



**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**

**Junior Certificate 2012**

**Marking Scheme**

**Technology**

**Ordinary Level**



# *Technology*

## *Ordinary Level*

# *Marking Scheme*

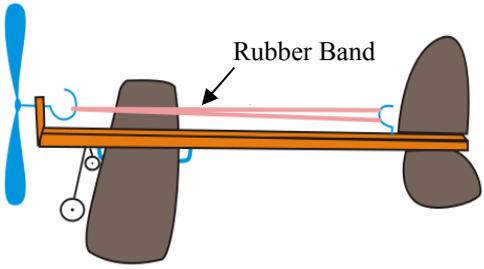
**Section A**, 20 short questions, candidates to answer any 16. 80 marks

**Section B**, 4 long questions, candidates to answer any 2. 80 marks

Section A – 80 Marks. Answer **any sixteen** questions in this section.

<p>1.</p> 	<p>Shown is a graphic of a car. The graphic of the car is:</p>	<p>A Pictorial view</p>	<p>⑤</p>
		<p>An Elevation</p>	
		<p>A Plan</p>	
<p>2.</p> 	<p>In digital camera technology the number of Megapixels is a measure of:</p>	<p>The size of the lens</p>	
		<p>Image quality</p>	<p>⑤</p>
		<p>The quality of the flash</p>	
<p>3.</p> 	<p>To type a capital letter with a computer keyboard you can use the:</p>	<p>Tab key</p>	
		<p>Alt key</p>	
		<p>Shift key</p>	<p>⑤</p>
<p>4.</p> 	<p>Shown is a resistor. Resistance is measured in:</p>	<p>Volts</p>	
		<p>Amps</p>	
		<p>Ohms</p>	<p>⑤</p>
<p>5.</p> 	<p>The toggle switch shown is:</p>	<p>DPDT</p>	
		<p>SPST</p>	<p>⑤</p>
		<p>SPDT</p>	

6. 	The 'U' in USB stands for:	Universal	⑤
		Unicode	
		Unilateral	

7. 	Shown is a toy plane which uses a rubber band. The force in the rubber band is:	Compression	
		Tension	⑤
		Bending	

8. 	Shown is a geodesic dome. A geodesic dome is a:	Frame structure	⑤
		Shell structure	
		Tensile structure	

9. 	On the stapler shown, 'A' marks the position of the:	Load	
		Effort	
		Fulcrum	⑤

10. 	Three electronic components are shown. Which of these components is used for light or dark sensing?	Component A	⑤
		Component B	
		Component C	

<p>11.</p> 	<p>Plastic drinks bottles are made using a process called:</p>	<p>Vacuum forming</p>	
		<p>Line bending</p>	
		<p>Blow moulding</p>	<p>⑤</p>
<p>12.</p> 	<p>The wood from the ash tree is an example of a:</p>	<p>Hardwood</p>	<p>⑤</p>
		<p>Softwood</p>	
		<p>Greenwood</p>	
<p>13.</p> 	<p>Copper is:</p>	<p>An alloy</p>	
		<p>A pure metal</p>	<p>⑤</p>
		<p>A ferrous metal</p>	
<p>14.</p> 	<p>The television was invented by:</p>	<p>Thomas Edison</p>	
		<p>John Logie Baird</p>	<p>⑤</p>
		<p>Nikola Tesla</p>	
<p>15.</p> 	<p>The production of the Model T Ford in 1920 was one of the first examples of:</p>	<p>One-off production</p>	
		<p>Just-in-time production</p>	
		<p>Mass Production</p>	<p>⑤</p>

16.		The safety sign shown symbolises:	A danger zone	
			A toxic substance	⑤
			A radioactive material	
17.		The tool shown is:	An open wrench	⑤
			A ring spanner	
			A torque wrench	
18.		The blade of a scroll saw moves up and down. This is an example of:	Rotary motion	
			Oscillating motion	
			Reciprocating motion	⑤
19.		The mechanism on the side of the toolbox shown is an example of a:	Rack and pinion	
			Parallel linkage	⑤
			Simple gear train	
20.		This symbol, often found on packaging, means:	Reduce	
			Reuse	
			Recycle	⑤

Section B – 80 Marks.  
Answer **any two** questions from this section.

