Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied, 2005

Vocational Specialism – Engineering
(240 marks)

Monday 13th June, 2005

Morning 9.30 a.m. – 11.00 a.m.

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.

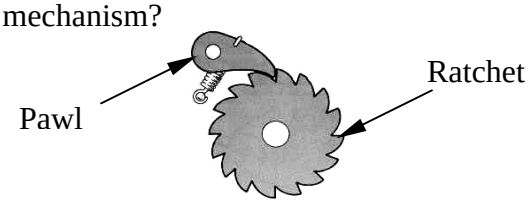
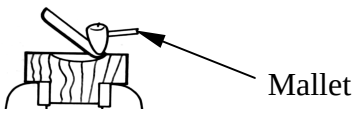
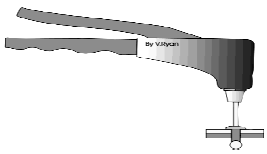
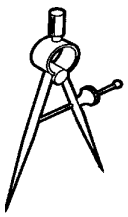
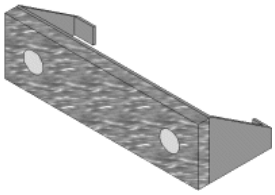
For the Superintendent only	*For the Examiner only*	
Centre Stamp	1. Total of end of page totals	
	2. Aggregate total of all disallowed questions	
	3. Total mark awarded (1 minus 2)	
	4. Bonus mark for answering through Irish (if applicable)	
	5. Total mark awarded if Irish Bonus (3 plus 4)	
	Note: The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

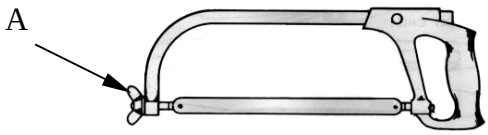
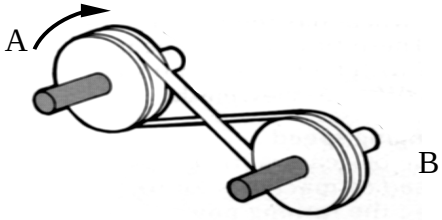
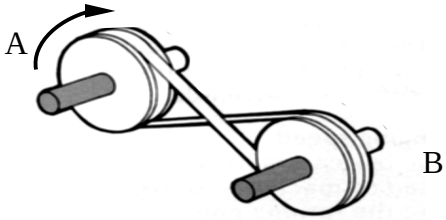
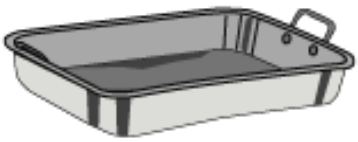
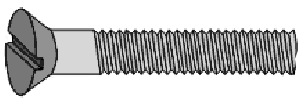
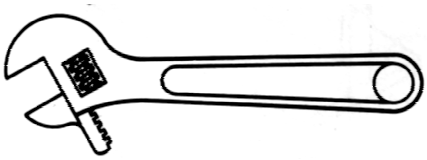
Section 1 (90 Marks)

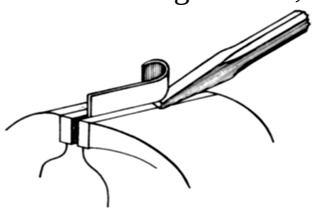
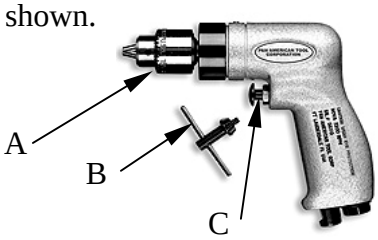
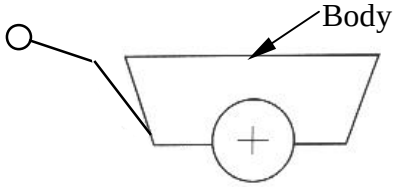
Answer all three questions

