



**Coimisiún na Scrúduithe Stáit  
State Examinations Commission**

*Junior Certificate Examinations, 2004*

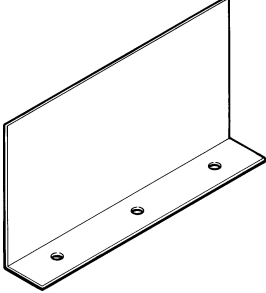
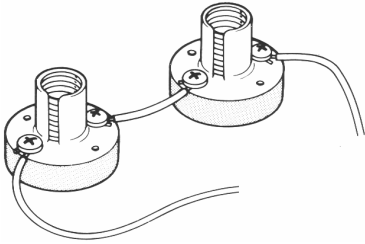
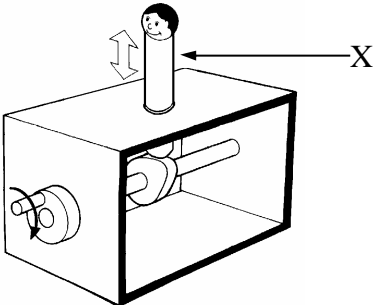

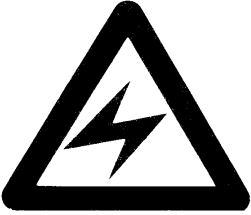
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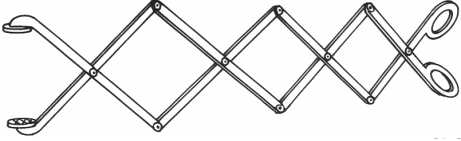
***TECHNOLOGY***

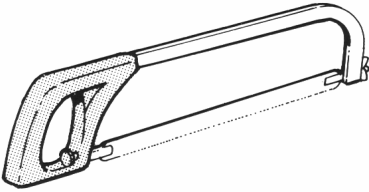
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*ORDINARY LEVEL*


***Marking  
Scheme***

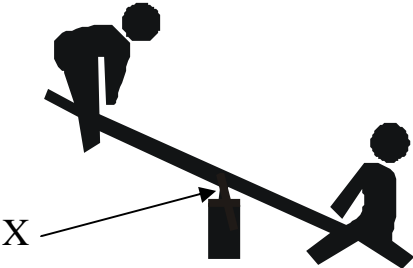
<p>1.</p> 	<p>This part is shown in:</p>	<p>Orthographic</p>	
		<p>Isometric</p>	<p>5</p>
		<p>Oblique</p>	
<p>2.</p> 	<p>The bulb holders are connected in:</p>	<p>Parallel</p>	
		<p>Series</p>	<p>5</p>
		<p>Series and Parallel</p>	
<p>3.</p> 	<p>Part 'X':</p>	<p>Rotates</p>	
		<p>Reciprocates</p>	<p>5</p>
		<p>Oscillates</p>	
<p>4.</p> 	<p>Ash is a:</p>	<p>Hardwood</p>	<p>5</p>
		<p>Softwood</p>	
		<p>Manufactured Wood</p>	
<p>5.</p> 	<p>This symbol warns of a(n):</p>	<p>Fire Hazard</p>	
		<p>Chemical Hazard</p>	
		<p>Electrical Hazard</p>	<p>5</p>


<p>6.</p> 	<p>This lazy tongs uses a:</p>	Reverse Motion Linkage	
		Parallel Linkage	5
		Bell Crank Linkage	

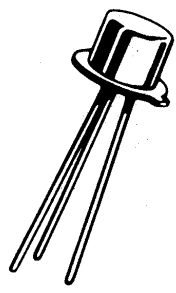
<p>7.</p> 	<p>This tool is a:</p>	Coping Saw	
		Fret Saw	
		Hacksaw	5

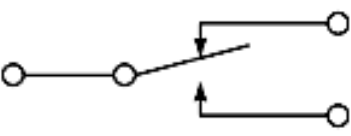
<p>8.</p> 	<p>Computer data is measured in:</p>	Bits	
		Bytes	5
		Pixels	

