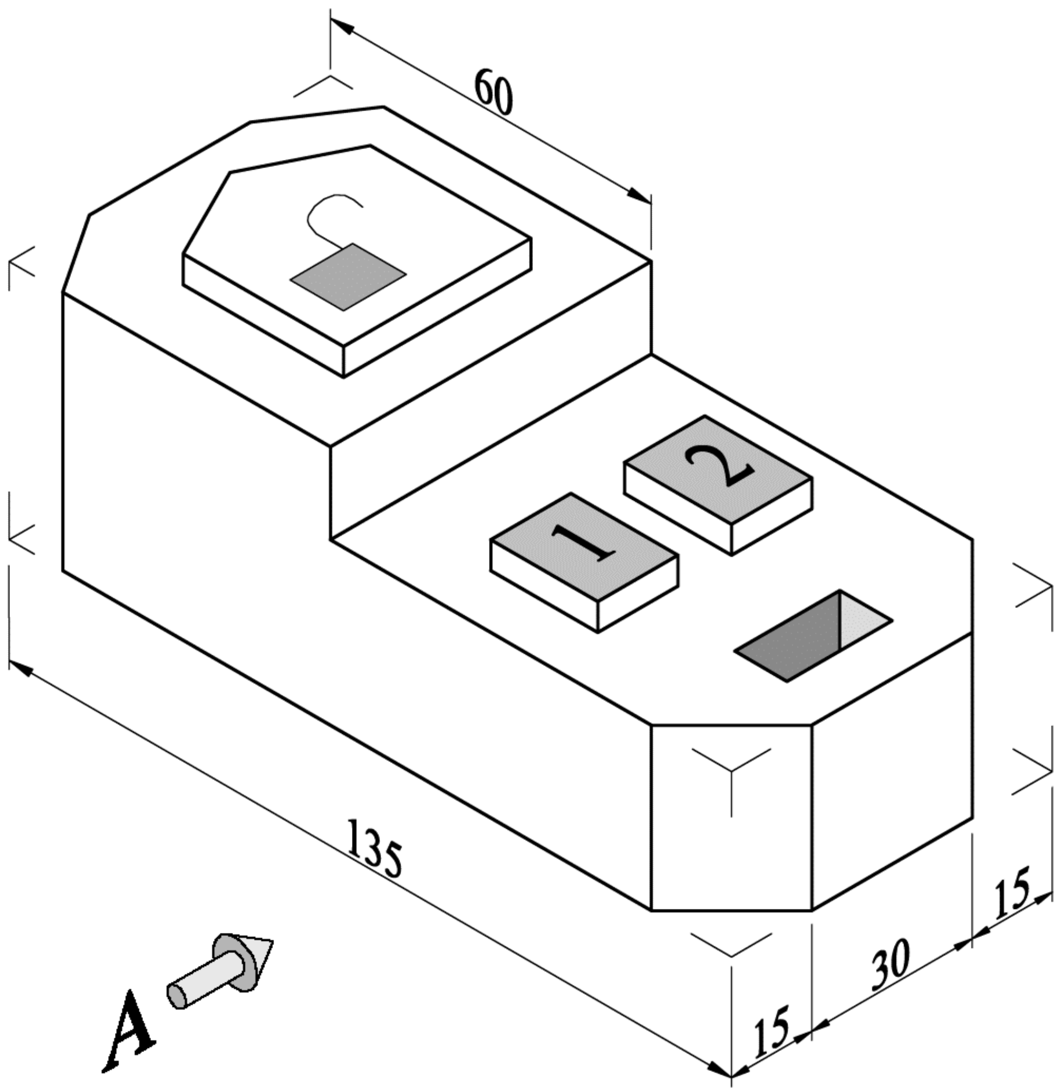
QUESTION	ANSWER
(p) Outline **one** use of the engineering equipment shown opposite and state **one** safety precaution to be observed when using this equipment. 	Use: ______________________ Safety precaution: ______________ ______________________
(q) Name and give a use for the tool shown below. 	Name: ______________________ Use: ______________________ ______________________
(r) List **any three** items or equipment required to carry out the joining process shown. 	1. ______________________ 2. ______________________ 3. ______________________
(s) Identify the equipment below and give a suitable use for this equipment in the engineering room. 	Name: ______________________ Use: ______________________ ______________________
(t) Suggest a suitable use for the jubilee clip shown opposite. 	Suitable use: ______________________ ______________________ ______________________

