



Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE 2010

MARKING SCHEME

TECHNOLOGY

ORDINARY LEVEL



Technology

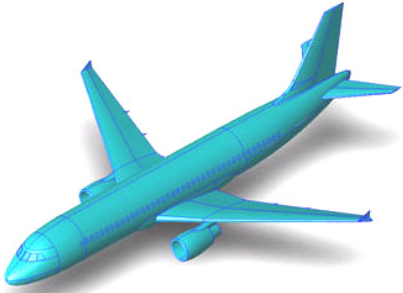



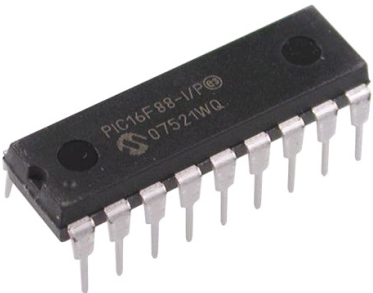
Ordinary Level


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.

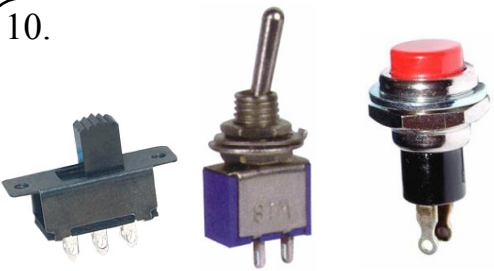
<p>1.</p> 	<p>This drawing of a plane is a(n):</p>	<p>Pictorial view</p>	<p>5</p>
<p>2.</p> 	<p>Guitar strings are in:</p>	<p>Compression</p>	
<p>3.</p> 	<p>SD (Secure Digital) memory cards are commonly used in:</p>	<p>Televisions</p>	
<p>4.</p> 	<p>This is a(n):</p>	<p>LDR</p>	
<p>5.</p> 	<p>In electronics IC stands for:</p>	<p>Industrial Chip</p>	
		<p>Integrated Circuit</p>	<p>5</p>
		<p>Internal Circuit</p>	


6.		Bicycle brakes change a:	Push into a pull	
			Push into a push	
			Pull into a push	⑤

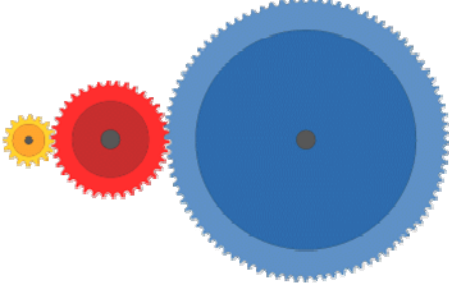
7.		Solar phone chargers are devices that use:	Renewable energy	⑤
			Fossil fuels	
			Geothermal energy	


8.		This is a:	Dividers	
			Scriber	
			Centre punch	⑤


9.		This is a:	Hex nut	⑤
			Square nut	
			Hex bolt	

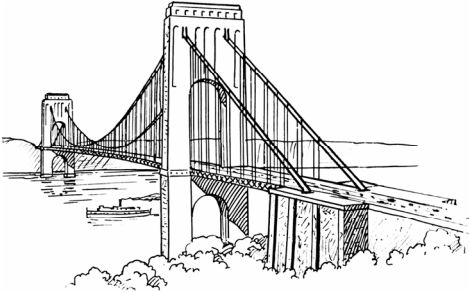
10.	 A B C	Which of these components is a toggle switch?	Component A	
			Component B	⑤
			Component C	