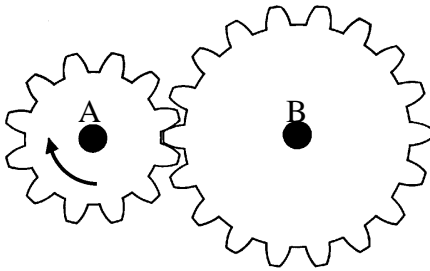
<p>9.</p> 	<p>Bicycles use a:</p>	Pulley Drive	
		Gear Train Drive	
		Sprocket & Chain Drive	5

<p>10.</p> 	<p>Point 'X' is the:</p>	Load	
		Fulcrum	5
		Effort	

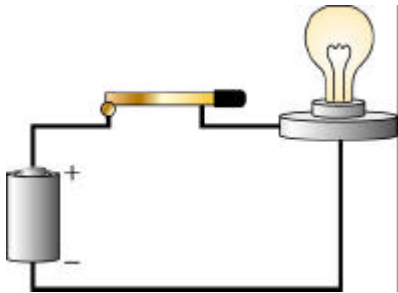
11.		These are:	Spur Gears	
			Helical Gears	
			Bevel Gears	5

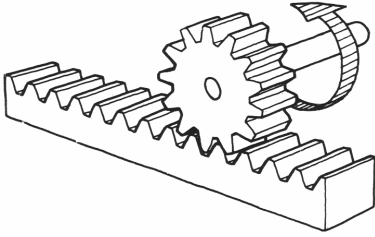
12.		This electronic component is a:	Diode	
			Resistor	
			Transistor	5

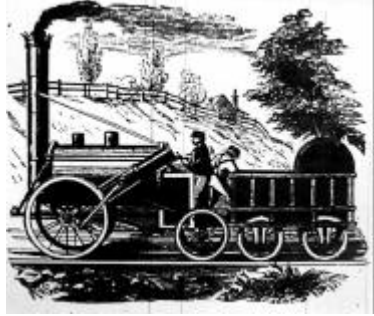
13.		This symbol represents a:	SPST Switch	
			DPDT Switch	
			SPDT Switch	5

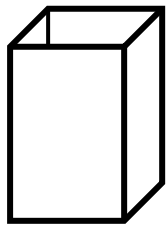
14.	 <p>A = 12 Teeth      B = 18 Teeth</p>	If gear A rotates at 150 RPM, gear B will rotate at:	100 RPM	5
			150 RPM	
			250 RPM	

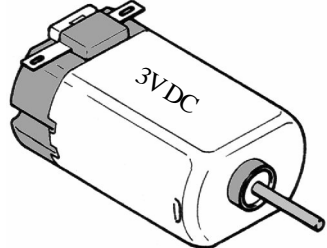
15.	<table border="1"> <thead> <tr> <th>A</th> <th>B</th> <th>Q</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	A	B	Q	0	0	0	0	1	1	1	0	1	1	1	1	This is the truth table for a(n):	AND Gate	
		A	B	Q															
		0	0	0															
0	1	1																	
1	0	1																	
1	1	1																	
NOT Gate																			
OR Gate	5																		

16. 	Current is measured in:	Volts	
		Ohms	
		Amps	5

17. 	This mechanism is a:	Ratchet and Pawl	
		Rack and Pinion	5
		Crank and Slider	

18. 	The steam engine was developed by:	Thomas Edison	
		George Stephenson	5
		Nicholas Otto	

19. 	Draw the surface development of this open-top container.  <i>1 mark for each surface shown.</i>
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20. 	What do the letters DC represent? <span style="float: right;">5</span>  <u>Direct Current</u>
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**SECTION B – 80 MARKS**  
**ANSWER ANY TWO QUESTIONS FROM THIS SECTION**

1.

