Coimisiún na Scrúduithe Stáit
State Examinations Commission

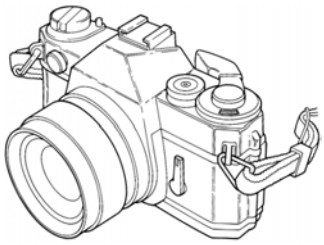
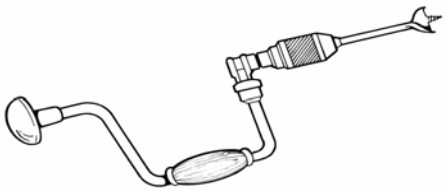
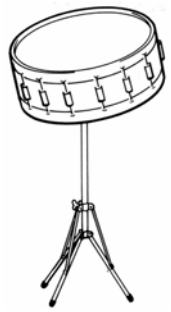
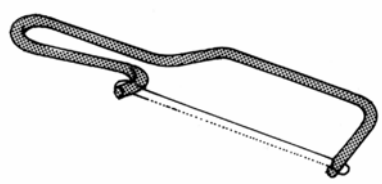
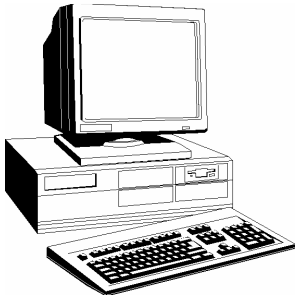
Junior Certificate Examinations, 2003

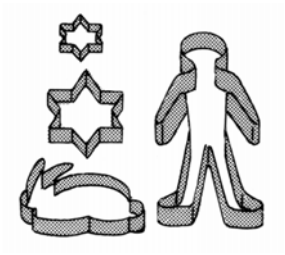
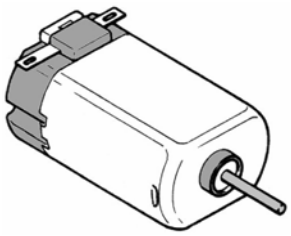
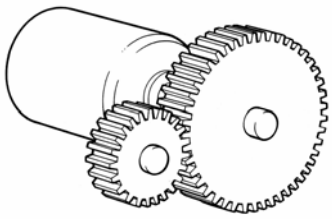
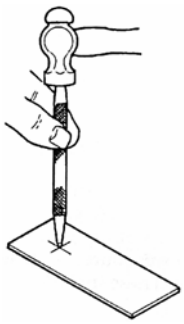
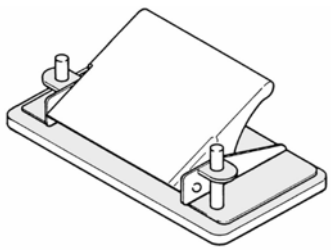
TECHNOLOGY

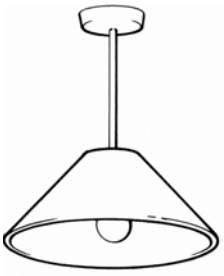
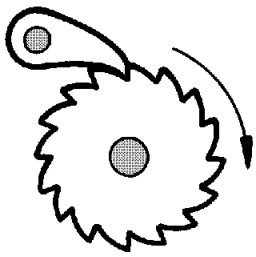
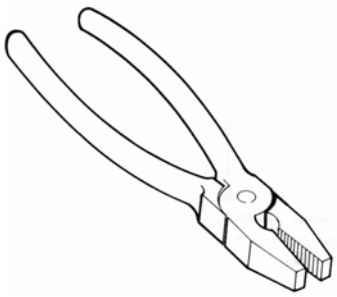
ORDINARY LEVEL

Marking Scheme

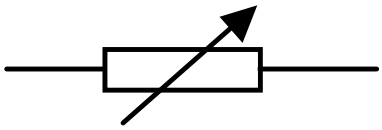
SECTION A – 80 MARKS ANSWER ANY <u>SIXTEEN</u> QUESTIONS FROM THIS SECTION

1. 	This camera is shown in:	Elevation	
		Isometric	⑤
		Plan	
2. 	This bit and brace is used to bore a hole in:	Steel	
		Glass	
		Wood	⑤
3. 	The drum skin is in:	Compression	
		Tension	⑤
		Torsion	
4. 	This is a:	Coping Saw	
		Junior Hacksaw	⑤
		Piercing Saw	
5. 	Which of these programs would you use to write a letter?	Spreadsheet	
		Database	
		Word Processor	⑤

