



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination, 2014

Technology
Ordinary Level

Wednesday, 18 June
Afternoon, 2:00 - 4:00

Instructions:

1. Answer **Section A** (short answer questions). 80 marks
2. Answer **two** questions from **Section B**. 80 marks
3. Hand up this paper at the end of the examination.
4. Write your examination number in the box below.

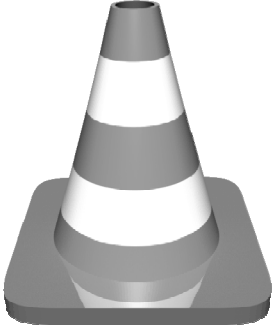




Centre Number


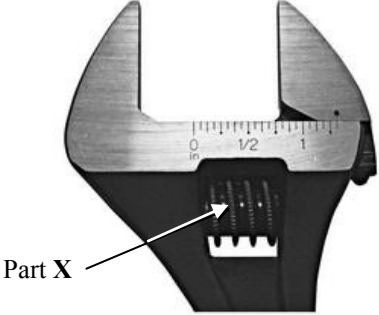

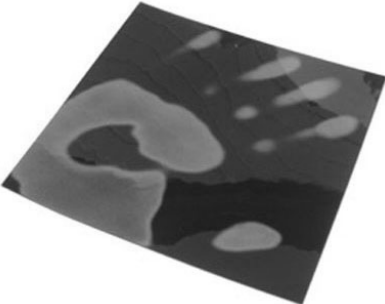

Examination Number


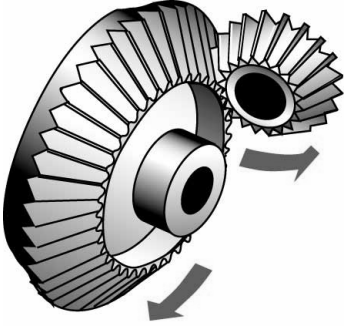
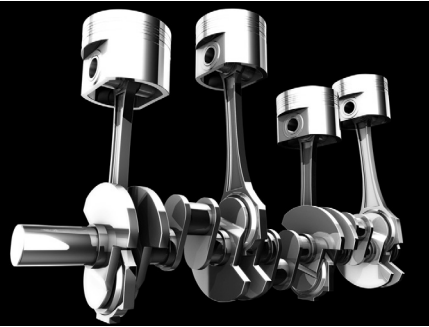


1.	Total of end of page totals	
2.	Aggregate total of all disallowed question(s)	
3.	Total mark awarded (1 minus 2)	
4.	Bonus mark for answering through Irish (if applicable)	
5.	Total mark awarded if Irish Bonus (3+4)	
	Note: The mark in row 3 (or row 5 if an Irish bonus is awarded) must equal the mark in the Móriomlán box on the script	

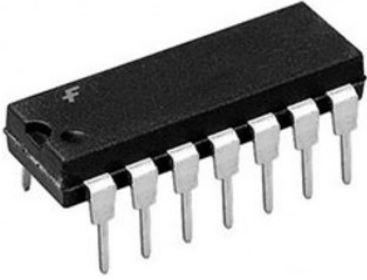


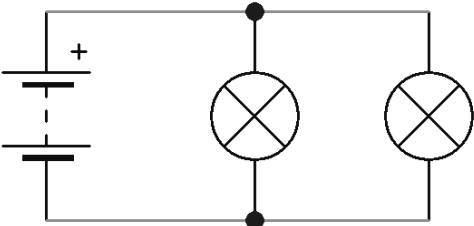

Total Mark	
Question	Mark
Section A	
Section B Q 1	
Q 2	
Q 3	
Q 4	
Total	
Grade	

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

<p>1.</p> 	<p>The traffic device shown is:</p>	<p>Cylindrical</p>	
		<p>Conical</p>	
		<p>Pyramidal</p>	
<p>2.</p> 	<p>The capacity of an external hard drive is usually measured in:</p>	<p>Gigabytes</p>	
		<p>Kilobytes</p>	
		<p>Bytes</p>	
<p>3.</p> 	<p>A software application that requires the use of a webcam is:</p>	<p>Microsoft Word</p>	
		<p>Skype</p>	
		<p>SolidWorks</p>	
<p>4.</p> 	<p>Plastic is used for electrical products because it is:</p>	<p>A conductor</p>	
		<p>A capacitor</p>	
		<p>An insulator</p>	
<p>5.</p> 	<p>The process of coating steel to prevent rusting is called:</p>	<p>Soldering</p>	
		<p>Galvanising</p>	
		<p>Welding</p>	