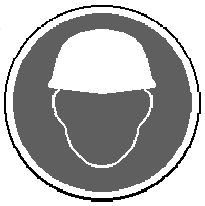
Section 1 **Q1.** **45 marks**

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

QUESTION	ANSWER
(a) What is the purpose of the pawl in this mechanism? 	Purpose_____ _____ _____
(b) Give one reason for using a wooden mallet when hollowing, as shown. 	Reason _____ _____ _____
(c) Name the type of fastener shown and give an example of where it is used. 	Name _____ Use_____
(d) Name the tool shown and state its use. 	Tool_____ Use _____ _____
(e) State the reason for using a soft jaw, as shown, in an engineers vice. 	Reason _____ _____ _____

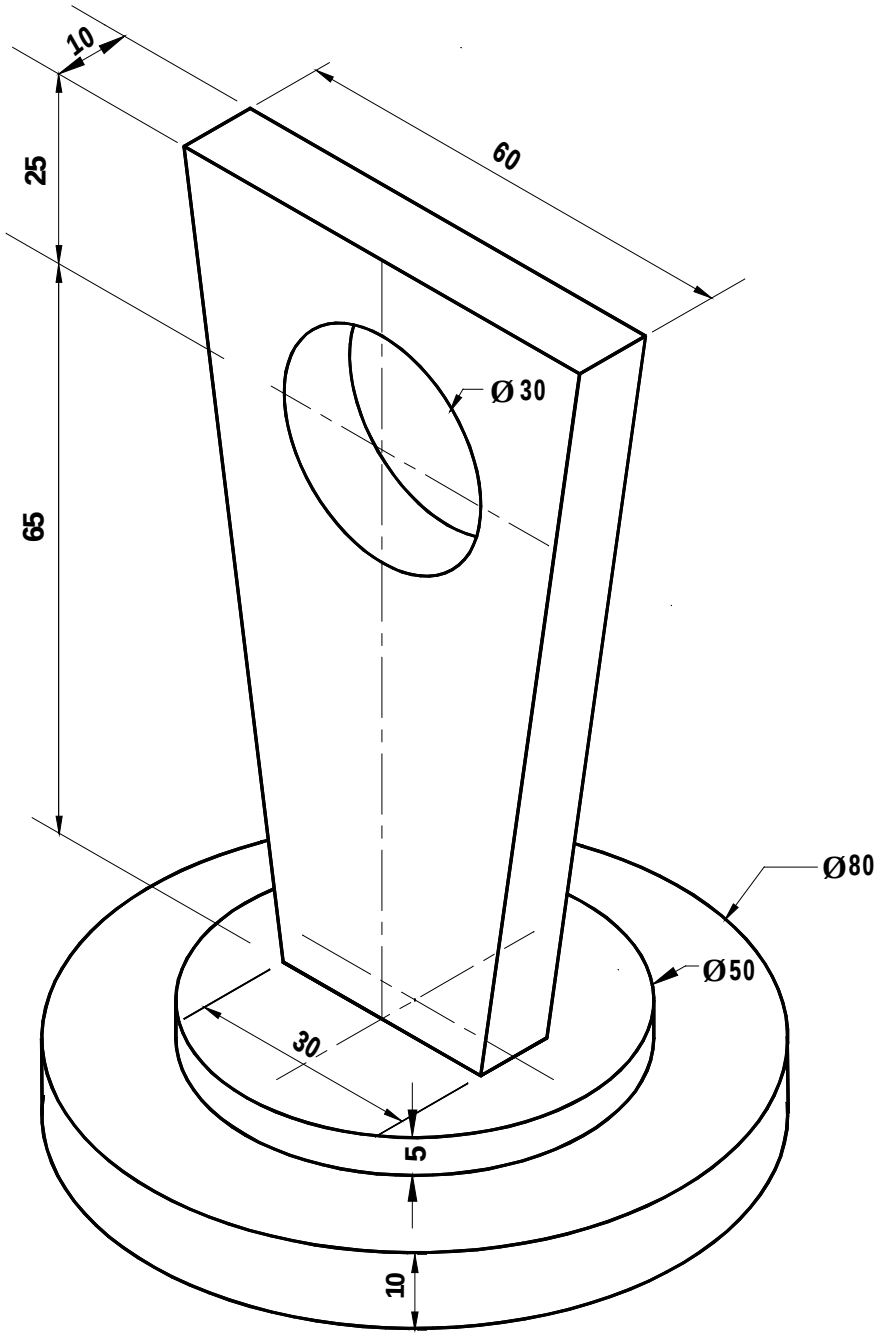
QUESTION	ANSWER
(f) What is the name and purpose of part 'A' on the hacksaw shown?  	Name _____ Purpose _____ _____
(g) If pulley 'A' rotates as shown, indicate with an arrow the direction of pulley 'B'.  	
(h) Name a suitable material to make a cooking pan, as shown, and state why this material is suitable. 	Material _____ Reason _____ _____
(i) Name the screw head shown, and give a reason for its use. 	Name _____ Use _____ _____
(j) Name the spanner shown and state where it is used. 	Name _____ Use _____ _____