6. 	Pastry cutters are generally made from:	Iron	
		Wood	
		Stainless Steel	(5)
7. 	This is a:	Capacitor	
		Motor	(5)
		Transistor	
8. 	This mechanism is a:	Rack and Pinion	
		Cam and Follower	
		Gear Train	(5)
9. 	This tool is a:	Centre Punch	(5)
		Chisel	
		Scriber	
10. 	When using this paper punch the effort is:	Equal to the load	
		Bigger than the load	
		Smaller than the load	(5)

11. 	Natural fabrics are often used to cover seats. Which of these is a natural fabric?	Nylon	
		Leather	⑤
		Polyester	
12. 	Electrical power is measured in:	Watts	⑤
		Amps	
		Volts	
13. 	Hurleys are made from:	Pine	
		Oak	
		Ash	⑤
14. 	This mechanism is a:	Rack and Pinion	
		Cam and Follower	
		Ratchet and Pawl	⑤
15. 	This tool is a:	Vice Grips	
		Pliers	⑤
		Snips	

16.

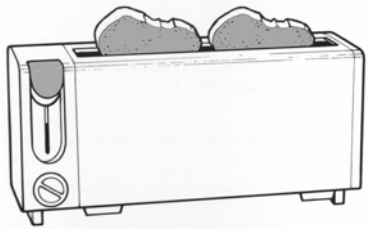


Name the component represented by this symbol.

Name: Variable Resistor

⑤

17.

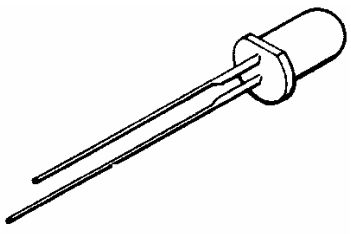


An electric toaster converts electrical energy into what other form of energy?

Answer: Heat Energy

⑤

18.

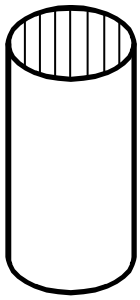


Name the electronic component shown.

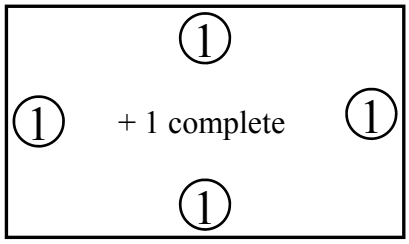
Name: LED or Light Emitting Diode

⑤

19.

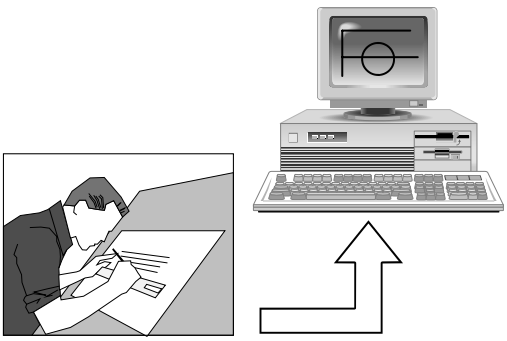


Draw a development of an open cylinder.



⑤

20.



What do the letters CAD stand for?

Answer: Computer Aided Design,
Computer Assisted Design,
Computer Aided Drawing, etc.

