



Coimisiún na Scrúduithe Stáit
State Examinations Commission

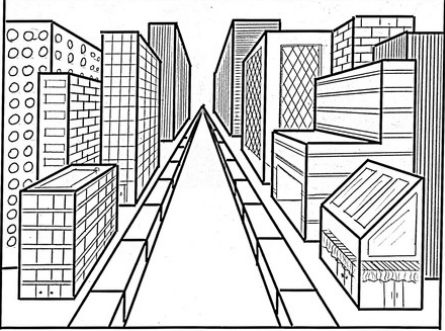




JUNIOR CERTIFICATE 2008


MARKING SCHEME


TECHNOLOGY

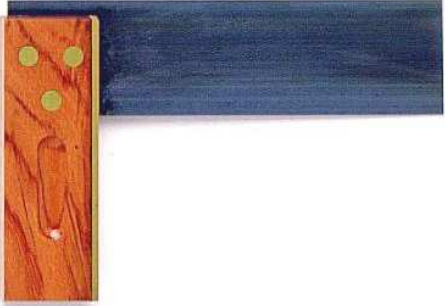
ORDINARY LEVEL


SECTION A – 80 MARKS ANSWER ANY SIXTEEN QUESTIONS IN THIS SECTION


<p>1.</p> 	<p>This drawing is a(n):</p>	<p>Plan</p>	
		<p>Perspective projection</p>	<p>5</p>
		<p>Isometric projection</p>	
<p>2.</p> 	<p>Copper and tin are used to produce:</p>	<p>Brass</p>	
		<p>Aluminium alloy</p>	
		<p>Bronze</p>	<p>5</p>
<p>3.</p> 	<p>This is a:</p>	<p>USB flash drive</p>	<p>5</p>
		<p>Floppy drive</p>	
		<p>ZIP drive</p>	
<p>4.</p> 	<p>This is a:</p>	<p>Thermistor</p>	
		<p>Diode</p>	
		<p>Variable resistor</p>	<p>5</p>
<p>5.</p> 	<p>Alessandro Volta invented the first:</p>	<p>Motor</p>	
		<p>Battery</p>	<p>5</p>
		<p>Light bulb</p>	


6. 	The strings in a tennis racket are in:	Torsion	
		Compression	
		Tension	5


7. 	A solar cell converts:	Light into electricity	5
		Electricity into light	
		Sound into electricity	


8. 	The try square is a:	Cutting tool	
		Setting out tool	5
		Shaping tool	


9. 	This is a:	Centre punch	
		Scraper	
		Scriber	5

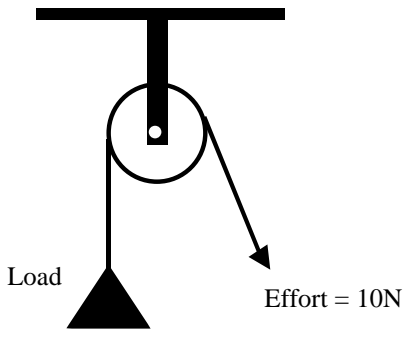
10. 	To make the bicycle frame stronger, designers make use of:	Triangulation	5
		Surface finishing	
		Parallelogram shapes	

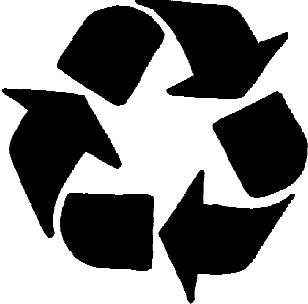
11.		This is a:	Worm and worm wheel	
			Crank and slider	
			Ratchet and pawl	5

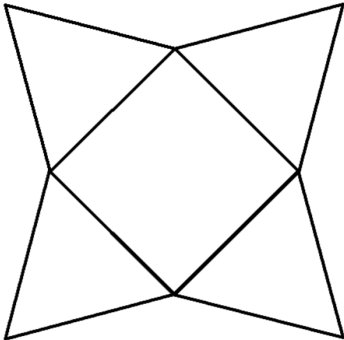
12.		The chuck and key mechanism is a:	Simple gear train	
			Bevel gear system	5
			Compound gear train	


13.		In the picture of the nut cracker the arrow is pointing at the:	Fulcrum	5
			Load position	
			Effort position	


14.		This is a:	Toggle switch	
			Slide switch	
			Rocker switch	5


15.		In the pulley system shown the load force is:	10N	5
			20N	
			30N	

16.		This symbol is found on products that can be:	Burned	
			Recycled	5
			Land-filled	

17.	The development of a container is shown. Make a sketch of the container in 3D in the space provided.		3D sketch	5
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18.		This plastic has been formed using a:	Hot-wire strip heater	
			Polystyrene cutter	
			Vacuum former	5

19.		Silk is a:	Natural fabric	5
			Synthetic fabric	
			Natural and synthetic fabric	

20.		This is an MES bulb. MES stands for:	Miniature Electronic Socket	
			Miniature Edison Screw	5
			Miniature Energy Source	

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

40 Marks

1.