**Question 1**

**40 Marks**

**(a)** A graphic of a desk tidy is shown. On the desk tidy, a folded plastic panel is used to display a timetable.

12 marks

(i) Name a suitable plastic for the folded panel shown and give a reason for your choice.

Plastic: Acrylic (2)

Reason: Easily folded to shape (2)

\_\_\_\_\_

(ii) It was decided to add a plastic top surface to the wooden base. Suggest a reason for this.

To improve the appearance of the product. (2)

\_\_\_\_\_

\_\_\_\_\_

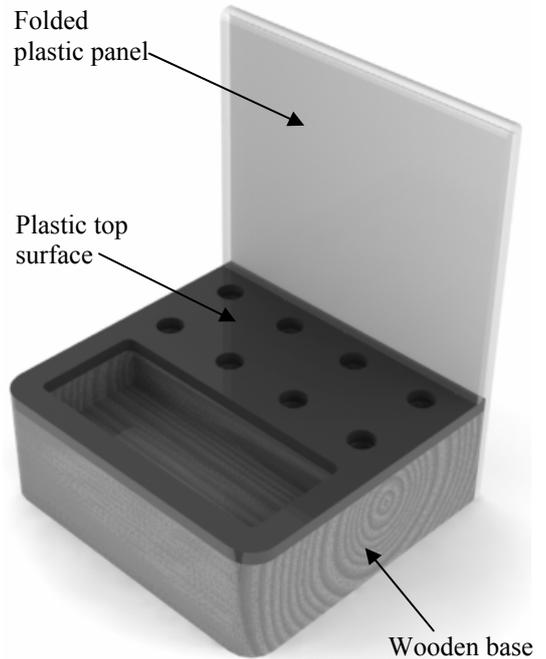
(iii) List **three** woods suitable for the base:

1. Oak                      2. Ash                      3. Elm

(2)

(2)

(2)



Desk Tidy

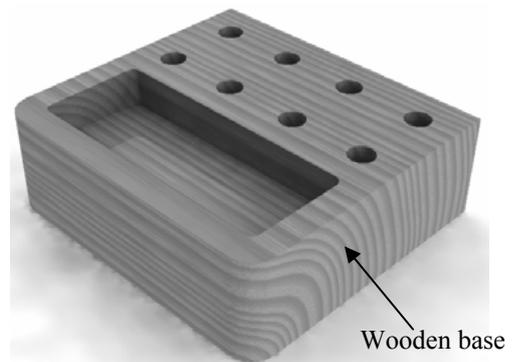
**(b)** (i) Eight holes had to be drilled in the wooden base to a depth of 20mm. Explain how you would ensure that the drill bit does not drill deeper than 20mm for these holes.

8 marks

Set a depth stop on a pillar drill. (4)

\_\_\_\_\_

\_\_\_\_\_



(ii) Describe the process of finishing the wood so that it is smooth and easily kept clean.

After sanding and cleaning apply an appropriate surface treatment. (4)

\_\_\_\_\_

\_\_\_\_\_

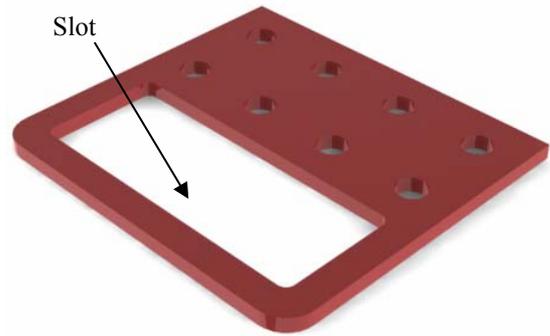
\_\_\_\_\_

\_\_\_\_\_

## Question 1

12 marks

- (c) (i) The shape of the slot removed from the plastic top surface of the desk tidy is rectangular with the corners rounded as shown.



To make the slot, a drill, scroll saw and file were used. Explain in detail how the tools listed were used to do this.

*Drill: Used to drill 4 holes in the corners of the slot*

③

*Scroll saw: Used to cut out the excess material.*

③

*File: Used to finish the internal edges of the slot.*

③

- (ii) When deciding the size of the holes in the desk tidy, what did the designer have to consider?

