



**Coimisiún na Scrúduithe Stáit
State Examinations Commission**

Junior Certificate Examination 2004

TECHNOLOGY

ORDINARY LEVEL

160 Marks

Wednesday 23 June, Afternoon, 2.00 to 4.00

Centre Number

Examination Number

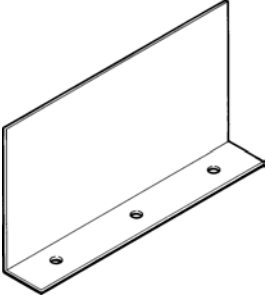
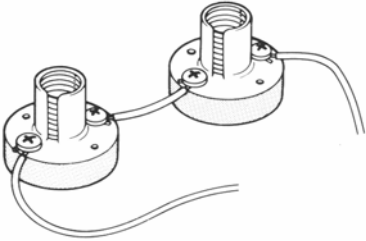
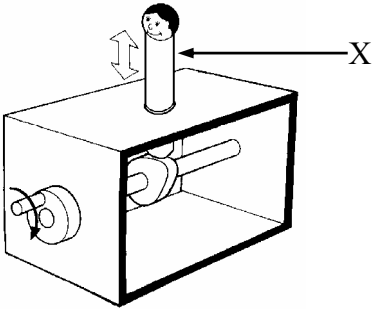

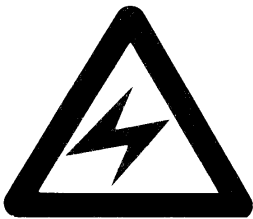
INSTRUCTIONS

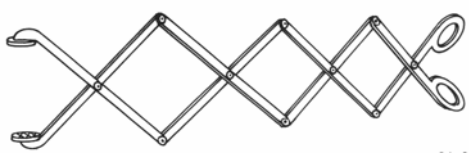
1. Answer Section A and any two questions from Section B.
2. Write your answers in the spaces provided or tick the appropriate box.
3. Hand up this paper at the end of the examination.

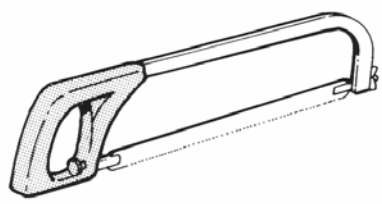
| | | |
|----|--|--|
| 1. | Total of end of page totals | |
| 2. | Aggregate total of all disallowed question(s) | |
| 3. | Total mark awarded (1 minus 2) | |
| 4. | Bonus mark for answering through Irish (if applicable) | |
| 5. | Total mark awarded if Irish Bonus (3+4) | |
| | Note: The mark in row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


| For Examiner | |
|--------------|----------------------|
| Total Mark | <input type="text"/> |
| Question | Mark |
| Section A | |
| Section B Q1 | |
| Section B Q2 | |
| Section B Q3 | |
| Section B Q4 | |
| Total | |
| Grade | |


MAKE SURE TO WRITE YOUR EXAMINATION NUMBER IN THE BOX PROVIDED ON THIS PAGE

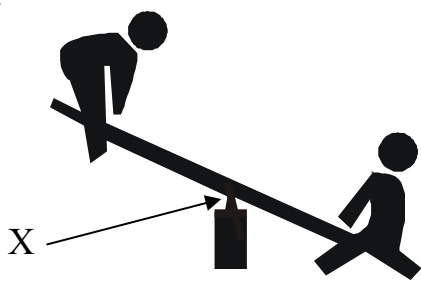
| | | | |
|---|---|----------------------------|--|
| <p>1.</p>  | <p>This part is shown in:</p> | <p>Orthographic</p> | |
| | | <p>Isometric</p> | |
| | | <p>Oblique</p> | |
| <p>2.</p>  | <p>The bulb holders are connected in:</p> | <p>Parallel</p> | |
| | | <p>Series</p> | |
| | | <p>Series and Parallel</p> | |
| <p>3.</p>  | <p>Part 'X':</p> | <p>Rotates</p> | |
| | | <p>Reciprocates</p> | |
| | | <p>Oscillates</p> | |
| <p>4.</p>  | <p>Ash is a:</p> | <p>Hardwood</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> | |