⑤

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

1. **40 Marks**

10 Marks

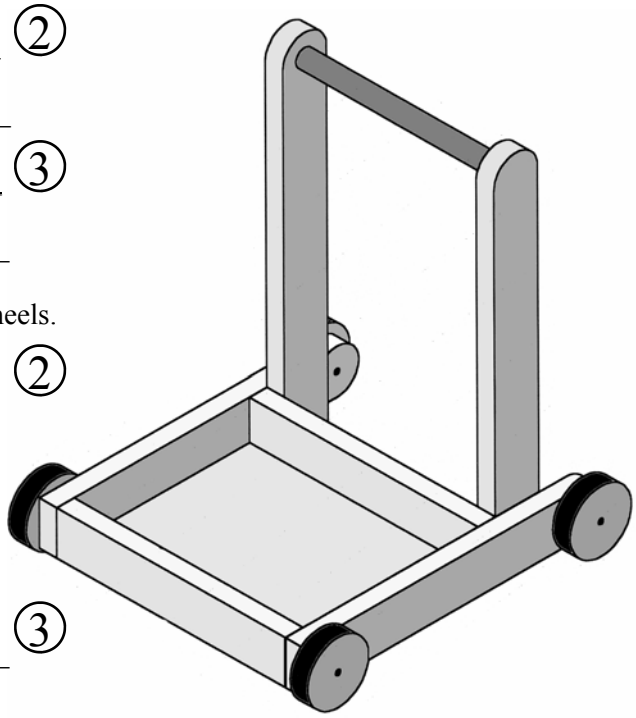
(a) A toddler's truck designed by Technology students is shown. The frame and wheels of the truck are made from **different** materials.

(i) Name the material you would use to make the frame of the truck and give a reason for your choice.

Material: *Pine* ②

Reason for choosing: ③

Attractive finish, cheap, easy to work with, etc.



(ii) Name a material that you would use to make the wheels.

Material: *Nylon* ②

(iii) Briefly explain how you would connect the wheels to the frame.

Secure with pins or screws, axle. ③

10 Marks

(b) (i) List three things that the Technology students had to consider when designing this truck.

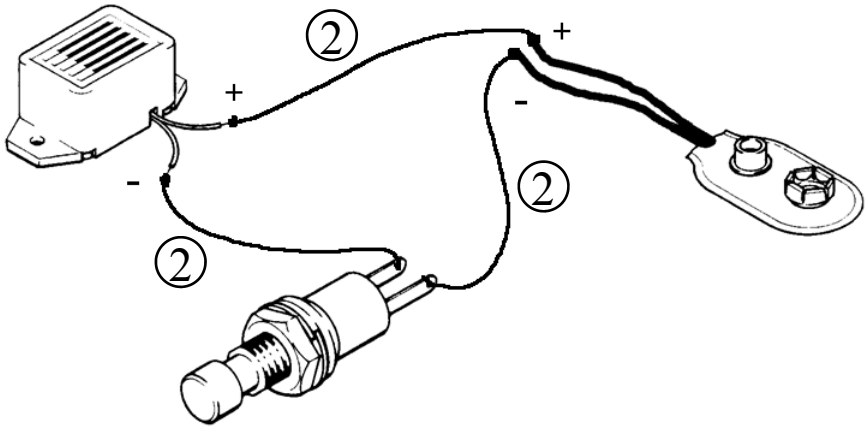
1. *Height, cost, load to carry.* ②
2. *Width, coloure, finish, weight, stability.* ①
3. *Safety issues, will it appeal to toddlers?* ①

(ii) List three processes you would use to make this truck and name one tool or machine used in each process.

Process	Tool or Machine	
Marking out	*Square*	②
Cutting	*Tenon Saw*	②
Drilling	*Lathe*	②

10 Marks

(c) (i) An electronic circuit is to be included in the design which allows a toddler to switch on a buzzer. The components for the circuit are given below. Draw in the wires needed to complete the circuit.