*The size of the pens and pencils that the unit would hold.*

③

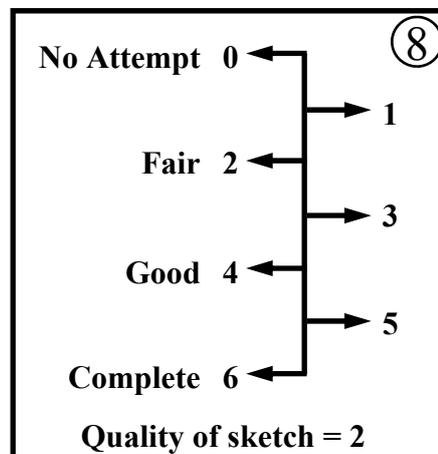
- (d) 8 marks

The designer of this desk tidy was also given the following design brief:

“Design and make a sellotape dispenser to accompany the desk tidy”.

In the space below, sketch your design for this dispenser. Use shading in your design sketch.

Sellotape dispenser

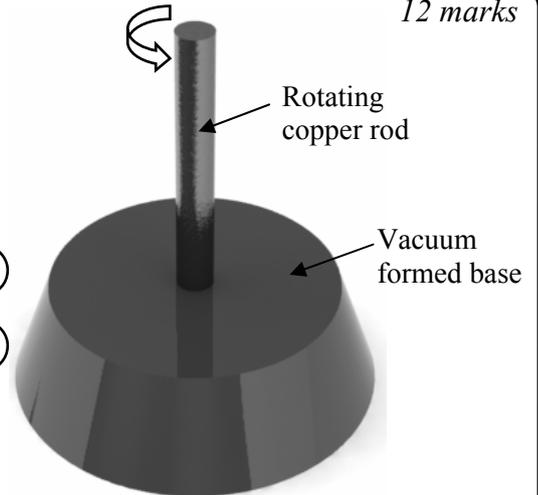


**Question 2**

**40 Marks**

**(a)** The graphic shows a portion of a revolving jewellery tree. A drive mechanism which causes the copper rod to rotate is contained inside the vacuum formed base.

12 marks



(i) Suggest a material for the base and give a reason for your choice.

Material: Any thermoplastic sheet (2)

Reason: Easily formed when softened (2)

(ii) A means of displaying jewellery must be designed and attached to the copper rod. In the space below, make a sketch of a possible design solution.

Design

	←	0					(8)
No Attempt				→	1		
Fair	←	2		→	3		
Good	←	4		→	5		
Complete	←	6					
Quality of sketch = 2							

**(b)** The drive mechanism shown is to be used to rotate the copper rod. Name the mechanism and list **three** advantages of using it for this purpose.

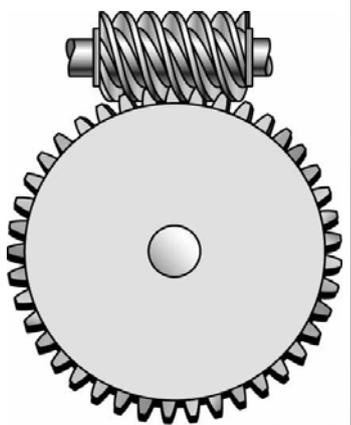
8 marks

Name: Worm and wormwheel (2)