40 Marks

(a) A motor driven toy buggy is shown. Acrylic was selected as a suitable material for the side

14 Marks

(i) Give **two** reasons for selecting acrylic.

② 1. Aesthetics, safe, lightweight.

\_\_\_\_\_

② 2. Easily shaped & bent.

\_\_\_\_\_

(ii) Name the drive mechanism 'X'.

② Pulley or Belt or Pulley & Belt

\_\_\_\_\_

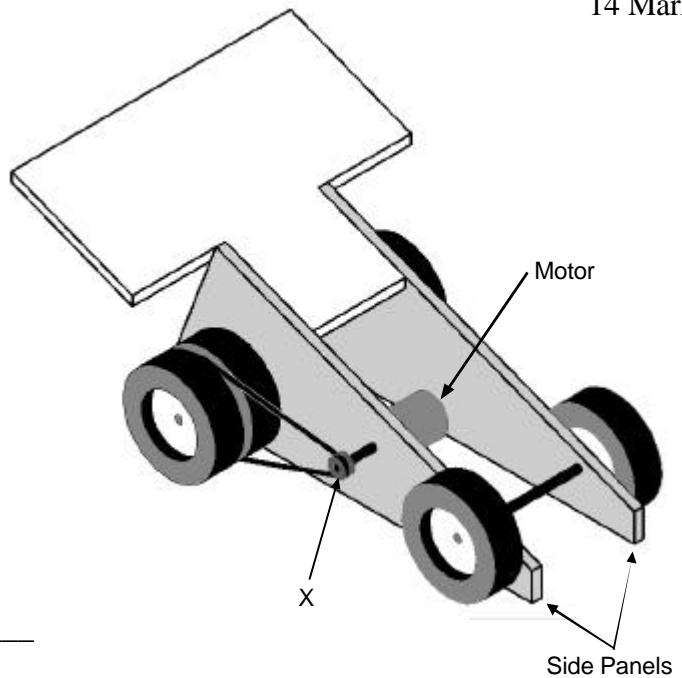
(iii) List **four** stages in the manufacture of the side panels.

② 1. Marking out

② 2. Cutting

② 3. Drilling

② 4. Filing, sanding, polishing.



(b) (i) List **two** advantages of using drive mechanism 'X'.

8 Marks

② 1. Easily manufactured, easily fitted, no lubrication required.

② 2. Low cost, can be used in both directions, will not wear, speed reduction.

(ii) Suggest an alternative drive mechanism for the toy buggy.

② Gears, chain & sprocket.

\_\_\_\_\_

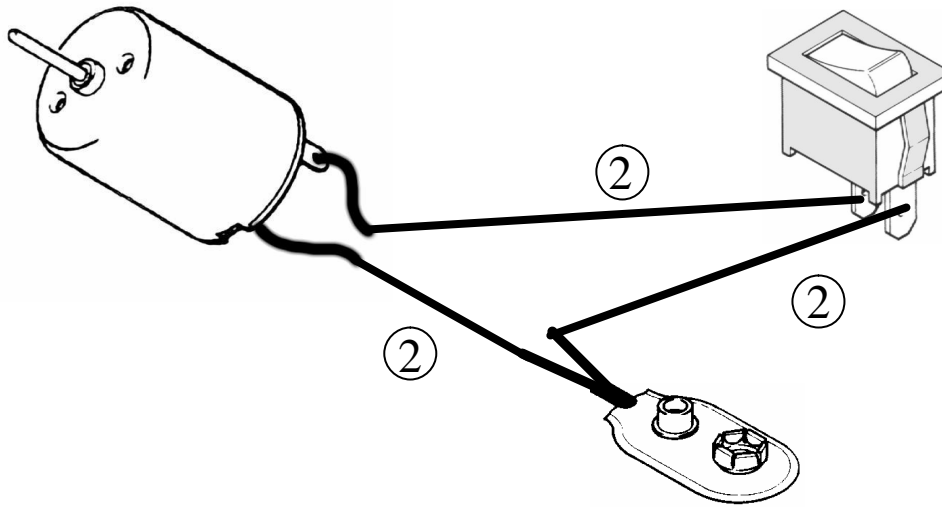
(iii) How would you prevent the wheels from rubbing against the side panels?