Section 1 **Q2.** **25 marks**

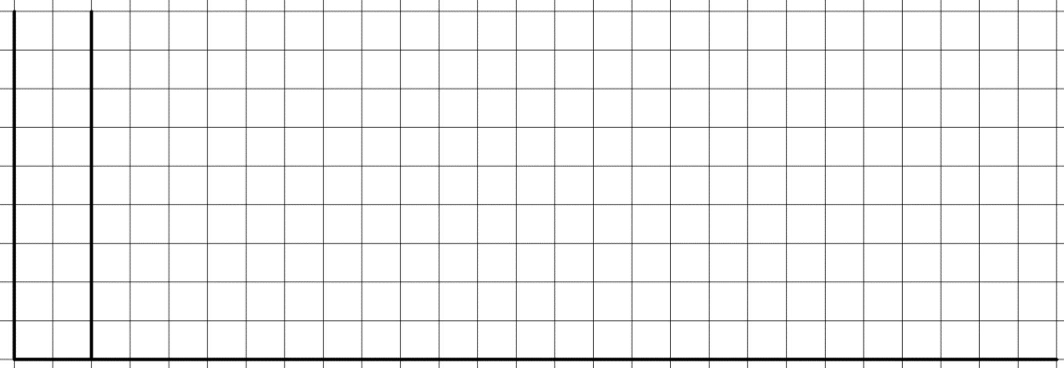
A pictorial view of a remote control unit for an electric gate is shown below.
Draw the following **two** views of the remote control unit on the grid paper opposite:

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

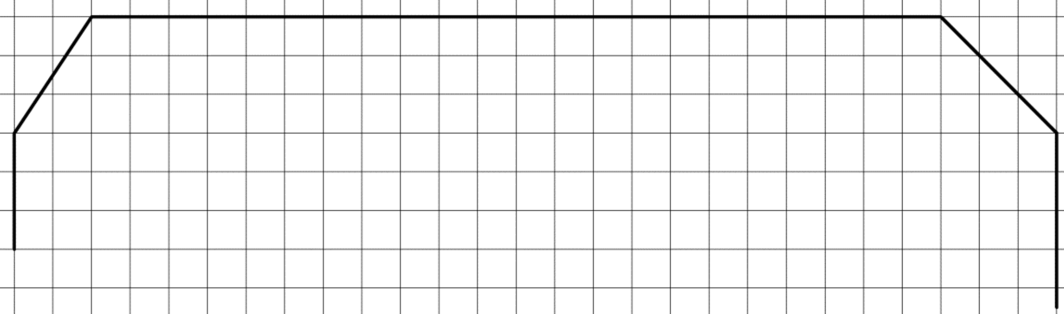
(b) A plan projected from view **(a)**.



Note: Each grid square represents 5 mm.



Complete the Elevation



Complete the Plan

Section 1 **Q3.** **20 marks**

(a) Name the **two** engineering processes shown at **A** and **B** below. State **two** examples of safety precautions being observed in **each** case.

A - Name of engineering process:

____

Safety Precaution 1:

____

____

Safety Precaution 2:

____

____

B - Name of engineering process:

____

Safety Precaution 1:

____

____

Safety Precaution 2:

____

____

(b) The diagram shows a school engineering workshop. Identify **two** safety precautions that should be observed when working in this type of classroom environment.