1. High velocity ratio (2)

2. Can be used where space is restricted (2)

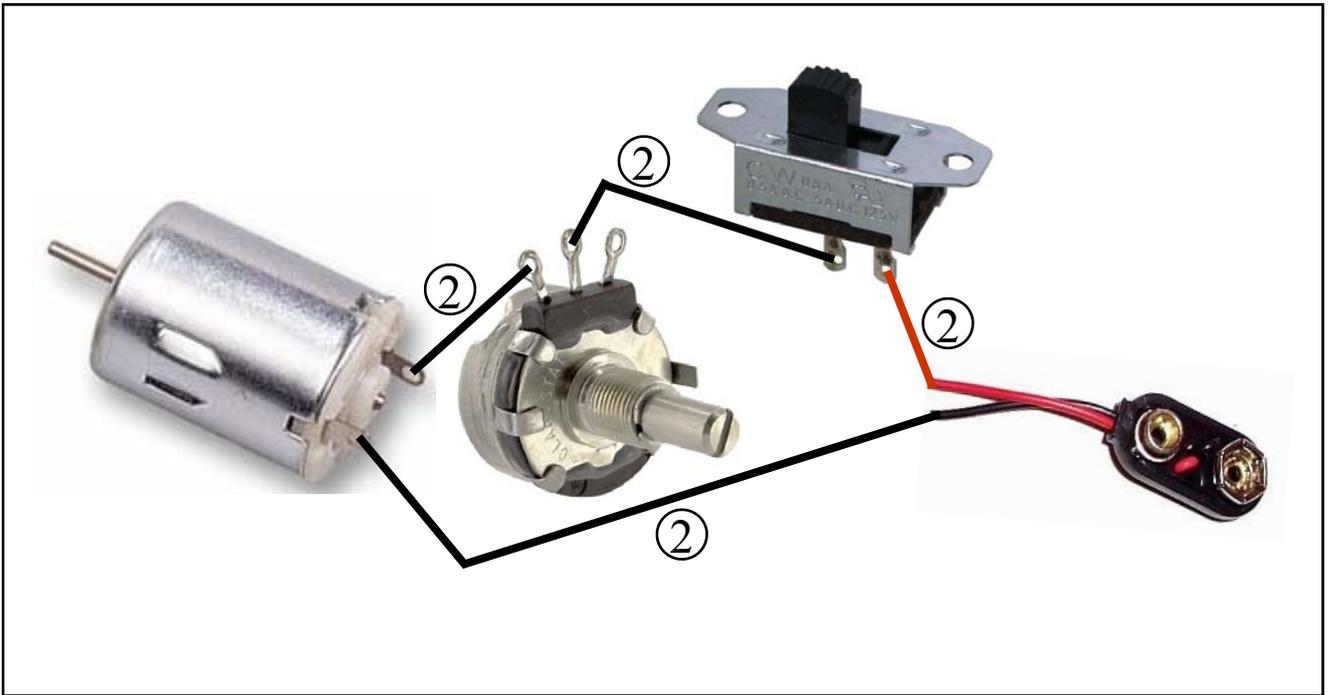
3. Converts input to output motion by 90 degrees (2)



Copper rod drive mechanism

## Question 2

- (c) A miniature motor is used to power the drive mechanism and a variable resistor is used as a basic speed controller. Connect the components below to show how this could be achieved. 8 marks



- (d) The base of the jewellery tree has been vacuum formed. Describe the process of vacuum forming. 6 marks

\_\_\_\_\_ ②

*Place sheet securely in vacuum former with the desired mould.*

\_\_\_\_\_ ②

*Heat the plastic sheet to the correct temperature and apply vacuum.*

\_\_\_\_\_ ②

*Allow to cool, remove from machine, trim and finish to desired shape*

\_\_\_\_\_

\_\_\_\_\_



Vacuum forming machine

- (e) Copper is a non-ferrous metal. 6 marks

(i) What does non-ferrous mean? ②

\_\_\_\_\_ *A metal that does not contain iron.*

(ii) List **two** common uses for copper in the home. ②

1: \_\_\_\_\_ *Hot water cylinder.*

2: \_\_\_\_\_ *Electrical wire.* ②

**Question 3**

**40 Marks**

**(a)** The graphic shows a mobile phone holder.

12 marks

(i) Part **A** is made from a thermoplastic. What is meant by thermoplastic?

A plastic that will soften when reheated.

②

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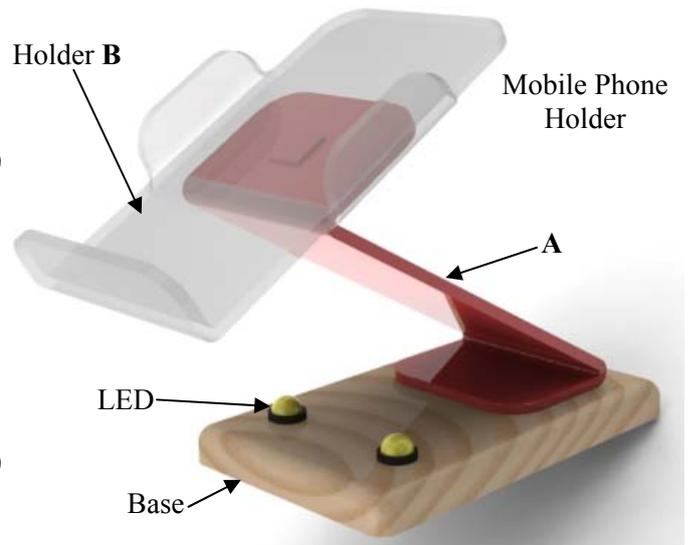


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Name the machine used to bend part **A**.

