



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination, 2016

Technology

Ordinary Level

Wednesday, 22 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.

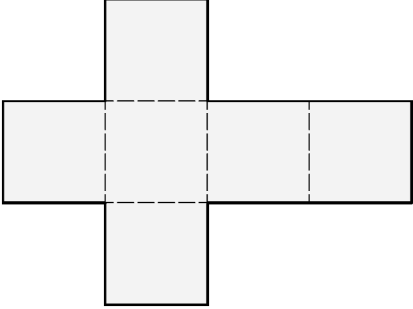


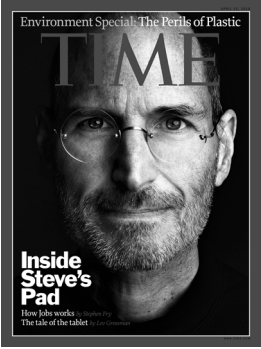


Centre Number


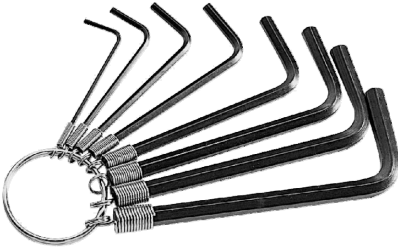
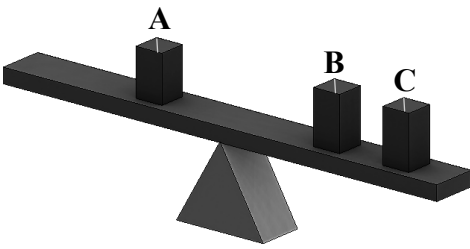

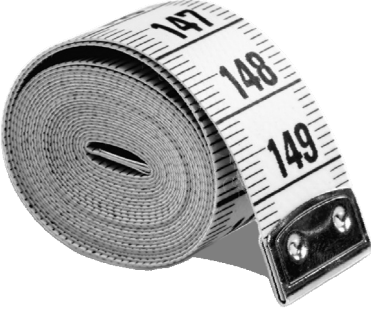
Examination Number



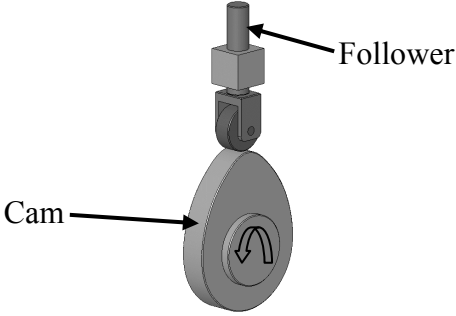


1.	Total of end of page totals	
2.	Aggregate total of all disallowed question(s)	
3.	Total mark awarded (1 minus 2)	
4.	Bonus mark for answering through Irish (if applicable)	
5.	Total mark awarded if Irish Bonus (3+4)	
	Note: The mark in row 3 (or row 5 if an Irish bonus is awarded) must equal the mark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



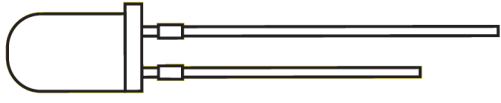
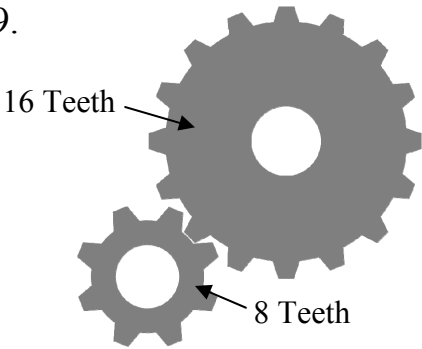

Total Mark	
Question	Mark
Section A	
Section B Q 1	
Q 2	
Q 3	
Q 4	
Total	
Grade	

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

<p>1.</p> 	<p>Shown is a development of a:</p>	<p>Cone</p>	
<p>2.</p> 	<p>The power on/off symbol on electronic devices is usually:</p>		
<p>3.</p> 	<p>Magazines are produced using:</p>	<p>Word Processing Software</p>	
<p>4.</p> 	<p>The property of copper which makes it possible to beat it into curved shapes is:</p>	<p>Brittleness</p>	
<p>5.</p> 	<p>Which of the materials listed is the most environmentally friendly?</p>	<p>Wood</p>	
		<p>Plastic</p>	
		<p>Metal</p>	