Safety Precaution 1:______________________________

____

Safety Precaution 2:______________________________

____

(c) Describe **any two** safety precautions to be observed when using the electrical jigsaw shown.

Safety Precaution 1: ______________________________

____

____

____

____

Safety Precaution 2: ______________________________

____

____

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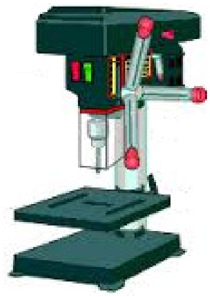
____

(d) State **one** safety feature required for the safe operation of the electric bench drill shown.



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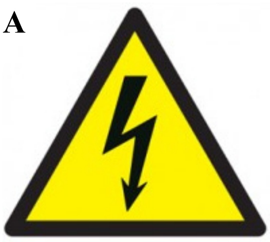
(e) The safety symbols below may be found in an engineering workshop. Give a brief explanation for **each** of the symbols shown.

A



B

Symbol A: ______________________

____

____

Symbol B: ______________________

____

____

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

(a) Design, in the spaces provided, a suitable bracket for attaching the shower head to the back wall of the shower unit shown.

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

(i) A method to enable the bracket to be attached to the back wall of the shower unit;
(ii) A method to enable the shower head to be attached to the bracket.

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

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

At least **two sketches** of ideas for the shower head bracket should be drawn below in **Grid A**.

Grid A - IDEAS

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

Grid B – **FINAL SOLUTION**

(b) A traditional watch is shown at **A** and a modern watch is shown at **B**. Outline **three** main differences in the design features of the two watches.

1.____

____

2.____

____

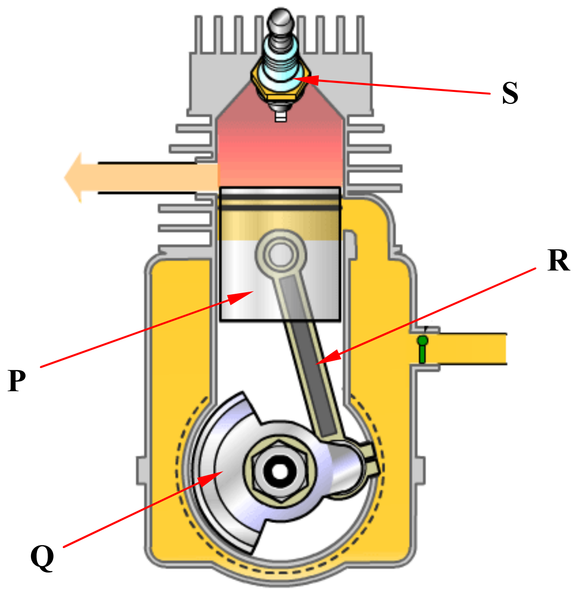
3.____

____

Watch A
(Traditional Watch)

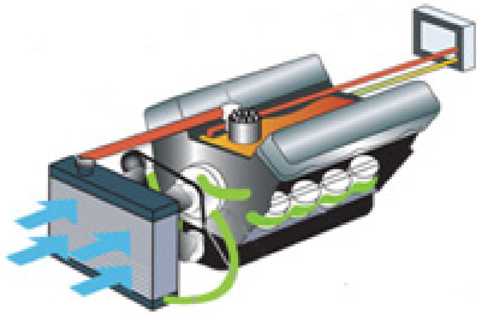
Watch B
(Modern Watch)

(a) A diagram of a model two-stroke engine suitable for a small motor bike 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) The system shown opposite is found in a modern car. Identify the system and describe its function in a modern car.