A strip heater.

②



(ii) Part **A** must be joined to both the base and to the holder **B**. Describe in detail a suitable method of joining in **each** case.

Part **A** to the base: Describe a method using adhesive.

②

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Part **A** to the holder **B**: Describe a method using screws.

②

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**(b)** Draw a well-proportioned development of the holder **B** on the square grid below.

8 marks

No Attempt	0	←	⑧
		→	
Fair	2	←	
		→	
Good	4	←	
		→	
Complete	6	←	
		→	
Quality of sketch = 2			

### Question 3

12 marks

(c) Two LEDs are to be used to light up the mobile phone holder from underneath.

(i) What is meant by the term LED?

LED: Light Emitting Diode

②

List **two** other uses of LEDs.

1. Low powered lamps.

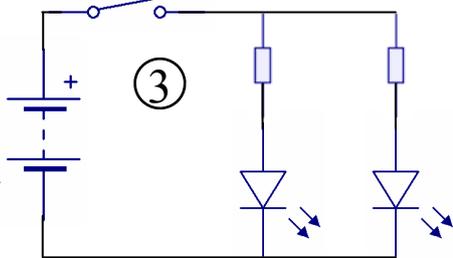
②

2. Power on indicators.

②

(ii) Use the symbols below to draw a diagram of a circuit that can be switched off and on and includes **two** LEDs which are connected in parallel.

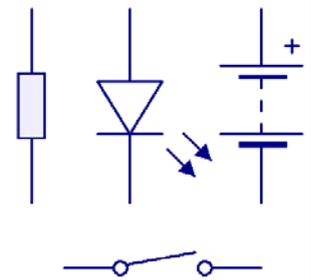
Circuit Diagram



③

③

Placement of all components = 3  
Valid connection of components = 3



8 marks

(d) (i) List **four** important things that the designer had to know before designing the mobile phone holder.

1. Exact dimensions of phone.

①

2. Weight of phone.

①

3. Location of charger point on the phone.

①

4. Location of audio port on the phone.

①

(ii) Sketch your design for part A of the mobile phone holder in the box given.

Design for part A

Weak 1 ←  
Fair 2 ←  
Good 3 ←  
Complete 4 ←

Question 4

40 Marks

(a) 16 marks

The scientist Michael Faraday invented the electric motor.

(i) List **four** household devices that use an electric motor.

1. A blender (2)      2. A dish washer (2)

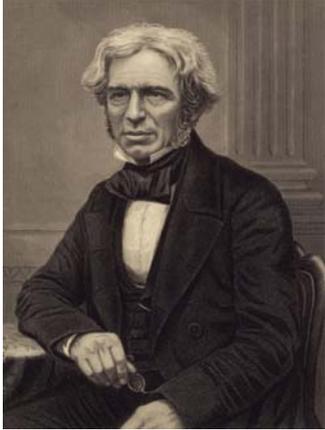
3. A washing machine (2)      4. A vacuum cleaner (2)

(ii) There are two types of motor - AC motors and DC motors. What is meant by each of the terms AC and DC?

AC: Alternating Current (2)      DC: Direct Current (2)

(iii) Name **one** energy conversion taking place in an electric motor.

From: Electrical (2) to Mechanical (2)



(b) 12 marks

Electric cars are becoming more popular every year. Suggest **two** reasons for this.

1: Environmental awareness. (3)

2: Increased cost of petrol/diesel. (3)

Describe **two** ways in which electric motorised devices are helping people with physical disabilities to be more independent.

1. Electric wheelchairs allow people to travel independently. (3)

2. Electric lifts in the home enable access to first floor bedrooms. (3)

(c) 12 marks

List **two** environmentally friendly methods of generating electricity.

1. Wind generators (2)      2. Solar panels (2)

For **each** method, state **one** advantage and **one** disadvantage.

Method 1: Advantage Wind: abundance of wind in Ireland (2)

Disadvantage Can be unsightly and may impact on the environment. (2)

Method 2: Advantage Solar: gain energy from the sun (2)

Disadvantage Can be expensive to install (2)