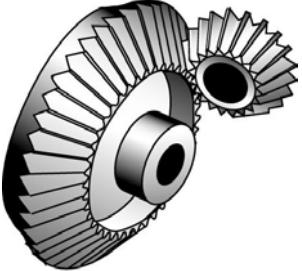
| | | | |
|---|-------------------------|------------------------|--|
| 6.  | This lazy tongs uses a: | Reverse Motion Linkage | |
| | | Parallel Linkage | |
| | | Bell Crank Linkage | |

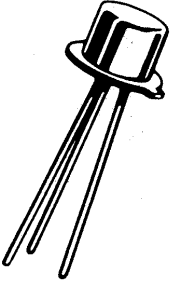
| | | | |
|---|-----------------|------------|--|
| 7.  | This tool is a: | Coping Saw | |
| | | Fret Saw | |
| | | Hacksaw | |

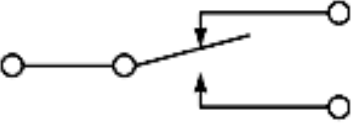
| | | | |
|--|-------------------------------|--------|--|
| 8.  | Computer data is measured in: | Bits | |
| | | Bytes | |
| | | Pixels | |

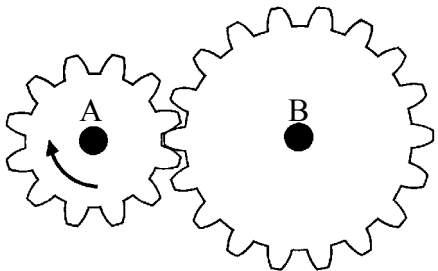
| | | | |
|---|-----------------|------------------------|--|
| 9.  | Bicycles use a: | Pulley Drive | |
| | | Gear Train Drive | |
| | | Sprocket & Chain Drive | |

| | | | |
|--|-------------------|---------|--|
| 10.  | Point 'X' is the: | Load | |
| | | Fulcrum | |
| | | Effort | |

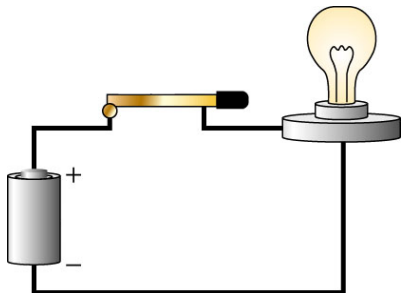
| | | | |
|---|------------|---------------|--|
| 11.  | These are: | Spur Gears | |
| | | Helical Gears | |
| | | Bevel Gears | |

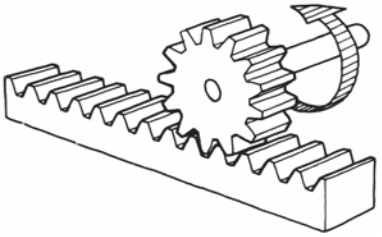
| | | | |
|---|---------------------------------|------------|--|
| 12.  | This electronic component is a: | Diode | |
| | | Resistor | |
| | | Transistor | |

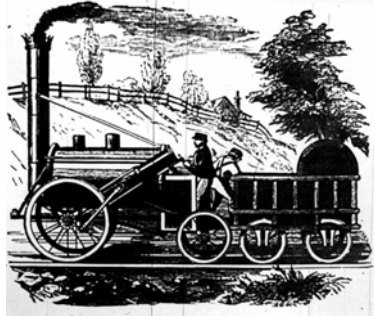
| | | | |
|---|---------------------------|-------------|--|
| 13.  | This symbol represents a: | SPST Switch | |
| | | DPDT Switch | |
| | | SPDT Switch | |