QUESTION	ANSWER
(k) Give a reason why the handle of a pliers, as shown, is coated with plastic. 	Reason _____ _____ _____
(l) State **one** safety precaution that should be observed when using a chisel, as shown. 	Safety precaution _____ _____ _____
(m) Name the **three** parts of the drilling machine shown. 	A _____ B _____ C _____
(n) Name a suitable material for the body of the barrow shown and give a reason for this choice of material. 	Material _____ Reason _____ _____
(o) What is the purpose of the electrical device shown? 	Purpose _____ _____

QUESTION	ANSWER
(p) Give **one** use for the centre punch shown in this sketch. 	Use _____ _____ _____
(q) Name the tool shown and state its use. 	Name _____ Use _____ _____ _____
(r) What does each safety symbol shown below indicate? A  B 	Symbol 'A'_____ _____ Symbol 'B'_____ _____
(s) Give **one** advantage for using a cordless drill as shown. 	Advantage _____ _____ _____
(t) Name a suitable material used to make this cutlery tray and give a reason for the choice of this material. 	Material _____ Reason _____ _____ _____

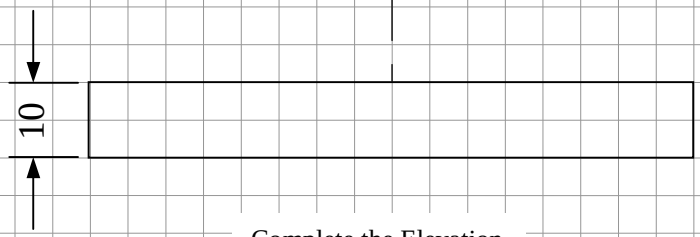
A pictorial view of a plaque is shown below.

(a) Complete the elevation and plan of the plaque on the grid paper opposite.

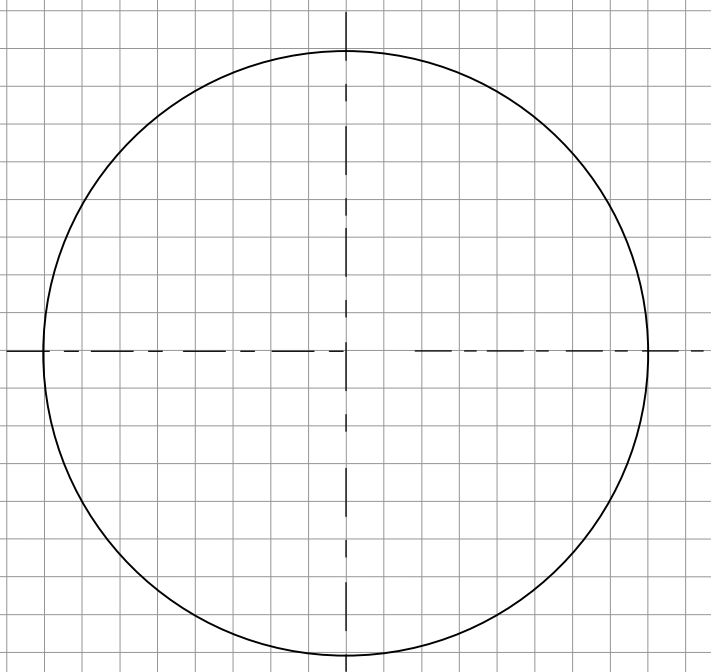


(b) One dimension is shown. Insert **three** other dimensions on your drawing.