<p>6.</p> 	<p>Rubber is used to make wristbands because it is:</p>	<p>Elastic</p>	
<p>7.</p> 	<p>Part X in the head of the adjustable wrench is:</p>	<p>A worm gear</p>	
<p>8.</p> 	<p>The item shown is a:</p>	<p>Drill bit</p>	
<p>9.</p> 	<p>Thermo-chromic materials change colour in response to changes in:</p>	<p>Light</p>	
<p>10.</p> 	<p>LEDs are now used in torches because they:</p>	<p>Use very little energy</p>	
		<p>They look good</p>	
		<p>They heat up</p>	

<p>11.</p> 	<p>The downward force produced by a house acting on the ground is:</p>	<p>Shear</p>	
		<p>Torsion</p>	
		<p>Compression</p>	
<p>12.</p> 	<p>The items shown are:</p>	<p>Bevel gears</p>	
		<p>Spur gears</p>	
		<p>Worm gears</p>	
<p>13.</p> 	<p>The pistons in an engine:</p>	<p>Reciprocate</p>	
		<p>Oscillate</p>	
		<p>Rotate</p>	
<p>14.</p> 	<p>The force that converts the kinetic energy of a car to heat energy in the brakes is called:</p>	<p>Bending</p>	
		<p>Friction</p>	
		<p>Tension</p>	
<p>15.</p> 	<p>The energy produced by devices such as solar cells is often referred to as:</p>	<p>Blue energy</p>	
		<p>Green energy</p>	
		<p>Red Energy</p>	

<p>16.</p> 	<p>Microchips are often called ICs. IC stands for:</p>	<p>International Circuit</p>	
<p>17.</p> 	<p>This energy saving light bulb:</p>	<p>Has lower wattage than a standard light bulb.</p>	
<p>18.</p> 	<p>The long leg of the capacitor is:</p>	<p>Negative</p>	
<p>19.</p> 	<p>The bulbs in this circuit are in:</p>	<p>Parallel</p>	
<p>20.</p> 	<p>The pneumatic bicycle tyre was invented by:</p>	<p>Harry Ferguson</p>	
		<p>John Boyd Dunlop</p>	
		<p>John Philip Holland</p>	

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

Question 1

40 Marks

(a) An image of a ring-throwing game is shown.

12 marks

- (i) Brass was selected as the material for the rod.
 Give a reason for this choice.

Reason: _____

- (ii) Name a suitable wood for the base and give a reason for your choice.

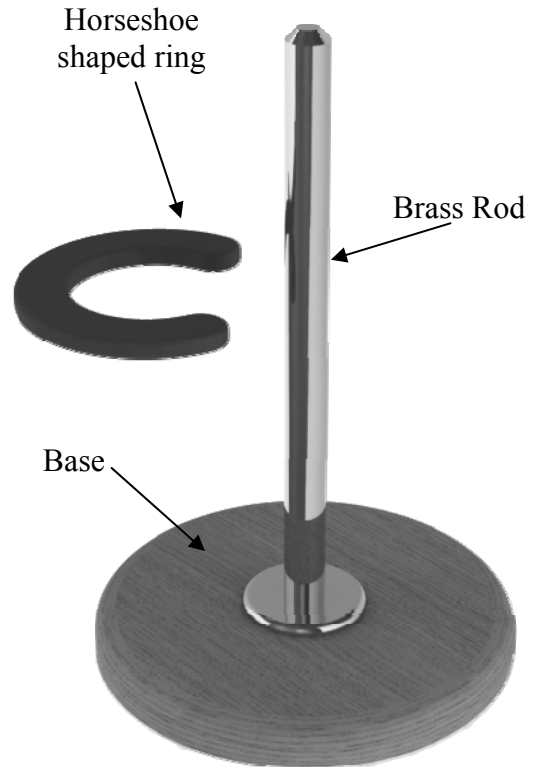
Wood: _____

Reason: _____

- (iii) A ring is required that will not damage the wood or the brass. Name a suitable material for the ring and state a property of this material.