(a) A motorised pulley-driven toy car made from wood is shown.

10 Marks

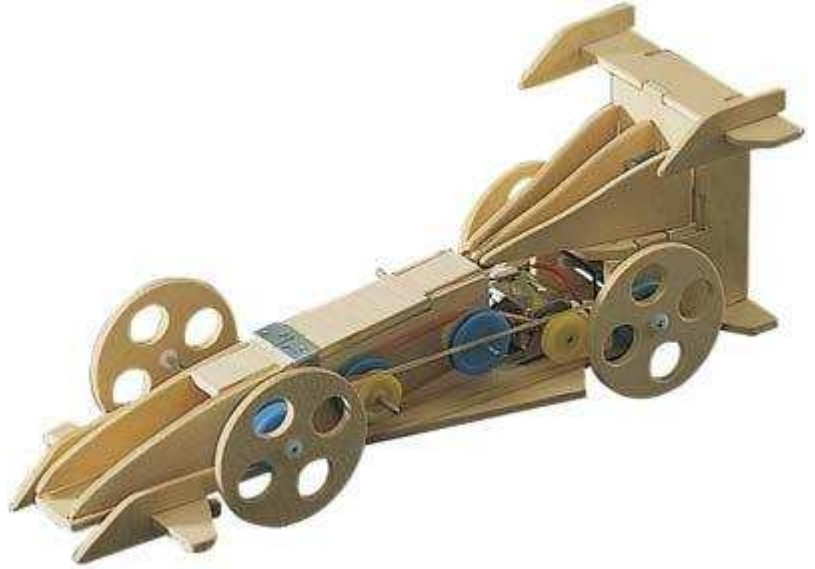
(i) Name a suitable wood to make the car.

2 Wood: _____

(ii) Name **two** other mechanisms that could be used to drive the vehicle.

2 1. _____

2 2. _____



Motorised Toy Car

(iii) When in use it was found that the wheels did not grip well. Describe how you would solve this problem.

4 _____

(b) (i) An outline drawing of one of the wheels used in the toy car is shown below. On this drawing locate accurately the centre of each of the four holes.

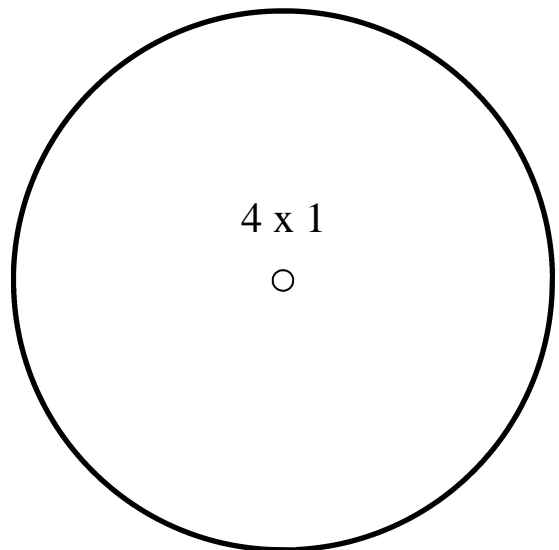
10 Marks

(ii) Describe **three** steps in the process required to make the holes.

2 1. _____

2 2. _____

2 3. _____



Wheel outline

(c) (i) A pictorial view of the components needed to drive the toy car is shown. In the space provided draw the circuit diagram for this system.

6

Circuit Diagram

6 x 1



3

(ii) Explain the term "Voltage".



3

(iii) When the **four** 1.5 volt batteries are placed in the holder what will the total voltage of the batteries be?

Battery holder

Total Voltage = _____

(d) In the space below make a sketch of a design solution for the following brief.

Design a working model of a solar-powered vehicle capable of travelling on rough ground.