Note: Each grid space is 5mm



Complete the Elevation



Complete the Plan

(a) Three common safety features seen in an Engineering room are shown. Name **two** safety features and give a reason for each. One example is already completed.

Safety feature	Reason
Example: Fire Alarm.	To indicate by an alarm bell, to all people in the building that a fire has broken out.
1. _____	_____
_____	_____
2. _____	_____

(b) The diagram shows a drilling machine in use. State **two** safety precautions that are being observed.

1. _____

_____

2. _____

_____

(c) When using oxy acetylene equipment identify **any two** dangers and describe the safety precautions that should be observed in each case.

Danger_____

_____

Safety precaution _____

_____

_____

Danger_____

_____

Safety precaution _____

_____

_____

(d) State **two** safety precautions that should be observed when working with hot metal in a forge.

Safety precaution 1 _____

_____

Safety precaution 2 _____

_____

(e) What does the safety symbol shown indicate and where would it be used?

Symbol indicates _____

_____

Used _____

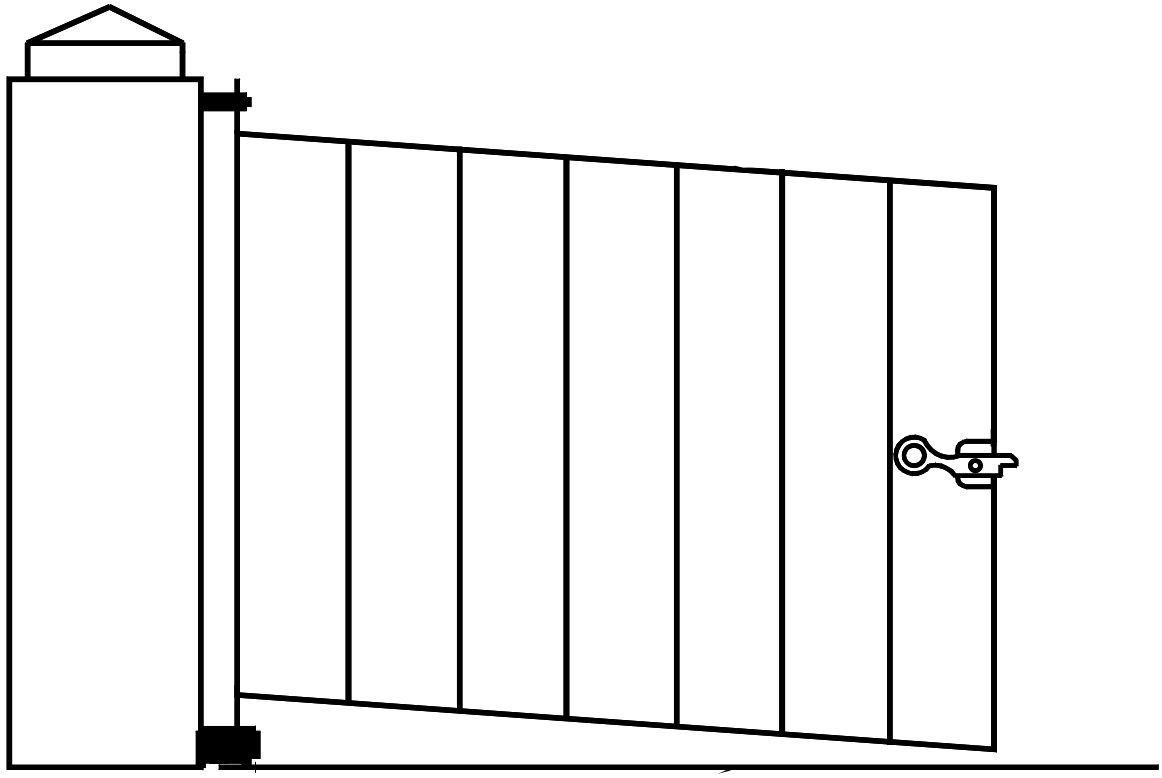
_____

Section 2 (150 Marks)

Answer any three questions

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

An entrance gate, which has sagged due to poor design, is shown below. It is made from steel bars that are welded together and is hung on a concrete pier.