Material: _____

Property: _____



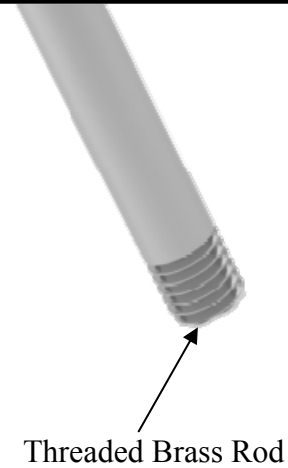
Ring Throwing Game

- (b)** (i) Name a tool that could be used to cut the thread at the end of the rod. Give a reason why a thread is a suitable method of joining the rod to the base.

8 marks

Tool: _____

Reason for using a thread: _____



- (ii) A large diameter base has been used. Suggest a reason for this.

Reason for large base: _____

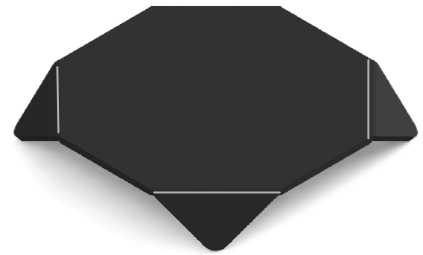
Question 1

12 marks

- (c) (i) An alternative base for the game is shown in which the four corners are folded downwards.
Name a suitable material for this base and explain the procedure for bending the corners.

Material: _____

Bending procedure: _____



Alternative Base

- (ii) Make labelled sketches of an alternative method of joining the brass rod to the base shown above.

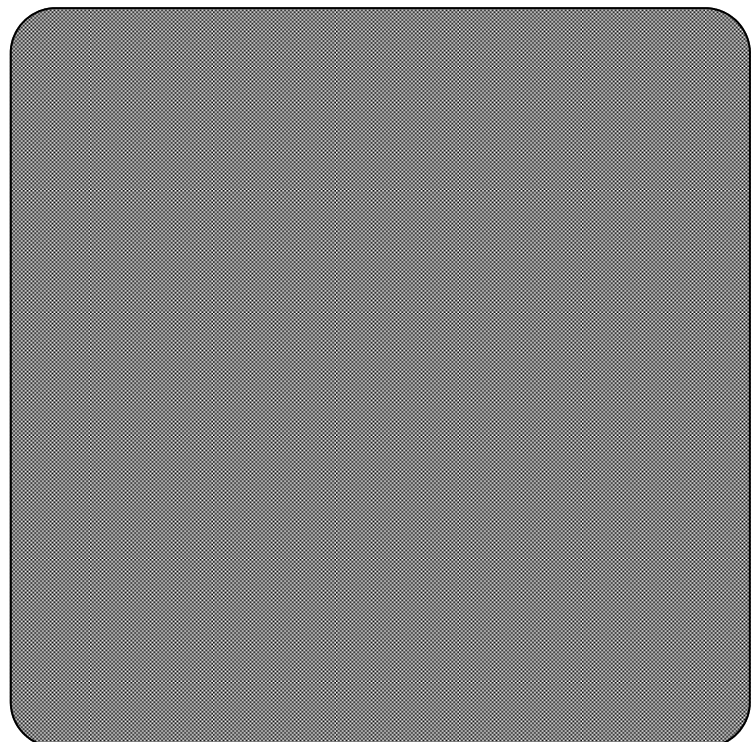
Joining Method

- (d) The material for making the alternative base is shown.

8 marks

- (i) Draw in all the lines required for marking out the bends at the four corners.
- (ii) The marking out of the bend lines at all four corners must be exactly the same. Give a reason for this.

Reason: _____



Question 2

40 Marks

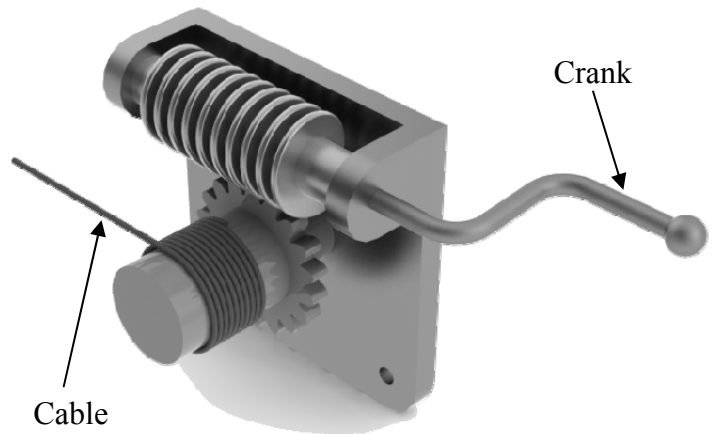
12 marks

(a) An image of a mechanism used for tensioning the net on a tennis court is shown.