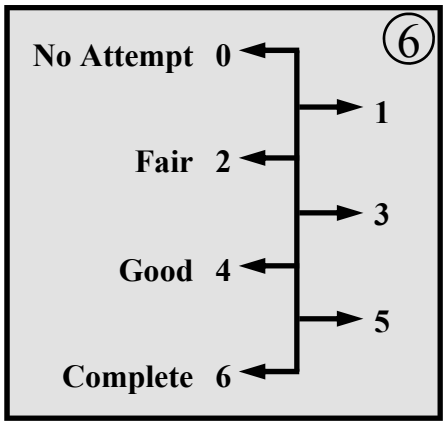


(ii) Briefly explain how the push to make switch works. ④

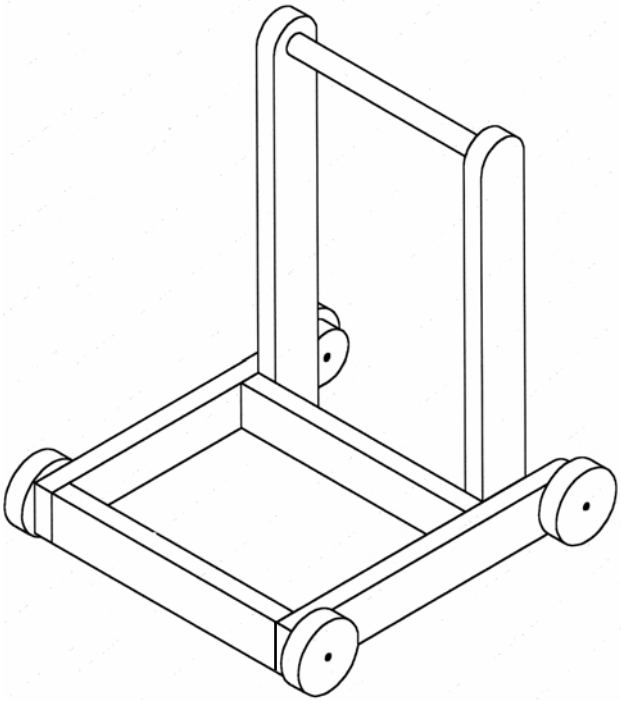
When the button on the push to make switch is pressed the switch contacts will close, current will flow and the buzzer will emit a sound.

6 Marks

(d) Show how you would safely attach the electronic circuit to the truck.



Must show box or circuit neatly attached and not interfering with truck use.



4 Marks

(e) List two tests that you would carry out when evaluating this design.

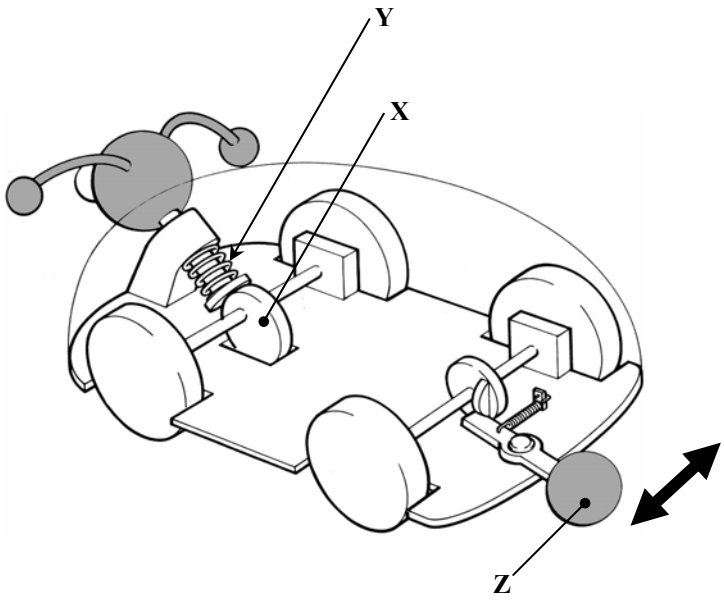
Test 1: *Test for safety and or stability.* ②

Test 2: *Test operation of buzzer, wheels etc.* ②

2. **40 Marks**

10 Marks

(a) A mechanical toy is shown.



(i) Name the mechanism 'X'.

Name: *Cam* ②

(ii) What is the purpose of the spring 'Y'?