11. 	A jigsaw blade:	Oscillates	
		Reciprocates	⑤
		Rotates	


12. 	The middle gear in this gear train is a(n):	Pinion gear	
		Compound gear	
		Idler gear	⑤


13. 	With regard to the foot-pump the arrow points to the:	Effort	⑤
		Fulcrum	
		Load	


14. 	These are:	Spur gears	
		Bevel gears	⑤
		Worm gears	


15. 	This is a(n):	Arch bridge	
		Beam bridge	
		Suspension bridge	⑤

16.		Power is measured in:	Joules	
			Watts	5
			Volts	

17.		This packaging is:	Cylindrical	5
			Spherical	
			Conical	

18.		TV remote controls use:	Infra Red	5
			Bluetooth	
			Microwave	

19.		Brass is an alloy of:	Gold and silver	
			Copper and Zinc	5
			Lead and tin	

20.		Diggers use:	Electric rams	
			Air powered rams	
			Hydraulic powered rams	5

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

Question 1

40 Marks

(a) The graphic shows a solar powered rotating display. 12 marks

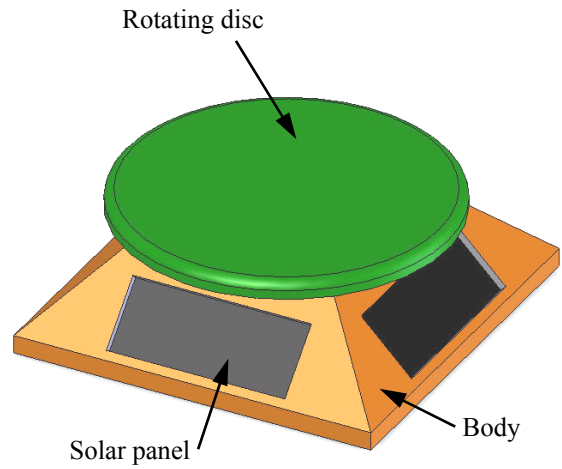
(i) List **two** possible uses for this device.

1. Display a small statue in a museum. ①
2. Display a trophy in a school. ①

(ii) Suggest a suitable material for the rotating disc and give a reason for your choice.

Material: MDF ②

Reason: Easily cut or shaped. ②



Solar powered rotating display

(iii) Describe **three** processes used in the manufacture of the rotating disc.

1. Marking out. ②
2. Cutting with a saw. ②
3. Finishing with sand-paper. ②

(b) (i) The body of the rotating display is vacuum formed. Briefly explain this process. 8 marks

Answer: A sheet of plastic is heated and stretched onto a mould and held against the mould by applying vacuum between the mould surface and the sheet. ④

(ii) Make a neat 3D sketch of the mould needed to vacuum form the body.

Sketch of mould

Weak 1 ←

Fair 2 ←

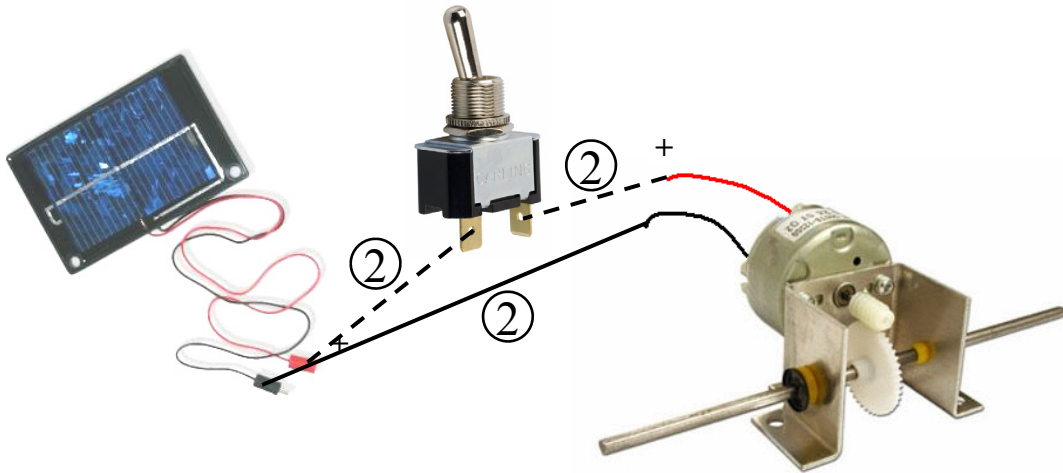
Good 3 ←

Complete 4 ←

Question 1

12 marks

- (c) (i) In this device solar cells are used to power a motorised gearbox that in turn drives the rotating display. The gearbox, switch and one of the solar panels is shown below. Show how these components should be connected in order to power the motor.