(a) Outline **one** major design flaw with this gate.

Design flaw _____

_____

_____

_____

_____

_____

(b) (1) In the space provided, sketch a design modification for the given gate which will prevent it sagging.

(2) Suggest an additional design feature that will enhance the appearance of the gate.

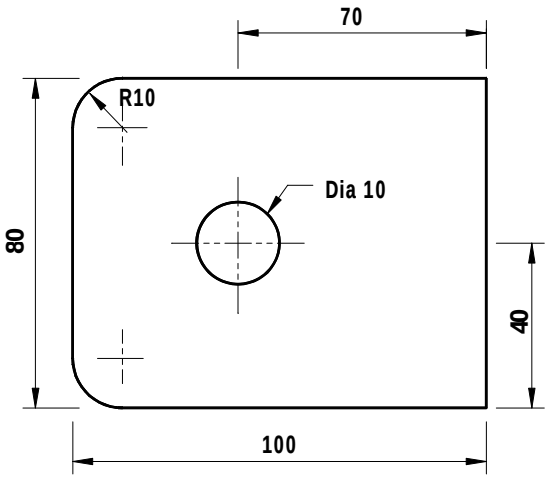
(c) You are required to mark out a hole of 10 mm diameter on the latch support bracket below.

(1) List **three** marking out tools you would use.

1 _____

2 _____

3 _____



(2) List **two** safety precautions that should be observed when drilling the hole.

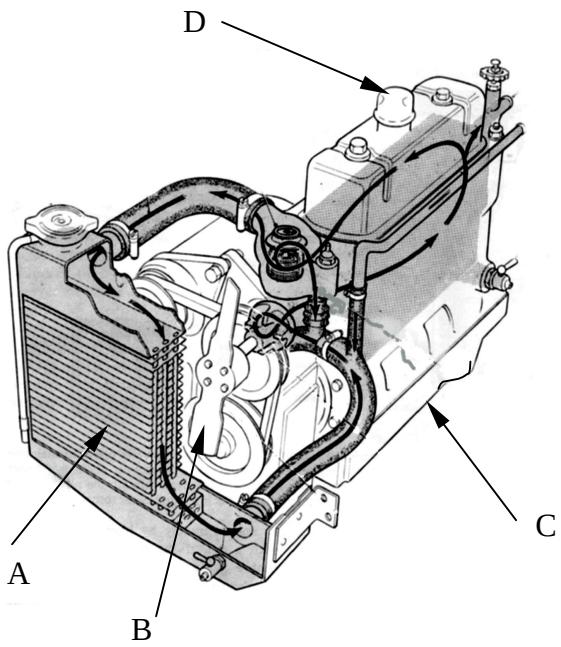
1 _____

2 _____

Section 2 **Q5.** **50 marks**

(a) Name and state the function of **any three** parts of the engine shown in the diagram.

Part	Name	Function
A		
B		
C		
D		



(b) Explain the function of **any four** of the following components. *(use sketches as appropriate).*

Inlet valve _____

_____

Spark plug _____

_____

Air filter _____

_____

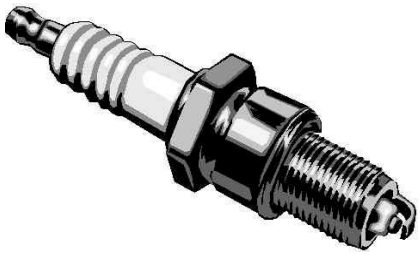
Carburettor _____

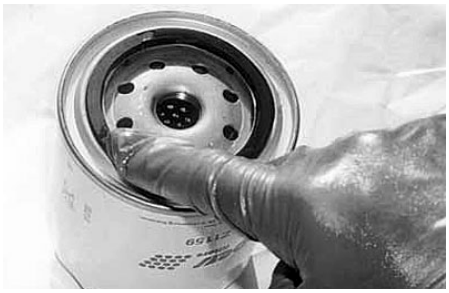
_____

Alternator _____

_____

(c) When servicing a motor car, you are required to change the spark plugs and oil filter. Describe **three** steps necessary to complete each procedure safely. *(use sketches as appropriate).*