8

Pencil sketch only

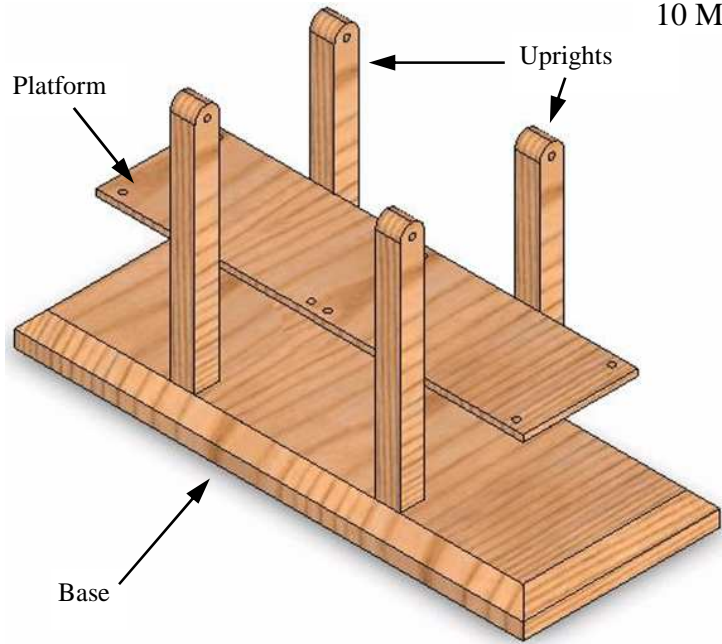
No Attempt 0	←	⑧
	→	1
Fair 2	←	3
	→	5
Good 4	←	6
Complete 6	←	
Quality of sketch = 2		

2.

40 Marks

(a) The uprights, platform and base of a model bridge structure are shown. Cables are to be attached to the bridge to make it stronger.

10 Marks



- 2 (i) Using a pencil, sketch the cables needed to strengthen the bridge.
- (ii) Other than wood, suggest a material suitable for the platform. Give a reason for your choice.

2 Material: _____

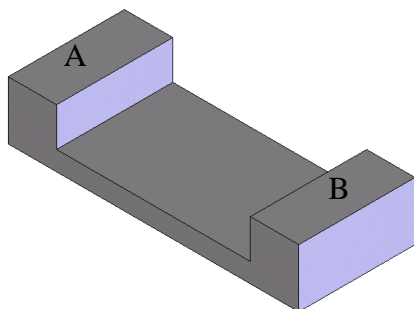
2 Reason: _____

4 (iii) Explain, using sketches, how the uprights could be attached to the base of the model.

(b) A lightweight frame bridge is to be constructed to span from A to B. Sketch your design for this bridge.

8

8 Marks



A

8

No Attempt 0 ←

→ 1

Fair 2 ←

→ 3

Good 4 ←

→ 5

Complete 6 ←

Quality of sketch = 2

B

(c) Two lamp posts are to be used to light up the bridge.

8 Marks

(i) Suggest a suitable material for the lamp post.

1 Material : _____

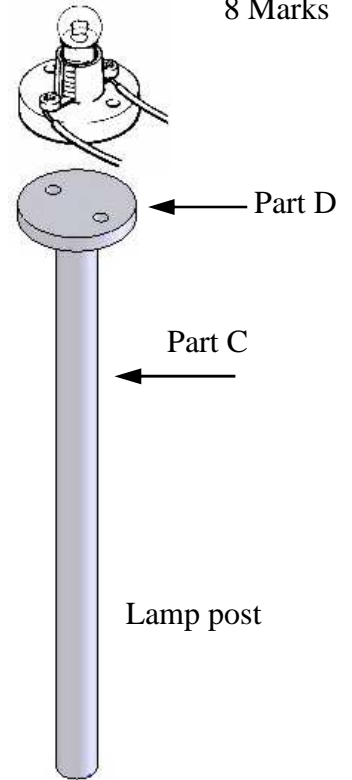
(ii) Parts C and D must be fixed together using a suitable joining method. Suggest a method and describe **three** steps in carrying out this process.