<p>6.</p> 	<p>The cables of a suspension bridge are usually made from:</p>	<p>High tensile steel</p>	
		<p>Lead</p>	
		<p>Aluminium</p>	
<p>7.</p> 	<p>The cross section of an Allen key is a:</p>	<p>Square</p>	
		<p>Hexagon</p>	
		<p>Pentagon</p>	
<p>8.</p> 	<p>Different amounts of the same material are put into boxes A, B and C. If the beam is balanced, which box contains the most material?</p>	<p>Box A</p>	
		<p>Box B</p>	
		<p>Box C</p>	
<p>9.</p> 	<p>The peat in these briquettes has been:</p>	<p>Stretched</p>	
		<p>Twisted</p>	
		<p>Compressed</p>	
<p>10.</p> 	<p>The number of millimetres in one metre is:</p>	<p>10,000</p>	
		<p>1,000</p>	
		<p>1,000,000</p>	

<p>11.</p> 	<p>Burning fossil fuels contributes to:</p>	<p>Global warming</p>	
		<p>Global cooling</p>	
		<p>Neither of the above</p>	
<p>12.</p> 	<p>The addition of diamond grit to a cutting blade makes the blade:</p>	<p>Softer</p>	
		<p>Cheaper</p>	
		<p>Last longer</p>	
<p>13.</p> 	<p>The rotating cam causes the follower to:</p>	<p>Reciprocate</p>	
		<p>Rotate</p>	
		<p>Oscillate</p>	
<p>14.</p> 	<p>An example of a renewable energy source is:</p>	<p>Coal</p>	
		<p>Gas</p>	
		<p>Wood</p>	
<p>15.</p> 	<p>Speakers convert:</p>	<p>Chemical energy to electrical energy</p>	
		<p>Electrical energy to sound energy</p>	
		<p>Sound energy to electrical energy</p>	

<p>16.</p> 	<p>When describing a switch, SPST stands for:</p>	<p>Separate Pole Separate Throw</p>	
<p>17.</p> 	<p>Electronic devices that are temperature sensitive are:</p>	<p>Transistors</p>	
<p>18.</p> 	<p>The short leg of an LED is:</p>	<p>Negative</p>	
<p>19.</p> 	<p>When the large gear rotates at 100 RPM, the small gear will rotate at:</p>	<p>100 RPM</p>	
<p>20.</p> 	<p>Laszlo Biro invented the:</p>	<p>Vacuum Cleaner</p>	
		<p>Ball Point Pen</p>	
		<p>Washing Machine</p>	

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

Question 1

40 Marks

(a) An image of a bird feeder is shown.
The roof of the feeder is made from a single piece of material.

10 marks

- (i) Suggest a suitable material for the roof and give a reason for your choice.

Material: _____

Reason: _____

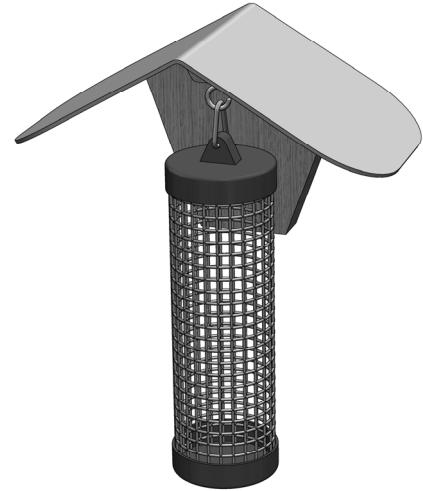
- (ii) Name a machine or tool that could be used to cut out the shape of the roof.

Name: _____

- (iii) A metal mesh is used for the food container. Suggest a suitable metal for the mesh and explain why the size of the square holes in the mesh must be carefully considered.