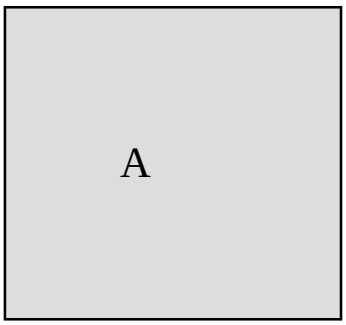




Changing the spark plugs	Changing the oil filter
Step 1_____	Step 1_____
_____	_____
_____	_____
_____	_____
Step 2_____	Step 2_____
_____	_____
_____	_____
_____	_____
Step 3 _____	Step 3 _____
_____	_____
_____	_____
_____	_____

Section 2 **Q6.** **50 marks**

(a) A copper bowl as shown, is made from the sheet 'A'. Describe briefly **any four** stages used to transform the shape from the original square sheet into the finished bowl. *(use sketches as appropriate).*



Square sheet of copper

Bowl

Stage 1 _____

_____

_____

Stage 2 _____

_____

_____

Stage 3 _____

_____

_____

Stage 4 _____

_____

_____

(b) A candleholder made from mild steel scrolls is shown below. Describe **four** stages you would use to make a single scroll. *(use sketches as appropriate).*

1 _____

_____

_____

2 _____

_____

_____

3 _____

_____

_____

4 _____

_____

(c) Describe **two** safety precautions you would take if the scrolls are made by hot forging.

1 _____

_____

2 _____

_____

Systems Module

(**Any two** topics comprise a full module)

Answer any two from the following five topics.

Topic (a) – Computer Aided Design (CAD)

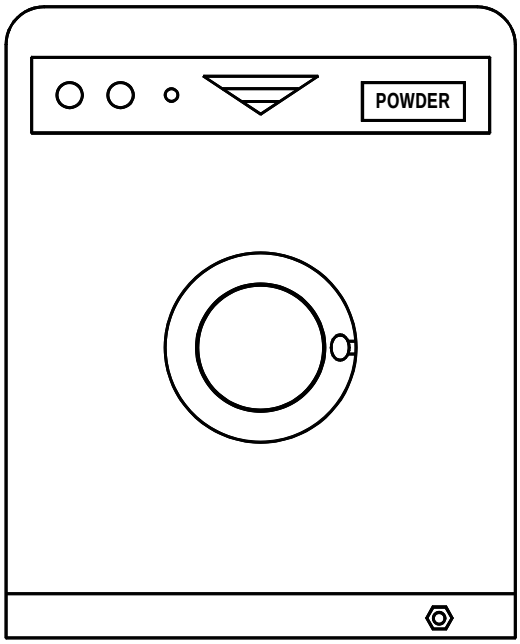
Topic (b) – Electricity

Topic (c) – Electronics

Topic (d) – Mechanisms

Topic (e) – Pneumatics

(a) A drawing of the front of a washing machine is shown. List any **five** CAD commands necessary to produce the drawing.