1 Method: _____

2 Step 1. _____

2 Step 2. _____

2 Step 3. _____

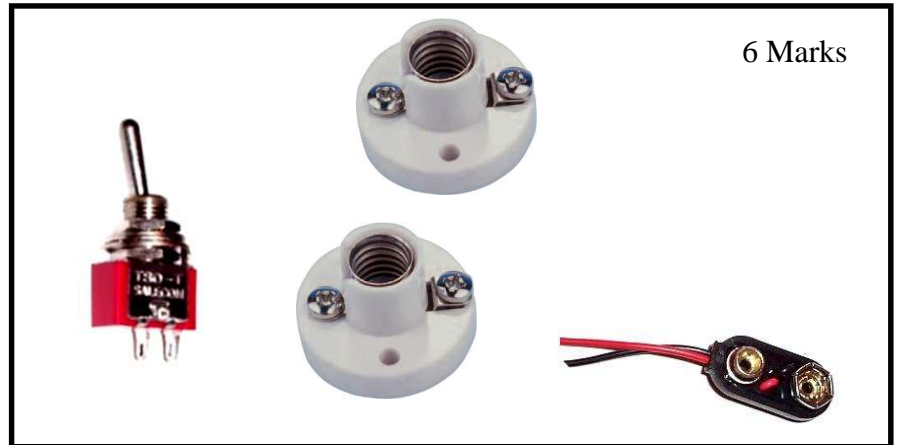


(d) The two bulb holders, the switch and battery snap are to be connected so that the bulbs are wired in parallel.

6 Marks

Show the wiring arrangement necessary for this circuit.

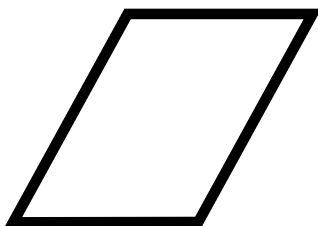
6 Parallel Wires $2 \times 2 = 4$
Switch Placement = 2



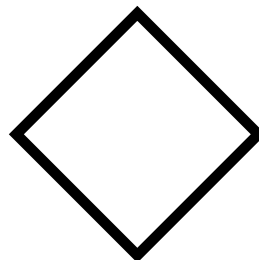
(e) Draw in the least number of bars to make each framework rigid.

8 Marks

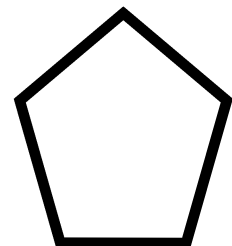
8 1st 2 correct: 2×3 , 3rd = 2



Framework 1



Framework 2



Framework 3

3.

40 Marks

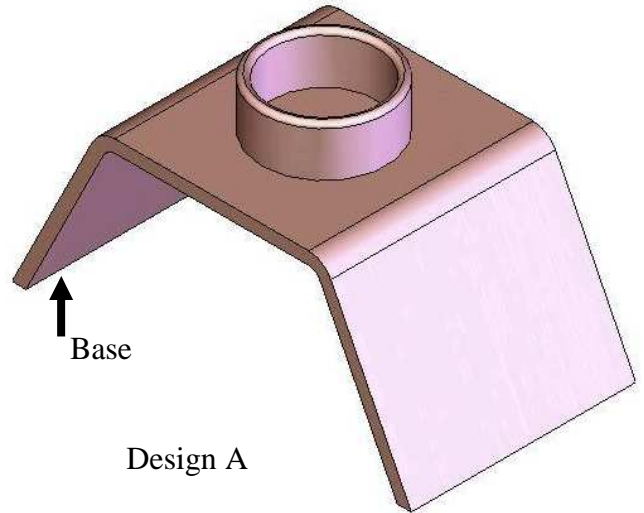
12 Marks

(a) The drawing shows a design for a night-light holder made from copper sheeting and tubing.

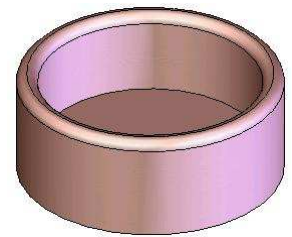
(i) Give **two** reasons why copper is a good choice of material for this task.

2 Reason 1. _____

2 Reason 2. _____



Design A



4 (ii) Describe how you would bend the base into the required shape.

(iii) List **two** safety precautions you should take when working with sheet copper.

2 1. _____

2 2. _____

(b) Draw a neat well-proportioned elevation of the complete night-light holder.

8 Marks

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

(c) An alternative design for a night-light holder is shown. The holder is made from two interlocking pieces of flat material.