② Put a spacer between the wheels and side panels. Washers.

\_\_\_\_\_

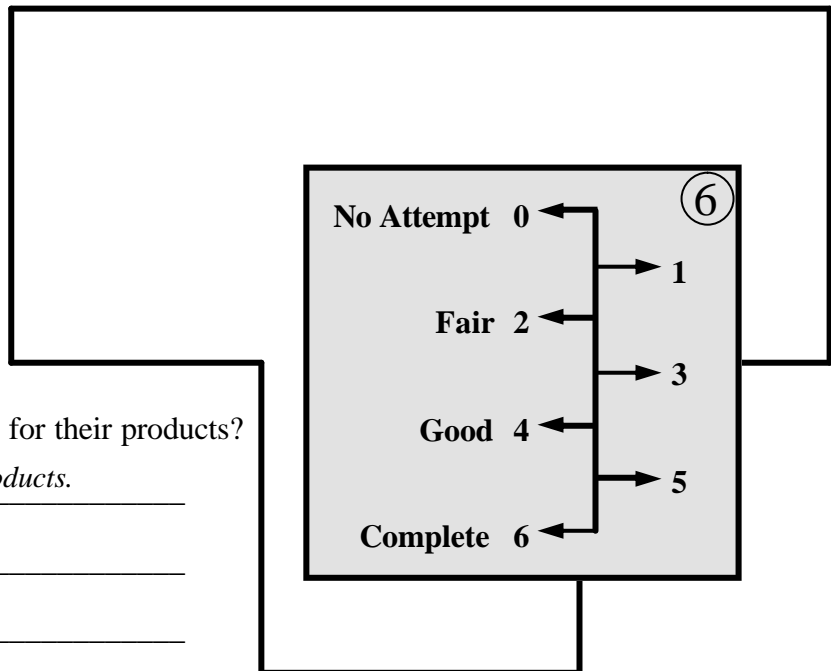
6 Marks

(c) The components used to control the toy buggy are shown.  
Draw the wires necessary to complete the circuit.



(d) (i) In the space provided draw a logo for the toy buggy.

8 Marks



(ii) Why do companies use logos for their products?

- ② To make people buy their products.
- Looks good, eye-catching
- Advertising, marketing.
- \_\_\_\_\_
- \_\_\_\_\_

4 Marks

(e) Suggest **two** ways in which the toy buggy could be improved to make it safer for young children.

- ② 1. Round sharp corners. Safer wheel design and assembly.
- \_\_\_\_\_
- \_\_\_\_\_
- ② 2. Hide, secure moving and electrical components.
- \_\_\_\_\_
- \_\_\_\_\_

(a) A drawing of a soil moisture tester is shown.

10 Marks

(i) Name a suitable metal that should be used to make the rods. Give a reason for your choice.

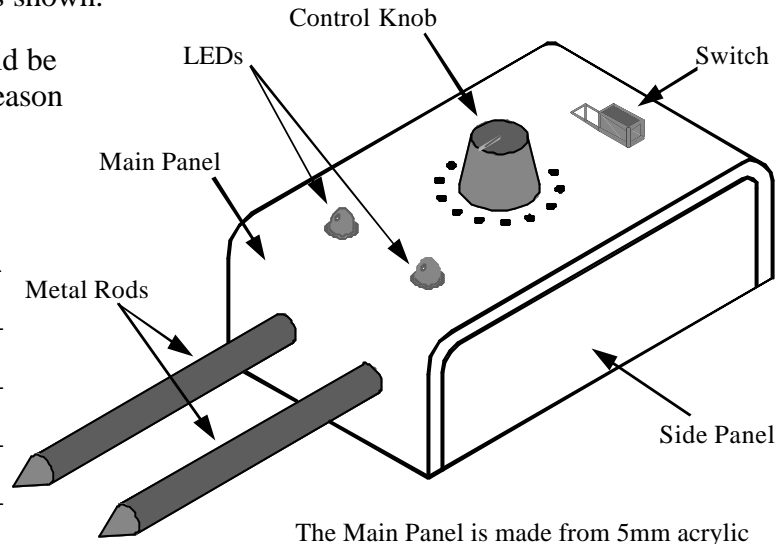
③ Metal: Copper, Alum, Brass.