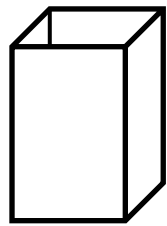
| | | | |
|---|--|---------|--|
| 14.  A = 12 Teeth B = 18 Teeth | If gear A rotates at 150 RPM, gear B will rotate at: | 100 RPM | |
| | | 150 RPM | |
| | | 250 RPM | |

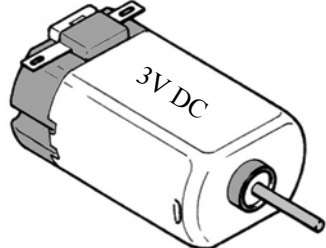
| 15. <table border="1"> <thead> <tr> <th>A</th> <th>B</th> <th>Q</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table> | A | B | Q | 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 | | | | | | | | | | | | | | | | | | |

| | | | |
|--|-------------------------|-------|--|
| <p>16.</p>  | Current is measured in: | Volts | |
| | | Ohms | |
| | | Amps | |

| | | | |
|--|----------------------|------------------|--|
| <p>17.</p>  | This mechanism is a: | Ratchet and Pawl | |
| | | Rack and Pinion | |
| | | Crank and Slider | |

| | | | |
|---|------------------------------------|-------------------|--|
| <p>18.</p>  | The steam engine was developed by: | Thomas Edison | |
| | | George Stephenson | |
| | | Nicholas Otto | |

| | |
|--|--|
| <p>19.</p>  | Draw the surface development of this open-top container. |
|--|--|

| | |
|--|---|
| <p>20.</p>  | <p>What do the letters DC represent?</p> <p>_____</p> |
|--|---|

SECTION B – 80 MARKS
ANSWER ANY TWO QUESTIONS FROM THIS SECTION

1.

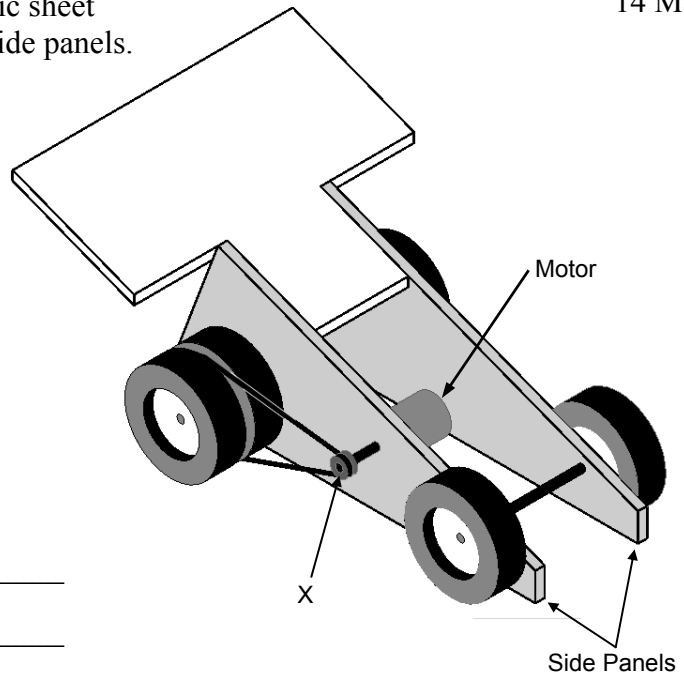
40 Marks

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

14 Marks

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

1. _____
- _____
2. _____
- _____



(ii) Name the drive mechanism 'X'.