(i) Give **two** reasons why this mechanism is suitable for this purpose.

1. _____

2. _____



Net Tensioner

(ii) A crank handle is used to turn the mechanism. Name **two** other devices/mechanisms that use a crank handle.

Device 1: _____

Device 2: _____

(iii) Suggest one change that could be made to the crank to make it easier to turn the mechanism.

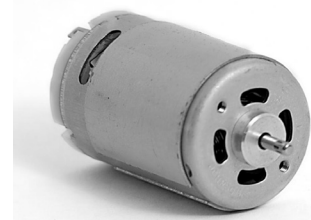
Change: _____

8 marks

(b) (i) A version of the above mechanism uses a motor instead of the crank handle. It also uses a double-pole double-throw switch (DPDT switch).

Give a reason why this DPDT switch is needed to control the motor.

Reason: _____



Motor

(ii) Suggest a method of automatically stopping the motor when the net is fully tensioned.

Answer: _____



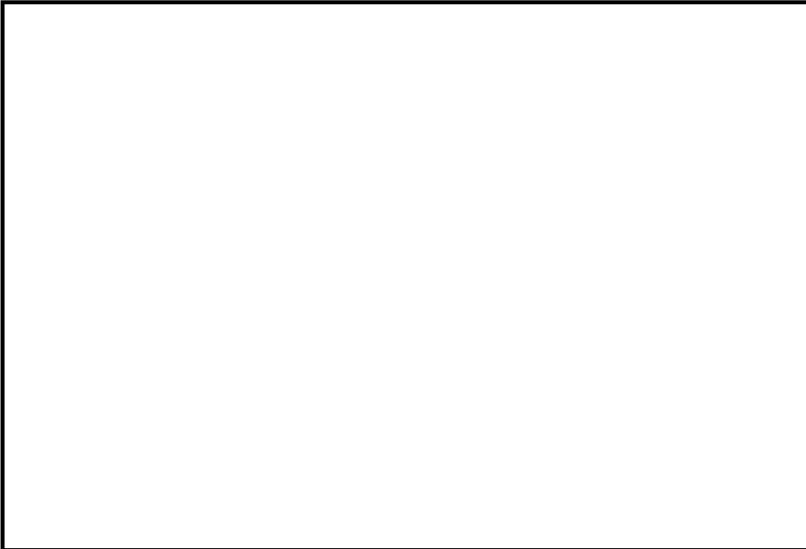
DPDT switch

Question 2

- (c) The strings of a tennis racket are in tension. This is what makes the head of a tennis racket strong.

8 marks

Name and sketch another item (from sport or elsewhere) that uses tension to make it strong.



- (d) Old tennis rackets were made from wood. Modern rackets are made from special plastics or carbon fibre.

6 marks

Give **two** reasons why manufacturers stopped using wood to make the rackets.

Reason 1: _____

Reason 2: _____



Wooden Racket

- (e) (i) Ash is used in the making of hurleys. Give **one** reason why ash is used.

6 marks

Answer: _____

- (ii) Suggest **one** advantage of using wood for this purpose instead of plastic.

Advantage: _____



Question 3

40 Marks

(a) A company producing solar panels wishes to give a child’s nightlight to each of its customers for advertising purposes. Two LEDs light up a display panel. A logo representing the company is placed on the display panel.

