



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination 2009

Technology
Ordinary Level

Wednesday 17 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.

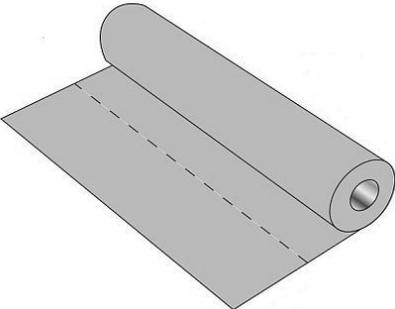
Centre Number

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.

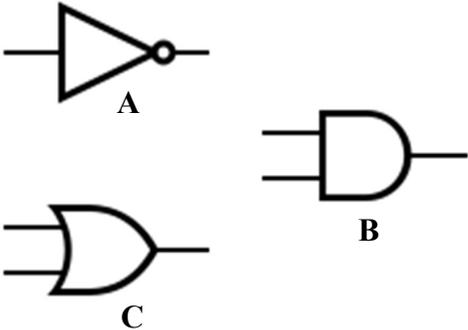
<p>1.</p> 	<p>This drawing is a(n):</p>	<p>Elevation</p>	
		<p>Perspective projection</p>	
		<p>Isometric projection</p>	
<p>2.</p> 	<p>Oak is a:</p>	<p>Hardwood</p>	
		<p>Manufactured board</p>	
		<p>Softwood</p>	
<p>3.</p> 	<p>Modern computer hard drive capacity is measured in:</p>	<p>Bytes</p>	
		<p>Megabytes</p>	
		<p>Gigabytes</p>	
<p>4.</p> 	<p>This is a:</p>	<p>9V battery</p>	
		<p>6V battery</p>	
		<p>1.5V cell</p>	
<p>5.</p> 	<p>Nylon is a(n):</p>	<p>Animal fibre</p>	
		<p>Vegetable fibre</p>	
		<p>Synthetic fibre</p>	

6.		This is a:	Compression spring	
			Tension spring	
			Torsion spring	

7.		The power of low energy light bulbs is measured in:	Amps	
			Volts	
			Watts	

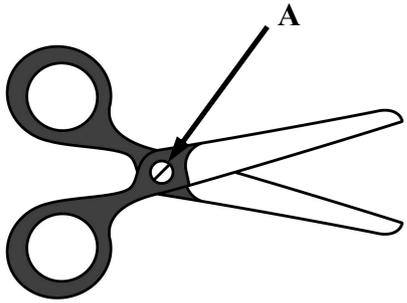
8.		This is a:	Compass	
			Spring dividers	
			Scriber	

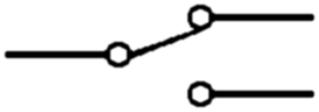
9.		This is a:	Band saw	
			Scroll saw	
			Table saw	

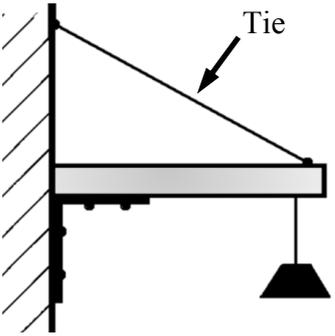
10.		Which of these symbols is a NOT gate?	Symbol A	
			Symbol B	
			Symbol C	

11.		This is a:	Worm and wheel	
			Ratchet and pawl	
			Rack and pinion	

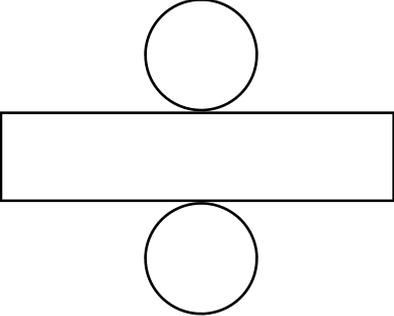
12.		An engine crankshaft and piston is an example of a:	Crank and slider	
			Bevel gear system	
			Chain and sprocket	

13.		The arrow A points to the:	Fulcrum	
			Load position	
			Effort position	

14.		This is the symbol for a:	SPDT switch	
			DPDT switch	
			Push switch	

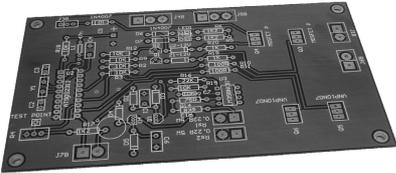
15.		The tie is in:	Shear	
			Tension	
			Compression	

16.		Speakers:	Convert sound into electrical energy	
			Convert electrical energy into sound	
			Convert chemical energy into sound	

17.		This development shows a:	Cube	
			Cylinder	
			Pyramid	

18.		Acrylic is a:	Thermoplastic	
			Thermosetting plastic	
			Composite material	

19.		This is a:	Pan head screw	
			Dome head screw	
			Countersunk head screw	

20.		Shown is a PCB. PCB stands for:	Photo Circuit Board	
			Printed Circuit Board	
			Plastic Circuit Board	

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

Question 1

40 Marks

(a) A model of a solar powered wooden helicopter is shown. A solar cell is fitted into the plastic rotor of the helicopter.