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

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

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

8 Marks

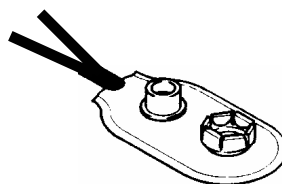
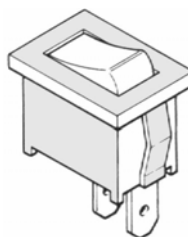
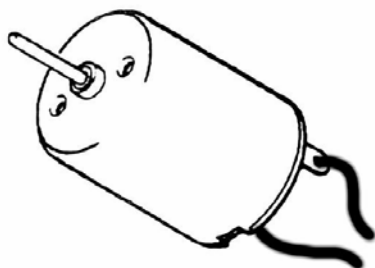
1. _____
2. _____

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

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

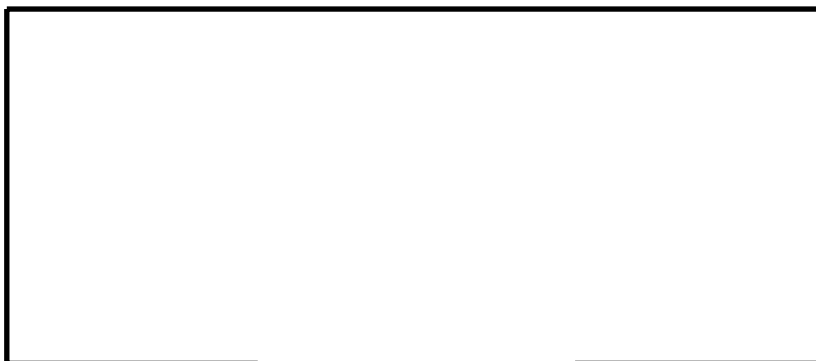
6 Marks

(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?

4 Marks

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

1. _____

2. _____

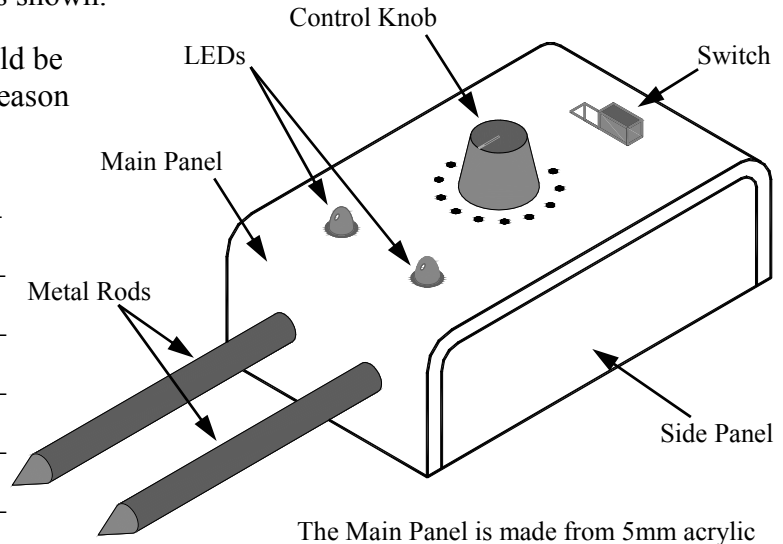
(a) A drawing of a soil moisture tester is shown.

10 Marks

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

Metal: _____

Reason: _____



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

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

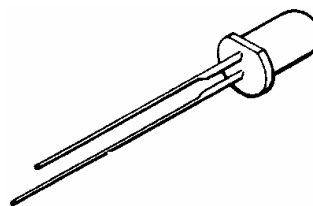
(b) Complete the development of the main panel.

8 Marks

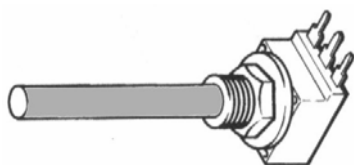


(c) (i) What do the letters LED represent?