③ Reason: \_\_\_\_\_

Good conductor.

Does not rust.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



(ii) Describe how the slot for the switch is formed.

② \_\_\_\_\_  
Drill holes and file to shape.

\_\_\_\_\_  
 \_\_\_\_\_

(iii) What precautions should be taken when drilling acrylic?

② \_\_\_\_\_  
Wear safety gear, hold work securely.

\_\_\_\_\_  
 \_\_\_\_\_

(b) Complete the development of the main panel.

8 Marks

	<p style="font-size: 24px; font-weight: bold;">⑧</p> <p>No Attempt 0 ←</p> <p style="margin-left: 40px;">→ 1</p> <p>Fair 2 ←</p> <p style="margin-left: 40px;">→ 3</p> <p>Good 4 ←</p> <p style="margin-left: 40px;">→ 5</p> <p>Complete 6 ←</p> <p>Quality of sketch = 2</p>	
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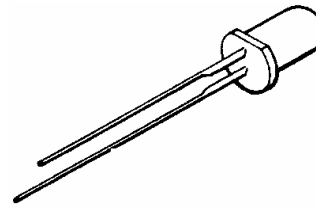


(c) (i) What do the letters LED represent?

③ Light Emitting Diode

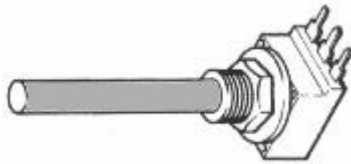
(ii) Why is one leg of the LED longer than the other?

③ Identifies polarity.  
\_\_\_\_\_



(iii) Name this electronic component and select a symbol from the chart.

② Switch., variable resistor.




(d) (i) Describe how the main panel is bent to shape.

③ Description of using a strip heater.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(ii) List **three** steps necessary to get a good finish on the edge of the acrylic.

- ① 1. Plane
- ① 2. File smoothly, polish.
- ① 3. Finish with steel wool, wet & dry..

(e) (i) Name a material suitable for the base.

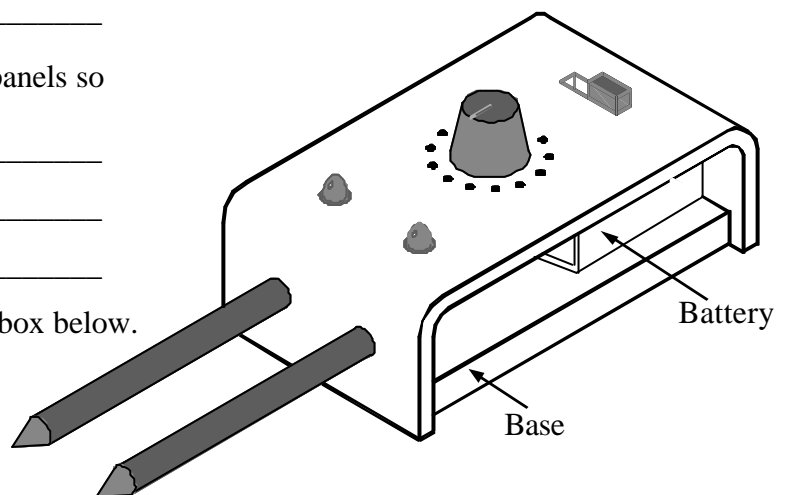
③ Wood.

(ii) Suggest a method of fixing the side panels so that the battery can be replaced.