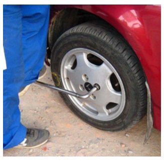


Name: ____

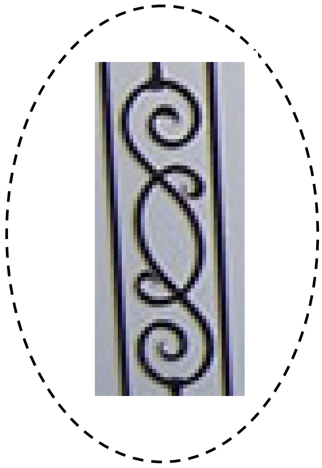
Function: ____

____

(c) Describe in the spaces below the key steps involved in changing the wheel on a car. The photographs shown may assist you in answering the question.

	Steps	Description
1		______________________
2		______________________
3		______________________
4		______________________
5		______________________

(a) Describe, in the spaces below, **any three** stages used to produce the decorative scroll in the safety rail 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 decorative piece, shown below, is produced using a range of decorative metalwork processes. Describe, in the spaces below, **any four** key stages used to produce this decorative piece.
(Use sketches as appropriate.)

Stage 1: ______________________________

____

____

Stage 2: ______________________________

____

____

Stage 3: ______________________________

____

____

Stage 4: ______________________________

____

____

(c) State **two** safety precautions to be observed during the production of the decorative piece shown in part **(b)** above.

Safety Precaution 1: ______________________________

____

Safety 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)

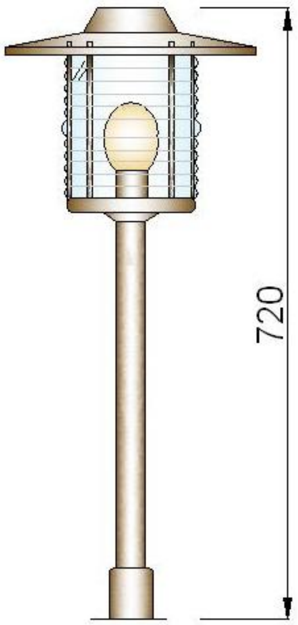
Topic (b) – Electricity

Topic (c) – Electronics

Topic (d) – Mechanisms

Topic (e) – Pneumatics.

(a) A simple CAD drawing of a garden light is shown below. List **any four** CAD commands necessary to produce the drawing below.



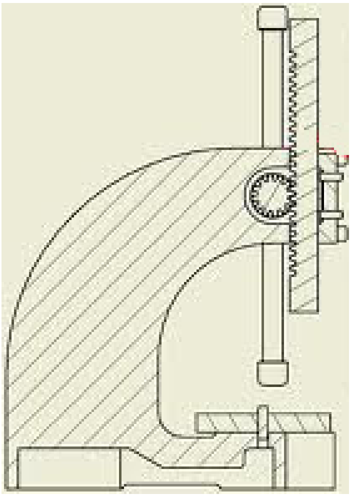
Command 1:________________________________

Command 2:________________________________

Command 3:________________________________

Command 4:________________________________

(b) The cross sectional view of an engineering component with some hatching is produced by a CAD package. Explain the procedure involved in hatching an area on a CAD drawing.



Procedure: ________________________________

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____

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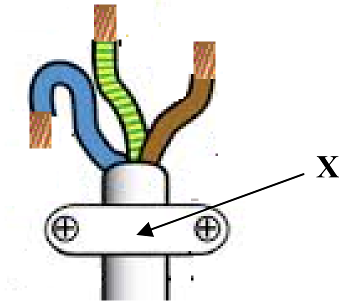
(a) The diagram below shows a typical three-pin plug.
Answer **all** questions in the spaces provided.



(i) Complete the table below to indicate how you would wire the three-pin plug correctly.

Connection	Colour of wire	Location of wire in plug above (P, Q or R)
Earth (E)		
Live (L)		
Neutral (N)		

(ii) What is the purpose of the fuse in a three-pin plug?

____

____

(iii) Describe the purpose of the part labelled **X** in the diagram above.

____

(iv) What is the voltage of a typical domestic electrical supply in Ireland?