- (ii) Name the type of gear system used here and give **two** advantages of its use.

Type of gear system: Worm and wormwheel. (2)

Advantage 1: High mechanical advantage, cheap (2)

Advantage 2: Doesn't slip, quiet. (2)

- (d) (i) Why must thermoplastics be used when vacuum forming?

8 marks

Answer: Because a sheet of thermoplastic material softens when heated. (2)

- (ii) Give **one** advantage and **one** disadvantage of using plastics in manufacturing.

Advantage: Plastics are cheap, flexible, hygienic, attractive, colourful, durable. (2)

Disadvantage: Resulting plastic goods can cause pollution, non-renewable. (2)

- (iii) After vacuum forming the display body, its bottom edge had to be trimmed and properly finished. Briefly explain how you would produce a good quality finish on this edge.

Explanation: File the edge, finish with different grades of sand

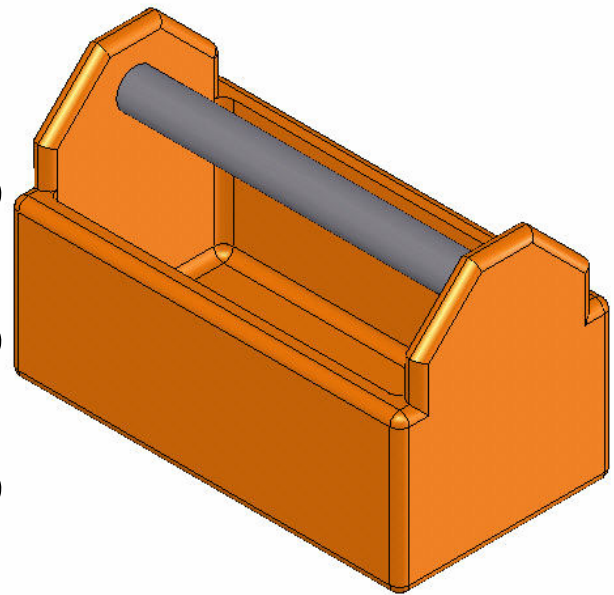
paper and then polish. (2)

Question 2

40 Marks

12 marks

(a) An injection moulded plastic toolbox made in a factory is shown.



Moulded plastic toolbox

(i) List **three** advantages of using plastic to make this toolbox.

1. Cost effective. (2)

2. Produces an attractive finish. (2)

3. Safe edges, mass produced, no waste, etc. (2)

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

Rubber feet or similar. (2)

(v) The toolbox has rounded edges. Suggest **two** reasons for this.

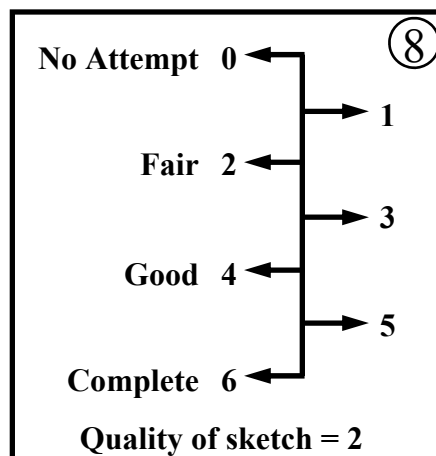
Reason 1: Safety - no sharp edges. (2)

Reason 2: Aesthetics - Looks better. (2)

(b) Using a material of your choice make a sketch of a design for a closed-top toolbox.