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



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



| | |
|--|--|
| | |
| | |
| | |

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

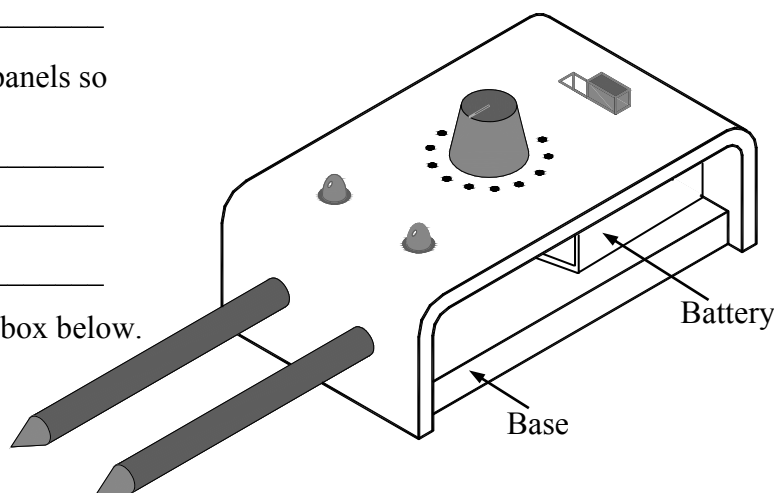
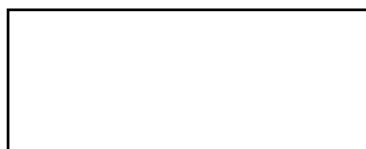
(ii) List **three** steps necessary to get a good finish on the edge of the acrylic.

1. _____
2. _____
3. _____

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

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

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



3.

40 Marks

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

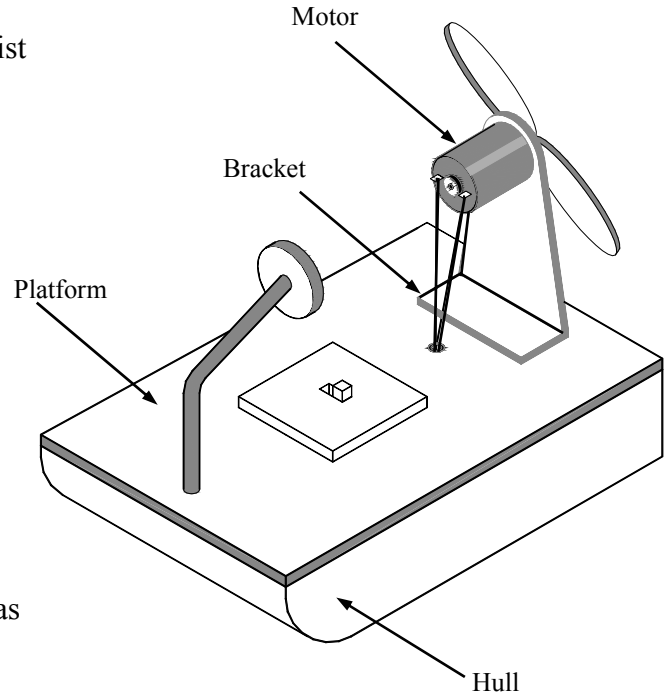
12 Marks

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

Material: _____

Property 1: _____

Property 2: _____



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

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

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

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

8 Marks

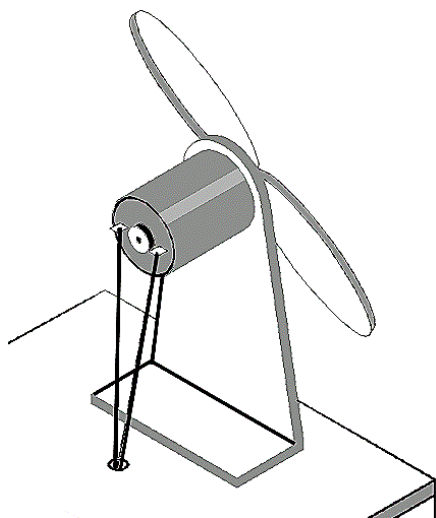
(ii) What process should be used to attach the wires to the motor? _____