Suitable metal: _____

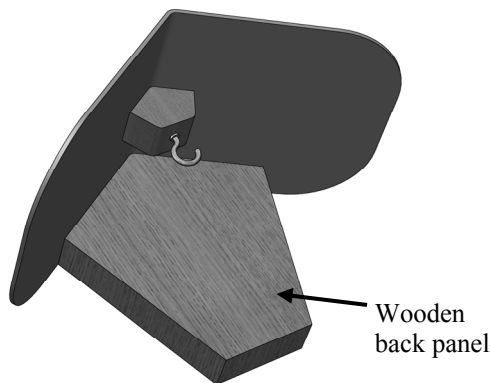
Size of holes: _____



Bird Feeder

(b)

8 marks



- (i) Name a suitable hardwood for the back panel of the bird feeder.

Hardwood: _____

- (ii) Describe a method of attaching the roof to the back panel. Use sketches to illustrate your answer.

Method: _____

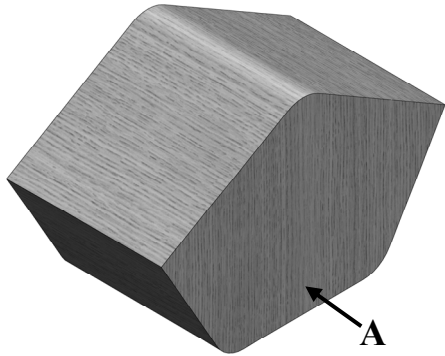
Sketches

Question 1

10 marks

(c) An Isometric View and an End View of part of the feeder are shown below.

In the space opposite sketch an Elevation in the direction of arrow A and project a Plan of the part.



Isometric View



End View

Sketches

(d) Compare the bird feeders A and B under the following headings:

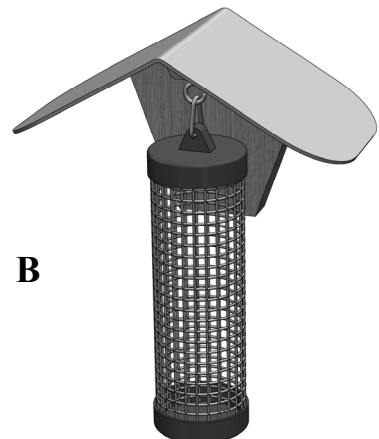
12 marks

Use of materials: _____

Appearance: _____

Durability: _____

Cost: _____



Question 2

40 Marks

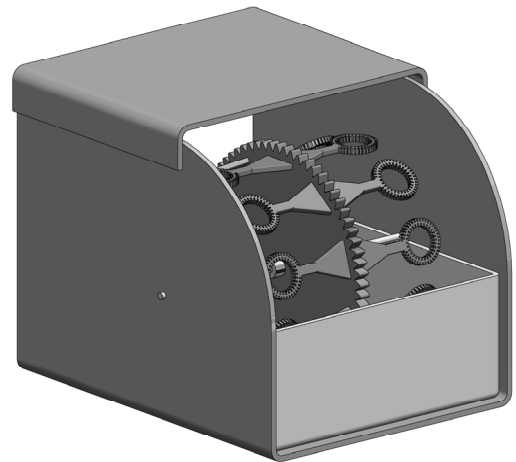
(a) The body of a motorised bubble blower is shown.

10 marks

- (i) Name a suitable material for the top and sides of the bubble blower and give a reason for your choice.

Material: _____

Reason: _____



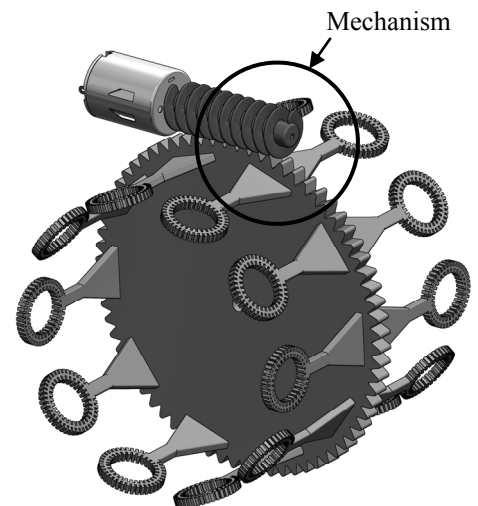
Bubble Blower - main body

- (ii) The graphic shows the wheel that gathers the bubble solution and the mechanism and motor used to turn it.