1 _____

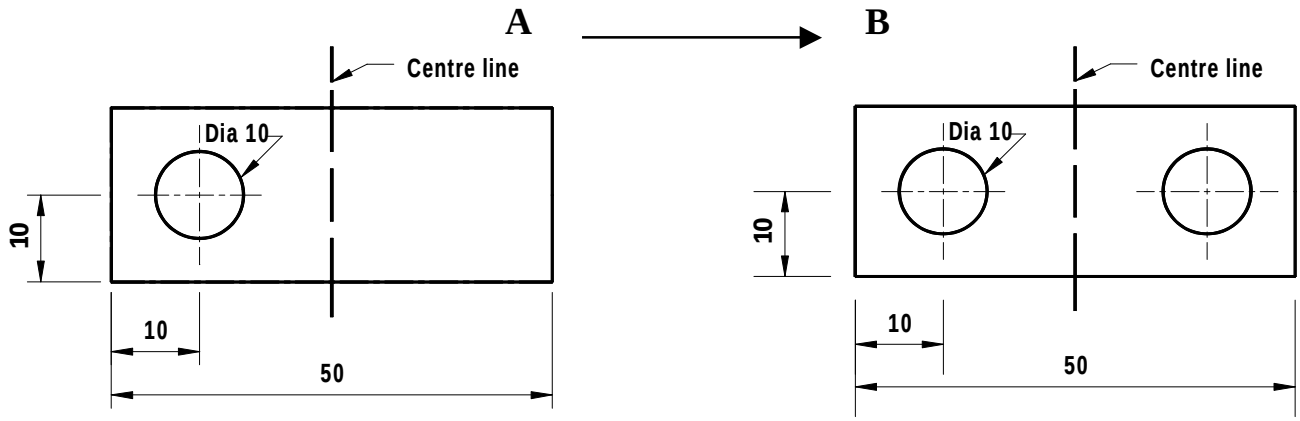
2 _____

3 _____

4 _____

5 _____

(b) Given the drawing at 'A', state the command and explain the procedure used to complete the drawing shown at 'B' below.



Command _____

Procedure _____

_____

(a) Explain the function of **any three** of the electrical components shown below.

Earth rod

ESB Meter

Fuse

Consumer board

(1) Earth rod _____

_____

(2) ESB meter_____

_____

(3) Fuse _____

_____

(4) Consumer board _____

_____

(b) Water, oil and wind are used to generate electricity in Ireland.

Explain briefly how **one** of these is used to generate electricity.

_____

_____

_____

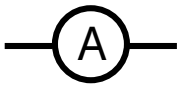
_____

_____

_____

_____

(a) Name and give a use for **any four** of the circuit symbols and components shown.



Name _____

Use _____

_____

Name _____

Use _____

_____

Name _____

Use _____

_____

Name _____

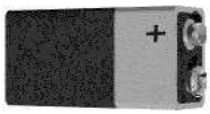
Use _____

_____

Name _____

Use _____

_____



Name _____

Use _____

_____

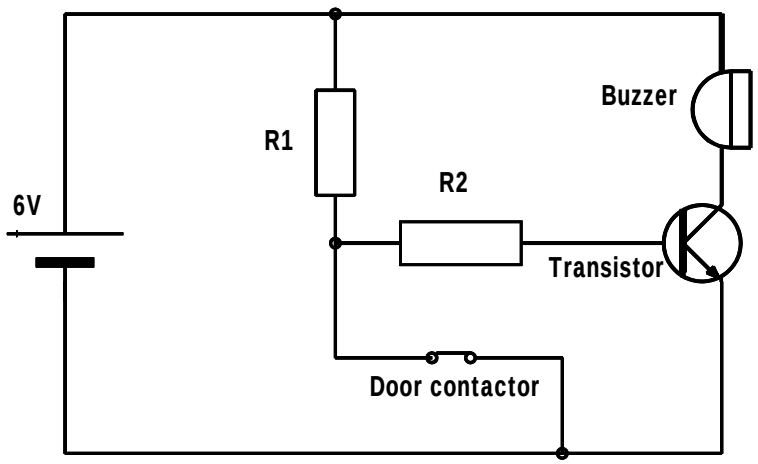
(b) A basic circuit for an alarm system is shown below.
Explain how the circuit works when the door contactor is open.