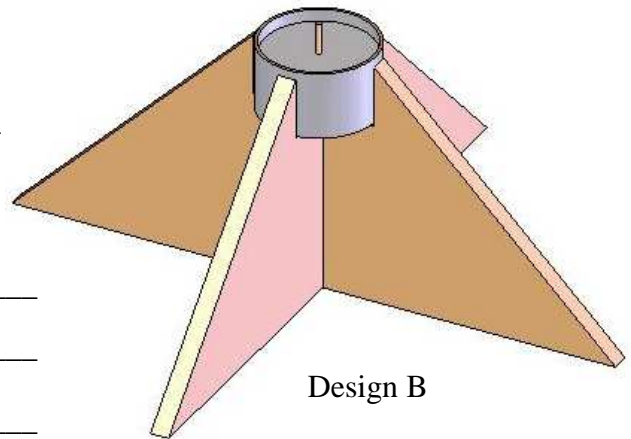
(i) Other than copper, suggest a suitable material for this design.

2 Suitable material: _____

(ii) Describe **two** steps necessary to get a smooth finish on the edge of this material.

2 Step 1. _____

2 Step 2. _____



(iii) Of the **two** night-light holders, Design A and Design B, state which one you prefer and give **two** reasons for your choice.

Selected design: _____

2 Reason 1. _____

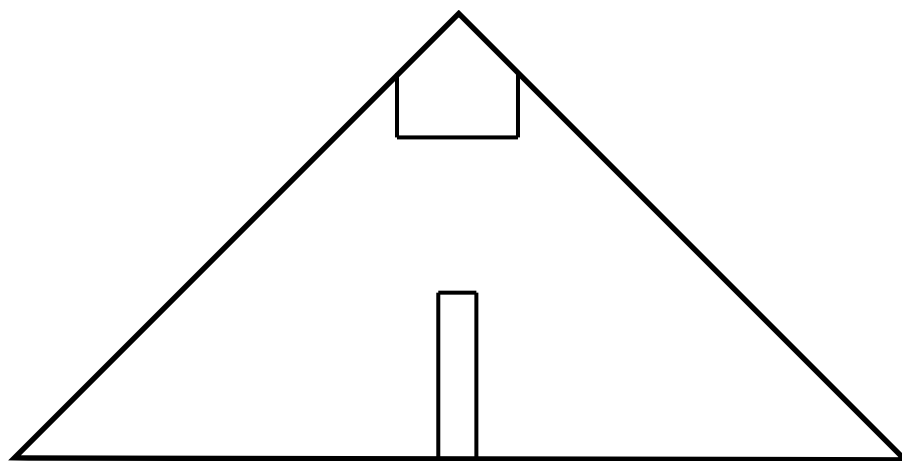
2 Reason 2. _____

(iv) When evaluating this design list **four** things that you would check.

4 x 1 1. _____ 2. _____

3. _____ 4. _____

(d) This drawing shows one of the sides used in Design B. Sketch the outline of the material that needs to be removed.



4.

40 Marks

(a) (i) Identify **two** mechanisms in this bicycle.

16 Marks

3 1. _____

3 2. _____

(ii) Describe **two** ways in which this bicycle is different from a traditional bicycle design.

2 1. _____

2 2. _____

2 (iii) What is a tension force?

(iv) Identify **two** parts of this bicycle that are in tension.

2 x 2 1. _____ 2. _____



(b) (i) Identify the mechanisms A and B.

16 Marks

3 A. _____

3 B. _____



Mechanism A



Mechanism B

(ii) Identify **one** use for each of these mechanisms.

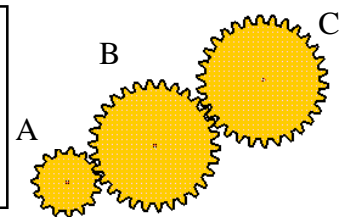
3 A. _____

3 B. _____

(iii) In the gear train shown, gear A has 15 teeth, gear B has 30 teeth and gear C has 30 teeth. Calculate the rotary speed of gear C if the driver gear A is rotating at 80 RPM.

4

Calculation



(c) The inventor of the zip fastener, Whitcomb L. Judson, is shown opposite.

8 Marks

2 (i) State **one** advantage of a zip fastener: _____

(ii) Name **three** other inventors and their inventions.

2 x 1 1. _____ Invention: _____

2 x 1 2. _____ Invention: _____

2 x 1 3. _____ Invention: _____