③ Appropriate fixing method.  
\_\_\_\_\_

(iii) Draw the symbol for a battery in the box below.

②



(a) A drawing of a model airboat is shown.

12 Marks

(i) Name a material suitable for the hull and list **two** properties of this material.

② Material: Expanded Polystyrene

② Property 1: Lightweight

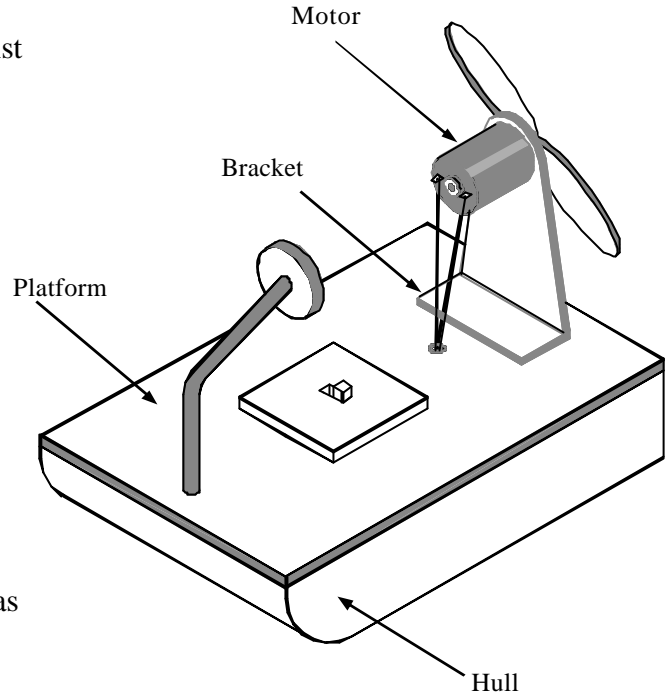
\_\_\_\_\_

\_\_\_\_\_

② Property 2: Easily shaped

\_\_\_\_\_

\_\_\_\_\_



(ii) Give **two** reasons why aluminium sheet was used to make the bracket.

① Strong.

① Does not rust.

(iii) List **four** stages in the manufacture of the bracket.

① 1. Marking out, drilling, polishing, sanding.

① 2. Cutting

① 3. Filing

① 4. Bending

(b) (i) When tested the propeller rotated in the wrong direction. State how this problem can be corrected.

8 Marks

② Reverse the motor connections.

\_\_\_\_\_

\_\_\_\_\_

② (ii) What process should be used to attach the wires to the motor? Soldering

(iii) List **two** safety precautions relating to this process.

② 1. Wear safety glasses.

② 2. Work in a well ventilated area.

8 Marks

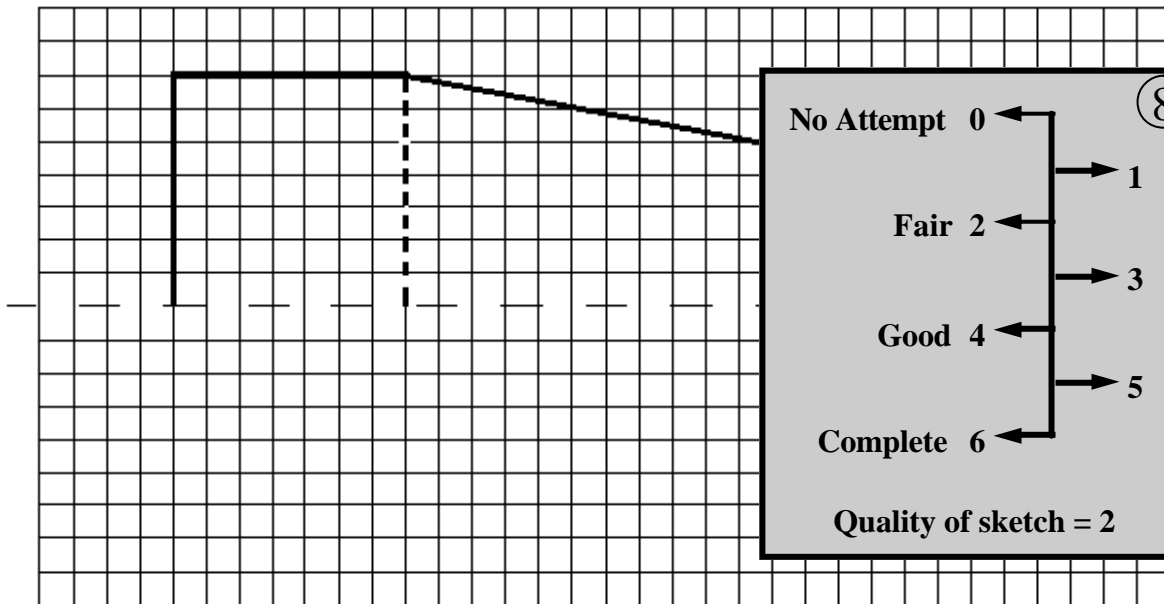
(c) Draw a detailed sketch of a safety cage for the propeller.