12 marks

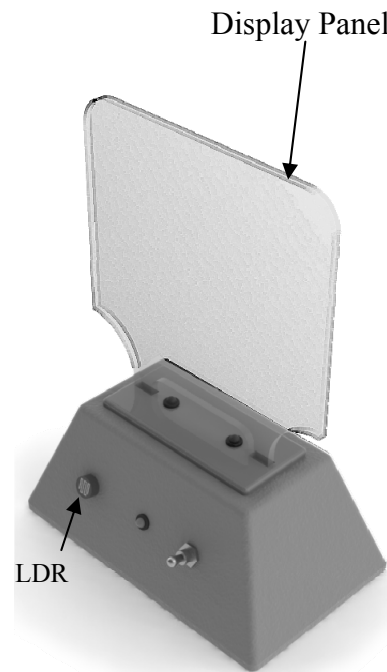
(i) The display panel is tinted. Explain the term ‘tinted’.

Answer: _____

(ii) An LDR is used in the control circuit of the nightlight. Explain the term LDR and suggest why it is needed.

LDR: _____

Why it is needed: _____



Night Light

(iii) Name a suitable material for the tinted display panel and give a reason for your choice.

Material: _____

Reason for choosing: _____

(b) (i) Half of the outline of the tinted display panel is shown. Complete the drawing of the display panel in the space provided.

8 marks

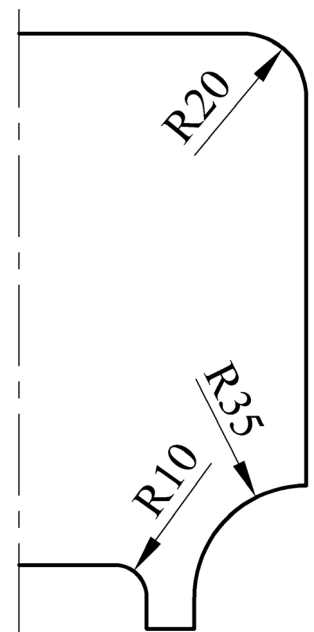
(ii) Two red LEDs light up the display panel. Explain the term LED.

LED: _____

(iii) List **two** steps required to produce a smooth finish on the edges of the display panel.

Step 1: _____

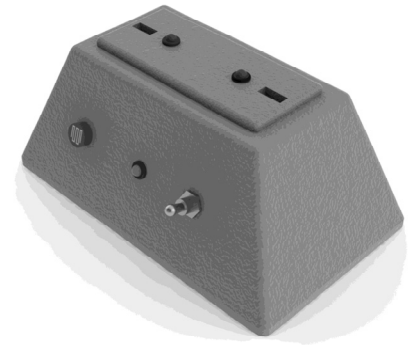
Step 2: _____



Question 3

12 marks

- (c) (i) The circuit box of the night light is vacuum formed. In the space below make a sketch of the mould needed to form this shape.



Circuit box

- (ii) High Impact Polystyrene (HIPS) is used to make the circuit box. List **two** important properties of this material that make it suitable for vacuum forming.

Property 1: _____

Property 2: _____

- (iii) An LED is used on the front panel to act as a *pilot light*. What is the purpose of a pilot light?

Answer: _____

- (d) The company producing the solar panels requires a logo to be etched into the tinted display panel. In the space below, make a sketch of your design for this logo.

8 marks

Logo Design

Question 4

40 Marks

(a) *12 marks*
Electronic technology is playing an ever increasing role in sport. Describe **three** modern uses for this technology in sports.

1. _____

2. _____

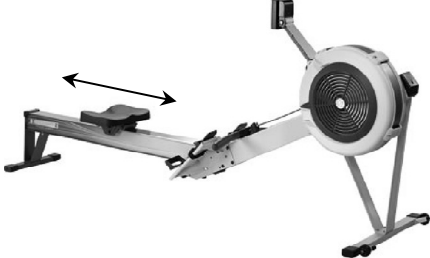
3. _____

(b) *12 marks*

(i) This rowing machine uses a chain drive.
Give **two** reasons for using a chain drive for this purpose.

Reason 1: _____

Reason 2: _____



(ii) The seat on the rowing machine can glide backwards and forwards as shown, in response to the movement of the person using it. Suggest a way of obtaining this smooth motion.

Answer: _____

(iii) Name **two** other machines that use a chain drive.

Machine 1: _____ Machine 2: _____

(c) *16 marks*

(i) Suggest **one** possible advantage and **one** possible disadvantage of wind power generation.

Advantage: _____

Disadvantage: _____

(ii) Give **two** reasons why carbon fibre is now being used to make the blades of wind turbines.

Reason 1: _____

Reason 2: _____