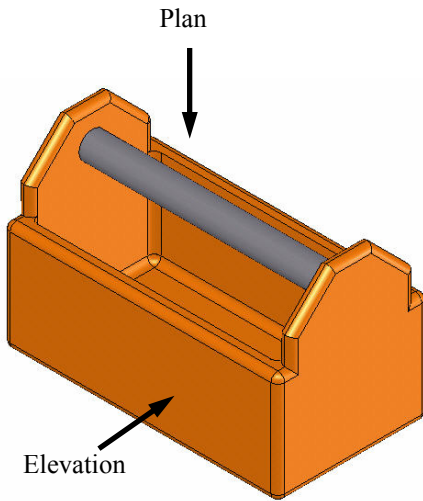
8 marks

Sketch of toolbox



Question 2

- (c) In the grid below make well proportioned sketches of an elevation and a plan view of the toolbox. 8 marks



<p>Weak 1 ←</p> <p>Fair 2 ←</p> <p>Good 3 ←</p> <p>Complete 4 ←</p> <p>Elevation</p>	<p>Weak 1 ←</p> <p>Fair 2 ←</p> <p>Good 3 ←</p> <p>Complete 4 ←</p> <p>Plan</p>
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- (d) Name each of the tools shown below and suggest **one** use for each. 6 marks



Tool: Plane (1)

Use: To produce a smooth (1)

straight surface.



Tool: File (1)

Use: Filing metal. (1)



Tool: Hacksaw (1)

Use: Cutting metal. (1)

- (e) List **three** things that you would need to know before designing a toolbox. 6 marks

1. What will it carry? (2)

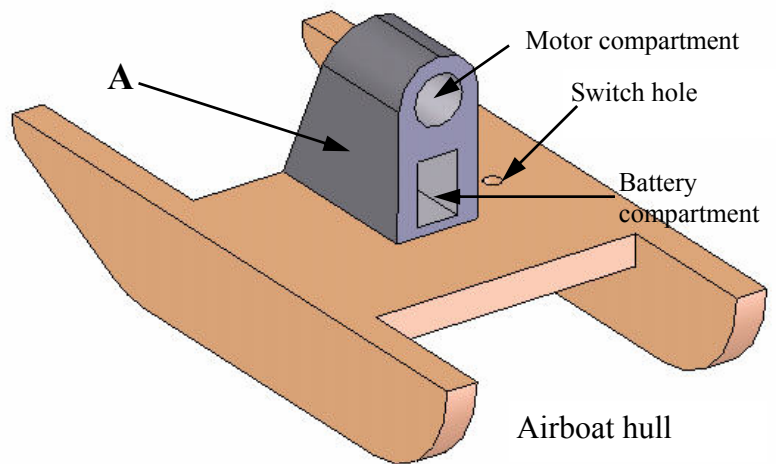
2. Where will it be used? (2)

3. Who will use it? (2)

Question 3

40 Marks

(a) The hull of a motorised propeller driven airboat is shown. Holes for the motor, battery and switch are also shown. 14 marks



(i) Name a suitable lightweight material for the hull and list **three** steps in its manufacture.

Material: PVC foam sheet, Balss ①
wood, Polystyrene, etc.

1. Marking out. ②

2. Cutting ②

3. Finishing ②

(ii) Name a suitable material for the motor and battery housing (A) and give a reason for your choice.