Name this mechanism and give **one** reason why it is a suitable choice for the bubble blower.

Mechanism Name: _____

Reason: _____



Bubble Wheel

(b)

8 marks

A handle is required to be attached to the top surface of the bubble blower. Make labelled sketches of your design for a suitable handle which could be made in the Technology classroom.

Question 2

(c) There are two motors in the bubble blower. One drives the bubble wheel mechanism and the other drives a propeller which blows air through the system. The motors are connected in parallel.

10 marks

(i) On the images opposite, draw in the electrical wires so that the motors are connected in **parallel**.

(ii) Name an energy conversion which takes place in a motor when it is in use.

_____ to _____

(iii) Name **two** other devices that use miniature motors.

1. _____

2. _____



(d) When connected it was found that the propeller motor was rotating in the wrong direction and as a result was not blowing bubbles through the front of the unit.

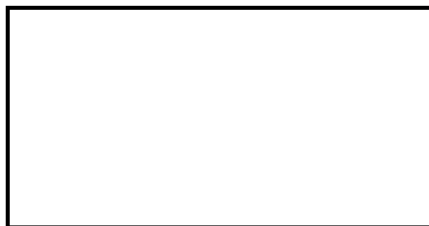
8 marks

(i) Suggest a solution to this problem.

Solution: _____

(ii) A *toggle switch* is used to switch the bubble blower on/off.

Make a sketch of a toggle switch in the box opposite.

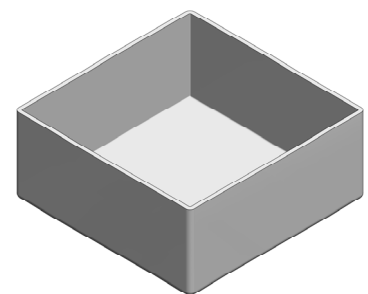


(e) The image shows the container for the bubble solution. It was found that vacuum forming was not a suitable method of producing this container.

4 marks

Suggest a reason for this.

Reason: _____



Container for solution

Question 3

40 Marks

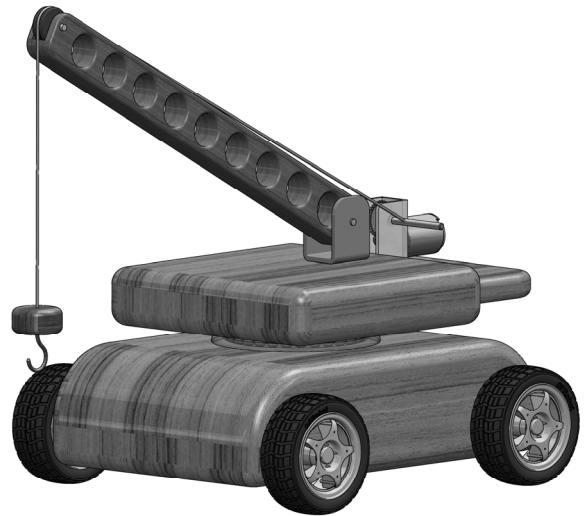
(a) A working model of a wheel-mounted crane is shown. The main parts of the model crane are made from hardwood.

12 marks

(i) Suggest **two** reasons why hardwood was selected for these parts.

Reason 1: _____

Reason 2: _____



Wheel Mounted Crane

(ii) A circuit housing (control box) is required for a switch and battery to control the motor. Make a sketch of a control box that could be fixed in the position shown on the back of the crane. Name a suitable material from which the control box could be made.

Suitable material: _____

	<p>Control Box sketch</p>
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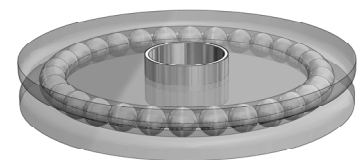
(b) So that the crane can rotate smoothly, a thrust bearing is used.