12 marks

(i) List **two** suitable manufactured boards that could be used to make the body of the helicopter.

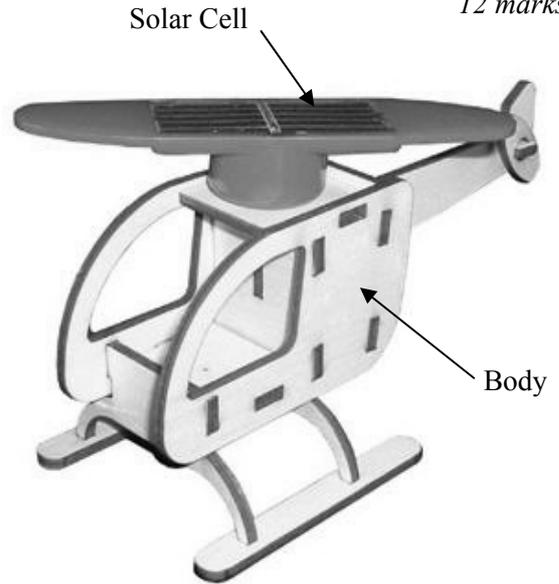
1. _____

2. _____

(ii) What suitable surface finish would you apply to the body of the helicopter?

(iii) What tools would you use to cut out the windows in the helicopter?

(iv) What precautions should be taken when designing a toy for a young child?



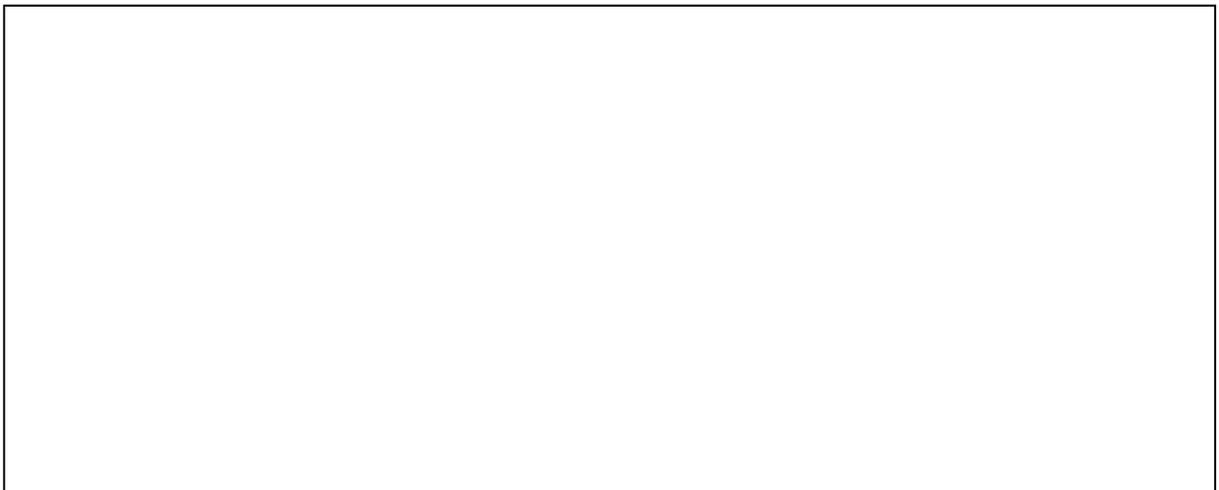
(b) (i) The solar cell in the helicopter powers a motor. This motor produces rotary motion. List **four** other devices that use rotary motion.

8 marks

1. _____ 2. _____

3. _____ 4. _____

(ii) A cam and follower produces reciprocating motion. In the box below draw this mechanism.



Question 1

12 marks

(c) (i) Give **two** common uses of solar cells.

1. _____ 2. _____

(ii) A solar cell converts light energy to electrical energy. Complete the table below by stating the energy conversion for **each** device.

Device	Converts	To
Solar Cell	<i>Light Energy</i>	<i>Electrical Energy</i>
Microphone		
Motor		
Bulb		
Buzzer		

(iii) Wind is a renewable source of energy. List **one** advantage and **one** disadvantage of using wind generators.