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

8 Marks

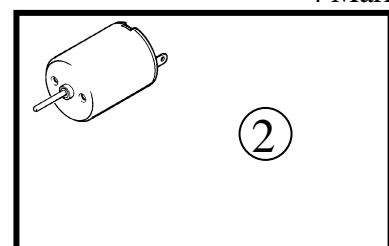
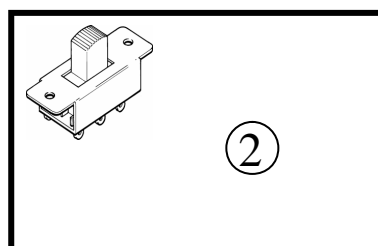
(d) Complete the development of the bracket.



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

4 Marks

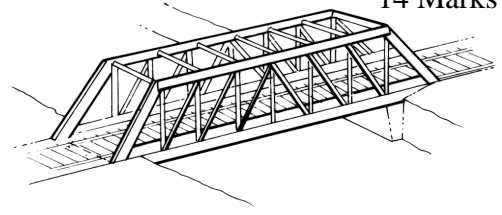
(e) In the boxes draw the circuit symbols for the **Switch** and **Motor**.



(a) (i) This bridge is an example of a frame structure.

14 Marks

Give **two** other examples of frame structures.



②

1. Gates, scaffolding, window & door frame.

②

2. Roofs of houses, cranes.

(ii) Various forces can be applied to a frame structure. Name **two** such forces.

②

1. Tension, shear, torsion, bending.

②

2. Compression.

(iii) Why are triangles used in frame structures?

②

Because the triangles make the structure stronger.

(iv) Give **two** examples of shell structures.

②

1. Car bodies, boats, bucket, ball.

②

2. Egg boxes, corrugated sheet.

(b) (i) Name **two** forms of non-renewable energy.

12 Marks

②

1. Coal, nuclear, turf.

②

2. Oil

(ii) Name **two** forms of renewable energy.

②

1. Wind, solar, geothermal, wave.

②

2. Hydroelectric

(iii) Suggest **two** ways of reducing the amount of energy we use.

②

1. Better insulation

②

2. Turn off lights when not needed.

(c) (i) List **two** ways in which modern technology has benefited agriculture.

8 Marks

②

1. GPS, more efficient machinery.

②

2. Pest control. Animal welfare.

(ii) List **two** ways in which technology can be used to extend the shelf life of dairy products.

②

1. Better packaging.

②

2. Use of display fridges.

(d) In relation to waste explain the terms Reduce, Recycle, and Reuse. Give **one** example of each.

6 Marks

①

1. Reduce: Cut down the amount of packaging we use.

①

Example: Buy loose vegetables.

①

2. Recycle: Reprocessing of materials.

①

Example: Glass bottles.

①

3. Reuse: Use an item over and over again.

①

Example: Buy a reusable bag instead of a disposable one.