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

1. _____
2. _____

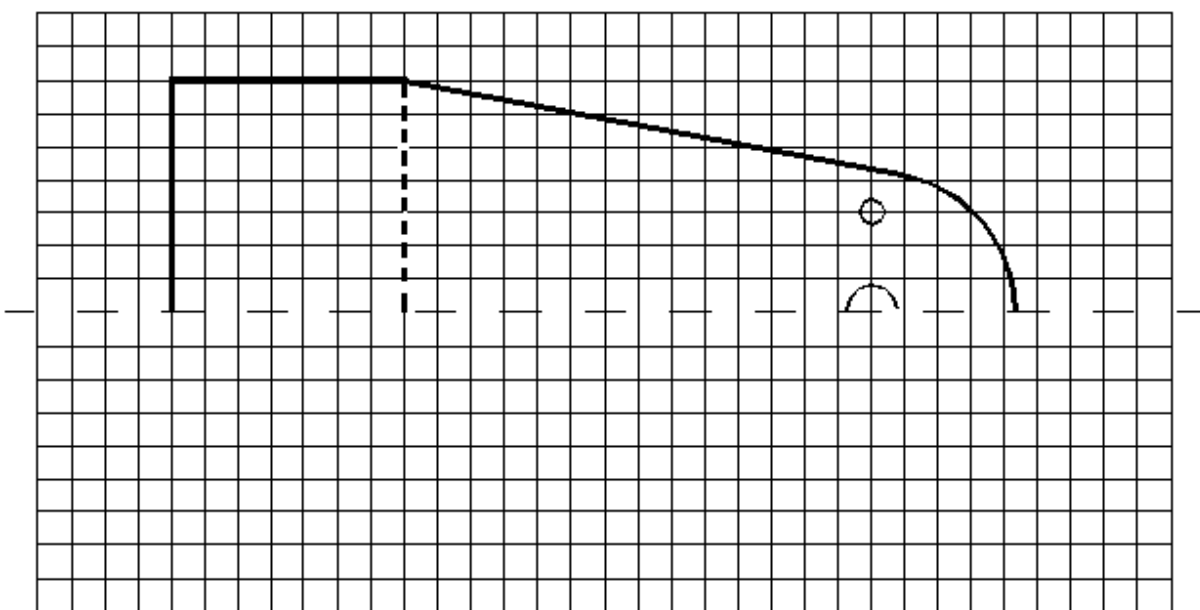
8 Marks

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



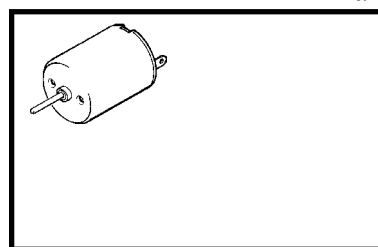
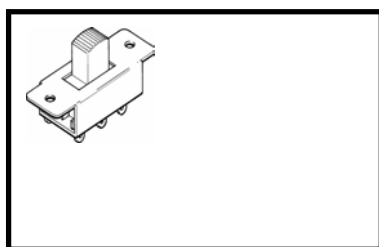
8 Marks

(d) Complete the development of the bracket.



4 Marks

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



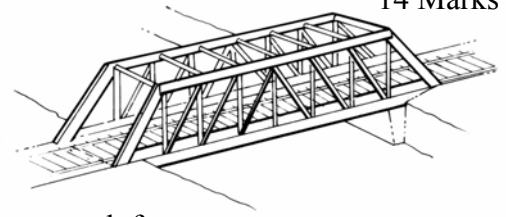
(a) (i) This bridge is an example of a frame structure.

14 Marks

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

1. _____

2. _____



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

1. _____

2. _____

(iii) Why are triangles used in frame structures?

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

1. _____

2. _____

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

12 Marks

1. _____

2. _____

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

1. _____

2. _____

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

1. _____

2. _____

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

8 Marks

1. _____

2. _____

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

1. _____

2. _____

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

6 Marks

1. Reduce: _____

Example: _____

2. Recycle: _____

Example: _____

3. Reuse: _____

Example: _____