____

(b) Name and state a suitable use for **each** of the items shown, which are used by an electrician.

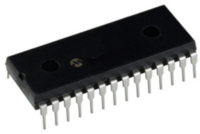
		
Name: ____________	Name: ____________	Name: ____________
Use: ____________	Use: ____________	Use: ____________
____________	____________	____________

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

Name: ____________________

Use: ____________________

____



Name: ____________________

Use: ____________________

____

Name: ____________________

Use: ____________________

____

(b) Identify the tool shown and explain its use in electronics.

Name:

____

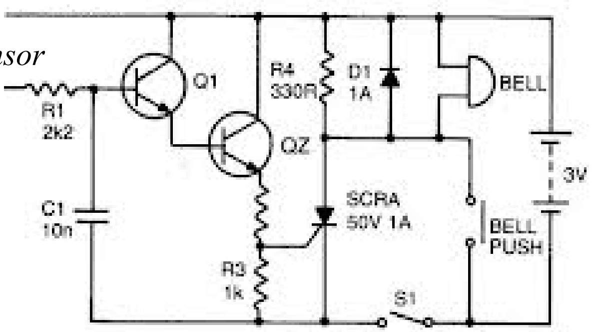
Use:

____

____

(c) An electronic circuit for a rain sensor alarm is shown below. Describe in the space provided how the electronic circuit works.

← *To Sensor*



Rain Sensor

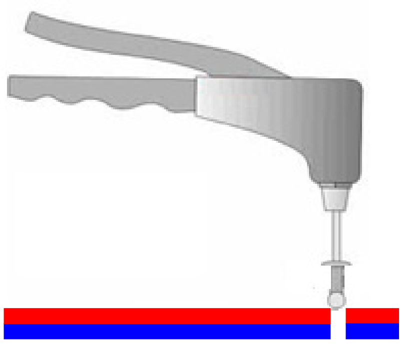
Description: ____

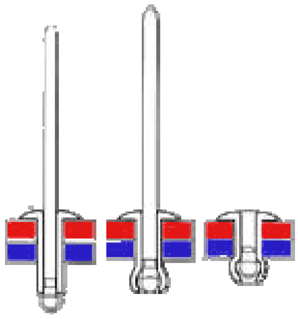
____

____

____

(a) The diagrams below show a hand-operated pop riveter. Explain how the pop riveter mechanism works.





Explanation: ____

____

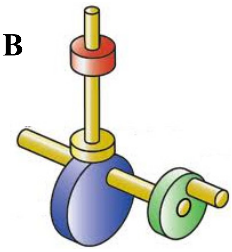
____

____

(b) Identify the mechanisms shown below and give a suitable use for **each** of them.

A

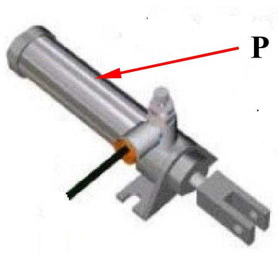
B

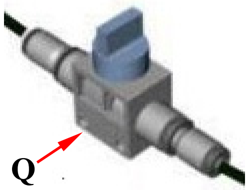


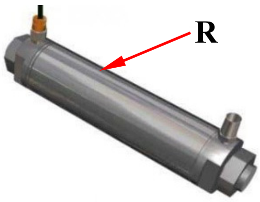
C

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

(a) Identify the pneumatic components **P**, **Q**, **R** and **S** shown below and state the function of **each**.

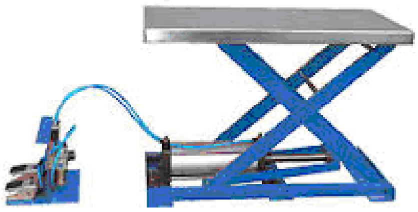






	Name	Function
P		
Q		
R		
S		

(b) A pneumatic lift table is shown opposite. Describe briefly the role of pneumatics in the operation of the lift table.



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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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