Advantage: _____

Disadvantage: _____

(d) The rectangle shown below represents a blank piece of board used to make the side panel of the helicopter. Within this rectangle draw a well proportioned sketch of the shape of the side panel. Colour **or** shade all areas of waste to be removed. 8 marks



Side Panel



Side Panel

Question 2

40 Marks

16 marks

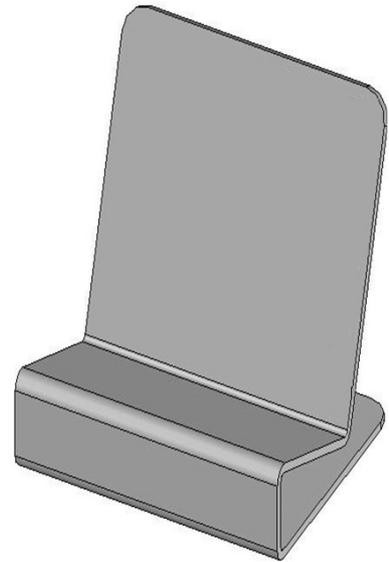
(a) A unit for displaying business cards is shown. This unit is formed from one piece of material.

(i) Name a suitable material for the display unit.

(ii) List **four** processes necessary to make this unit.

- 1. _____
- 2. _____
- 3. _____
- 4. _____

(iii) For **one** process listed above name the tools used.



Display Unit

(iv) The unit was found to slip easily when placed on a smooth surface. Explain how you would solve this problem.

(v) Describe how you would produce a high quality smooth finish on the edges of the unit.

(b) (i) Students use desktop publishing software to produce design folios for project work. List **four** advantages of using this software.

6 marks

- 1. _____
- 2. _____
- 3. _____
- 4. _____

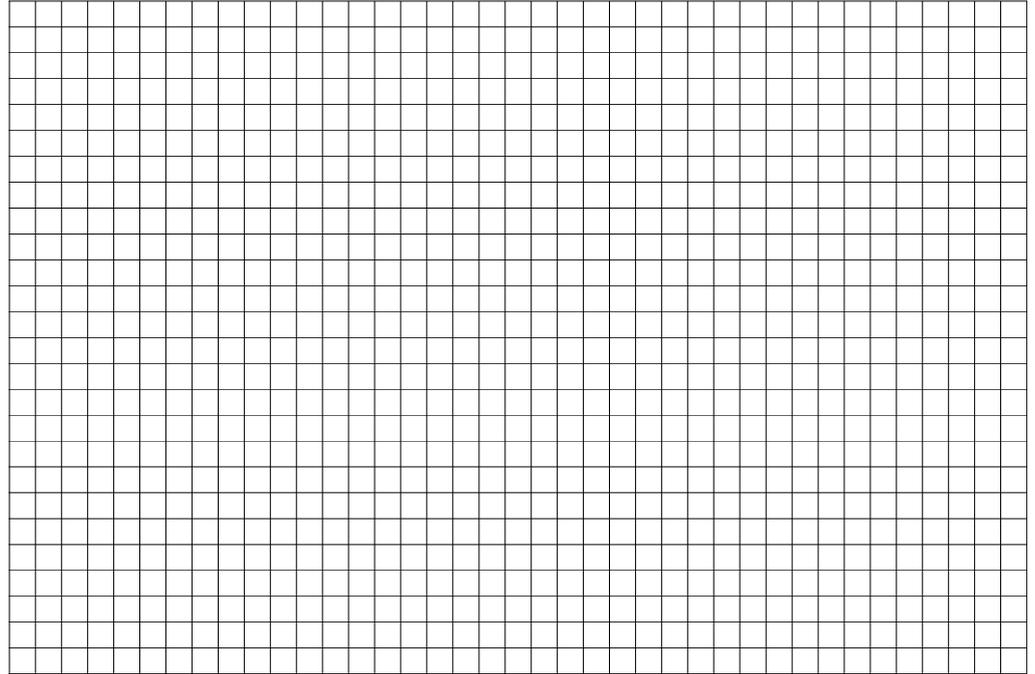
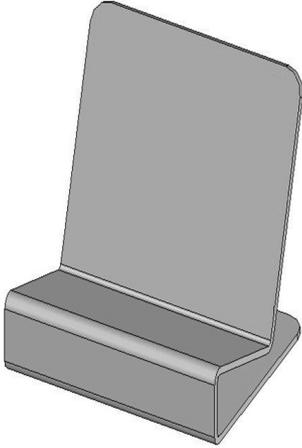
(ii) Name **two** other software applications.

- 1. _____
- 2. _____

Question 2

- (c) In the grid below make well proportioned sketches of an elevation and an end view of the display unit.

6 marks



- (d) When in use the business cards easily slipped off the display unit. Show using a labelled sketch, how you would change the design to prevent the cards falling off.