Material: Wood, plastic, lightweight metal ①

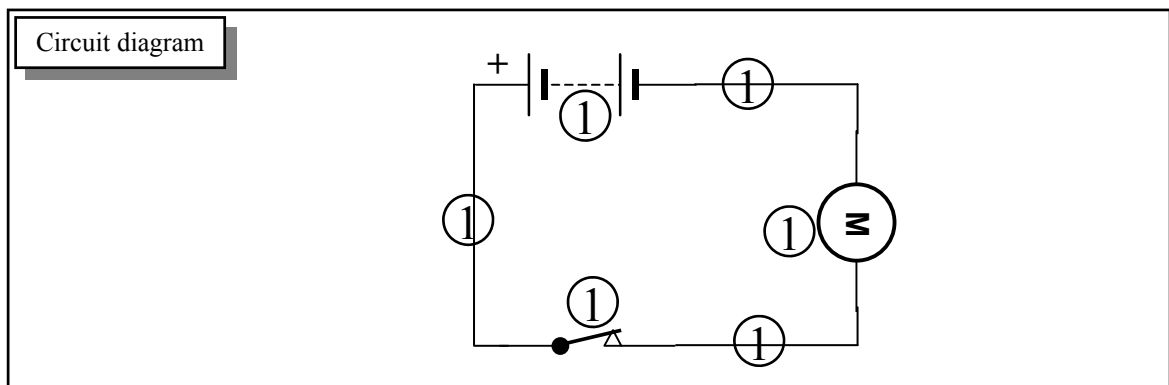
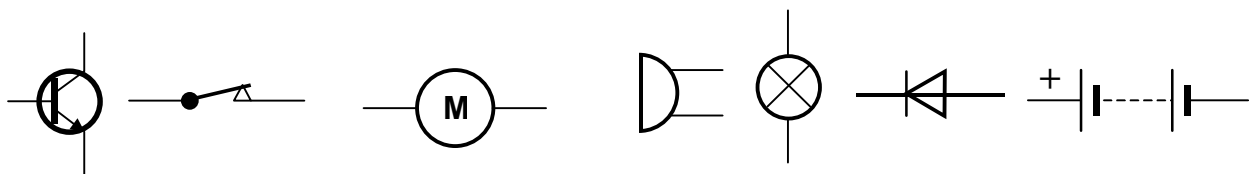
Reason: Available and easily worked to shape. ②

(iii) List **two** important design features that take into account the operation of the airboat on water.

1. Lightweight ②

2. Stability ②

(b) A number of symbols are shown. Select the correct symbols for the switch, battery and motor then draw the circuit diagram for the airboat. 6 marks



Question 3

- (c) (i) When the propeller shown was fitted to the motor, the airboat was found to be unsafe to operate. In the space below sketch a guard for the propeller which would make the airboat safe to use.

12 marks



Propeller

Motor

Sketch

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

- (ii) Safety is very important in the technology workshop. List **four** safety precautions that must be observed in your day to day work in the technology room.

1. Wear safety glasses when operating machinery. (2)
2. Turn off drill when finished drilling. (2)
3. Always make sure that machine guards are in place. (2)
4. Do not run in the Technology room. (2)

- (d) (i) Airboats are used in search and rescue missions on water throughout the world. In the space opposite make a sketch of your design for a logo for such a search and rescue airboat.

8 marks

Logo design

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

- (ii) Many manufactured products have a logo on them or on their packaging. List **two** reasons why companies use logos.

Reason 1. Advertising. (2)

Reason 2. To add to the overall look of the product. (2)

Question 4

40 Marks

(a) 16 marks

(i) Shopping in the supermarket is now a very different experience to what it was some years ago. Suggest **three** ways in which technology has improved the shopping experience.

1. Bar code scanning devices are commonly used today. ④

2. Self-service checkout systems are now in place in some supermarkets. ③

3. Payment can now be made with plastic cards, touch-screen technology etc. ③

(ii) Using **two** examples explain how the Internet has changed the way we shop.

1. Shop online instead of going to a town or city to shop. ③

2. Can shop online 24 hours a day, everyday. ③


(b) 12 marks

(i) The way in which we use fossil fuels for travel must change. Suggest **three** reasons for this change.

1. Global warming. ②

2. Pollution in our cities. ②

3. Increased cost of fossil fuels. ②



(ii) List **three** ways that we can improve the manner in which we deal with our waste materials.

1. Recycle as much waste as we can. ②

2. Use less packaging. ②

3. Compost organic materials. ②

(c) 12 marks

Home entertainment systems have improved greatly in recent years. Using at least **two** examples discuss how home entertainment systems have changed and improved.

Example 1: Portable MP3 players ②

These MP3 players have become lighter and smaller. ②

The storage capacity of these devices has increased enormously. ②

Example 2: TV ②

High definition TV is now a common standard. ②

TV screens are now much larger and use LCD or LED technology. ②