_____

_____

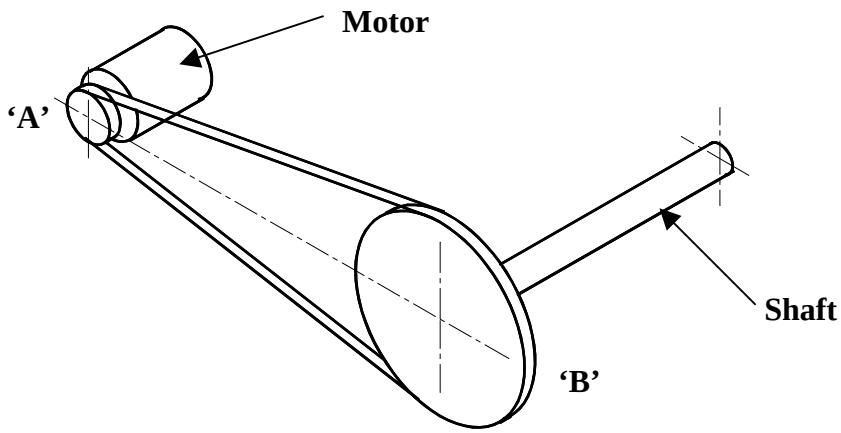
_____

_____



Section 2 **Q7 (d) Mechanisms** **25 marks**

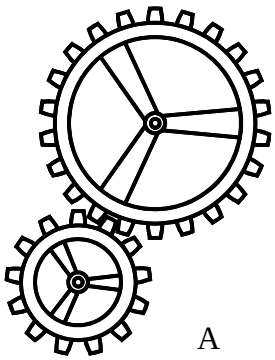
(a) The motor shown rotates at 1000 RPM and pulley 'A' is 8 mm in diameter. If pulley 'B' has a diameter of 40 mm calculate its RPM.



RPM _____

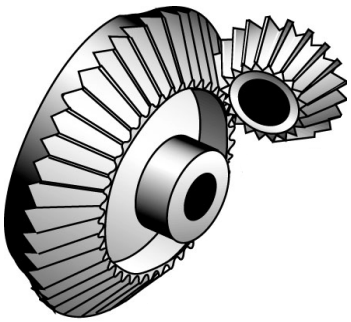
_____

(b) Identify **any two** of the mechanisms A, B or C and state where they are used.



A

B



C

	Name	Where used
Mechanism A		_____
Mechanism B		_____
Mechanism C		_____

(a) For any two of the following pneumatic symbols, name the symbol and give a use for the component.

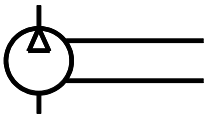
Name _____

_____

Use _____

_____

_____



Name _____

_____

Use _____

_____

_____

Name _____

_____

Use _____

_____

_____

(b) A common type of pneumatic cylinder, used to open and close a barrier, is shown below.

(1) Name the type of cylinder shown.

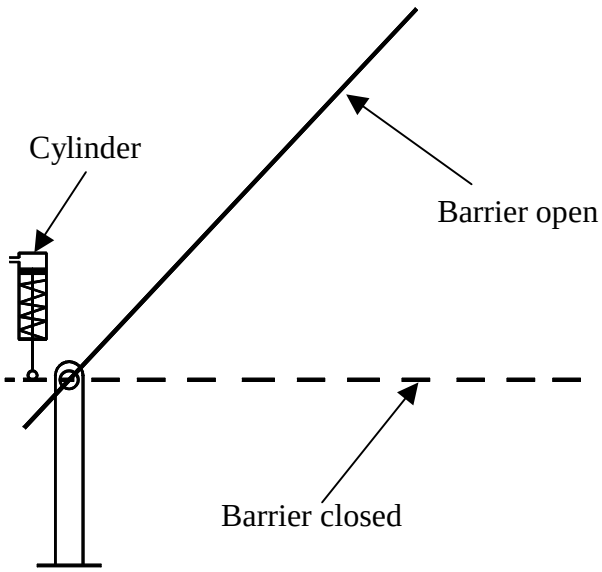
_____

(2) Explain how this cylinder operates the barrier.

_____

_____

_____



(c) Give **two** safety precautions that must be observed when using compressed air.

1 _____

_____

2 _____

_____

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