6 marks

- (e) Designs should be evaluated after manufacture. Give **two** reasons why this should be done. 6 marks

1. _____

2. _____

Question 3

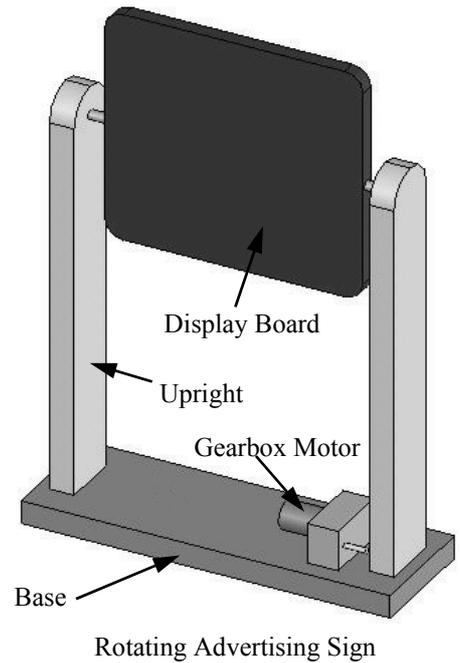
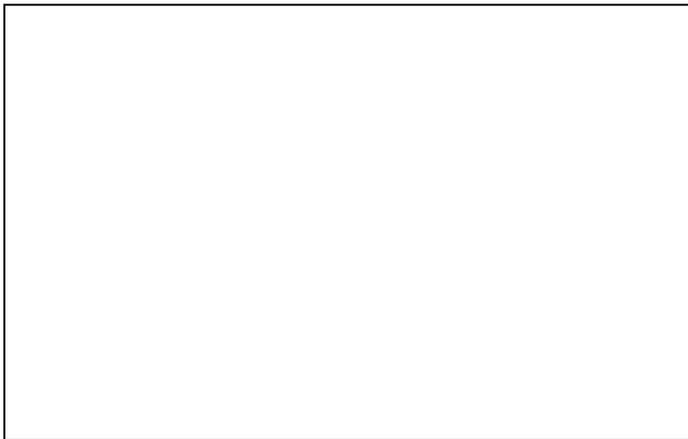
40 Marks

(a) A model of a rotating advertising sign is shown.
The sign is driven by a motorised gearbox.

12 marks

(i) The base and upright are to be made from hardwood.
Name a suitable hardwood for this purpose.

(ii) How would you join the uprights to the base?
Use a sketch to illustrate your answer.



(iii) Name a suitable material for the display board and state how the corners could be rounded.

(iv) What safety precautions should you take when drilling the display board?

(b) (i) A mechanism must be used to join the gearbox to the rotating advertising board.
Choose a mechanism from the following list and give **two** reasons for your choice.
Mechanisms: Cam and follower, chain and sprocket, ratchet and pawl, pulley drive.

8 marks

Selected mechanism: _____

Reasons for choosing: 1. _____

2. _____

(ii) A switch and battery are to be housed in a box made using a vacuum former.
List **two** other items that can be made using a vacuum former.

1. _____

2. _____

Question 3

- (c) (i) The components needed to build the circuit for the rotating advertising sign are shown. Draw the wires to correctly connect the battery holder, switch and motor. 12 marks

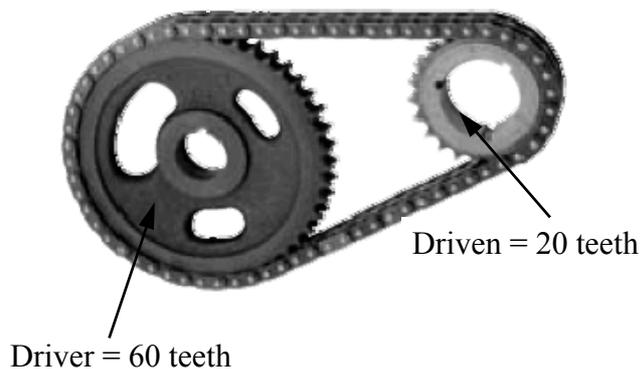


- (ii) Two bulbs are to be used to light up the display at night. Draw the symbol for a bulb and show how both bulb holders can be connected in parallel.

Bulb symbol	Parallel connection

- (iii) Name the components shown.

- (d) In the space opposite calculate the speed of the driven sprocket if the driver is rotating at 20 RPM. 8 marks



Question 4

40 Marks

(a) (i) An old electric washing machine is shown. List **three** features of a modern washing machine that would not have been available in older models.

- 1. _____
- 2. _____
- 3. _____

(ii) Give **three** examples of how technology has changed the way we travel.

- 1. _____
- 2. _____
- 3. _____

(iii) How has computer game technology changed in recent years?



(b) (i) How can a house be made more energy efficient?

12 marks

(ii) Name **one** renewable and **one** non-renewable source of energy.

Renewable: _____

Non-Renewable: _____

(iii) Why should we recycle soft drink cans?

(c) From the history of technology, name **any two** inventors and describe their achievements. 12 marks

Inventor: _____

Inventor: _____