8 marks

(i) Name **two** other situations where bearings are used.

1. _____

2. _____



Thrust bearing

(ii) Bearings help to reduce a type of resistance. What is the name of this resistance?

Name of resistance: _____

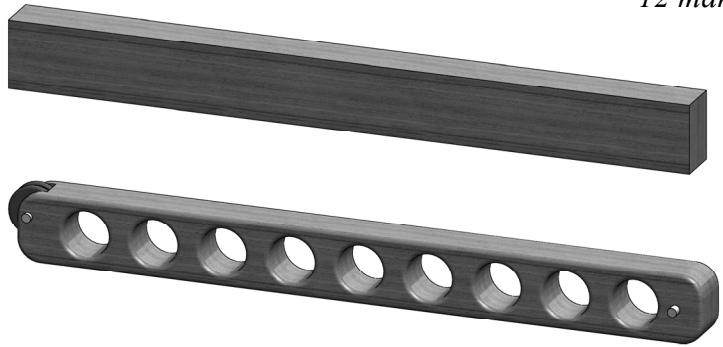
(iii) The ball bearings in a bearing are made from very hard materials. Suggest a suitable material.

Material for ball bearings: _____

Question 3

12 marks

- (c) Shown opposite is a piece of hardwood used to make the boom/jib of the model crane.
The completed boom is also shown.
Describe **four** steps in the manufacture of the boom.



Step 1: _____

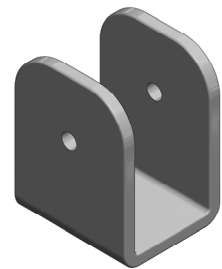
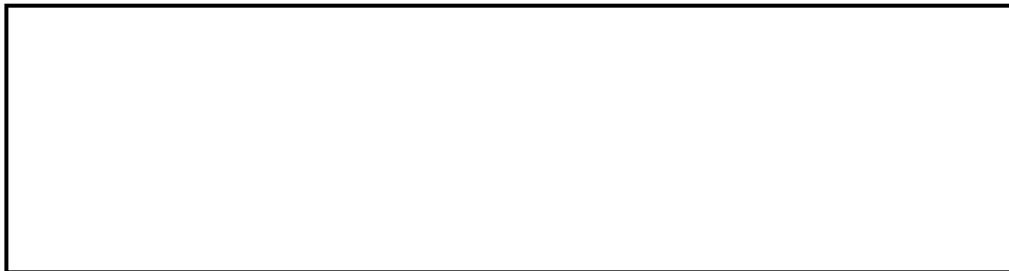
Step 2: _____

Step 3: _____

Step 4: _____

- (d) (i) A bracket is used to connect the boom to the body of the crane.
In the space below draw a flat pattern (development) of the bracket.
You may estimate the dimensions.

8 marks



Bracket

- (ii) Two of the tools used in the manufacture of the bracket are a *try square* and a *hand file*.
In the boxes below make a 3D sketch of **each** of these tools.

Try Square

Hand File

Question 4

40 Marks

(a) The first electricity pole was erected in rural Ireland in November 1946 in Kilsallaghan, Co. Dublin. Previous to this only homes built in towns and cities had electricity.

12 marks



Describe **three** benefits that electricity brought to rural Ireland.

Benefit 1: _____

Benefit 2: _____

Benefit 3: _____

(b) Christopher Latham Sholes invented the first mass produced typewriter. Due to modern technology, typewriters are no longer widely used.

12 marks



(i) Name **two** other devices that are no longer widely used due to developments in modern technology.

1: _____ 2: _____

(ii) Modern day robots are widely used in manufacturing industries. Suggest **one** advantage and **one** disadvantage of the use of robots in manufacturing.

Advantage: _____

Disadvantage: _____

(c) Using the headings given below suggest ways in which a modern bicycle differs from an old 'High Nelly' bicycle.

16 marks

Materials: _____

Weight: _____

Gears: _____

Wheels: _____