Answer: ②

To keep follower in contact with the cam

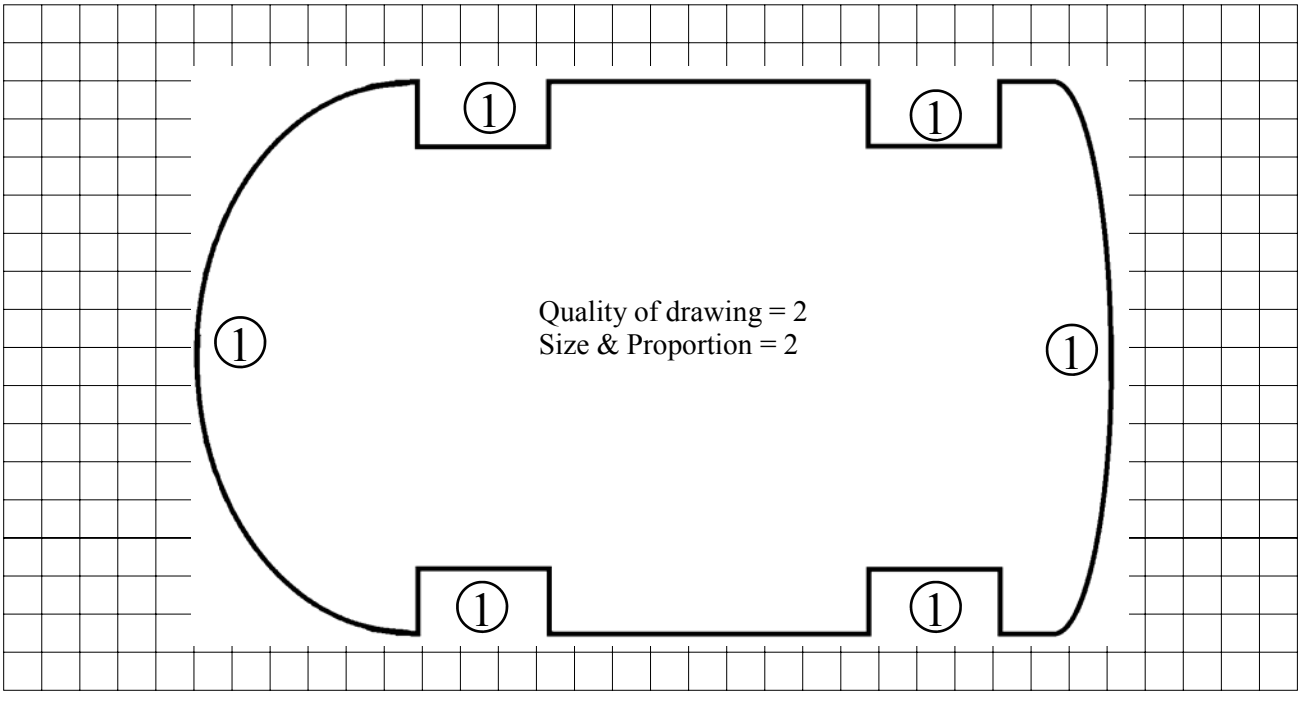
(iii) Indicate on the drawing the direction in which the tail 'Z' moves as the rear wheels rotate. ②

(iv) Name a material that you would use to make the base of the toy and give a reason for your choice.

Material: *Plywood.* ②

Reason: *Light and cheap* ②

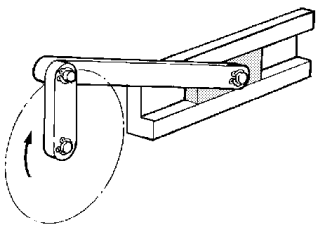
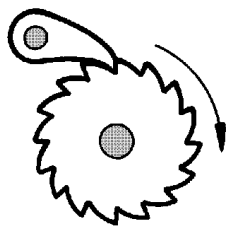
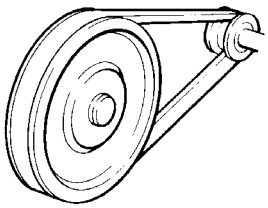
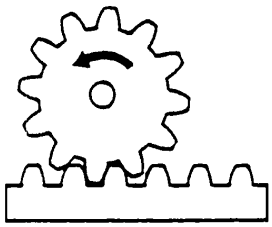
(b) Draw the outline of the base of this toy on the grid below. **10 Marks**



8 Marks

(c) (i) Complete the chart by naming any **three** of these mechanisms.

NOTE: 3 x 2 marks only.

②  Name: *Crank & Slider*	②  Name: *Ratchet & Pawl*
②  Name: *Pulley*	②  Name: *Rack & Pinion*

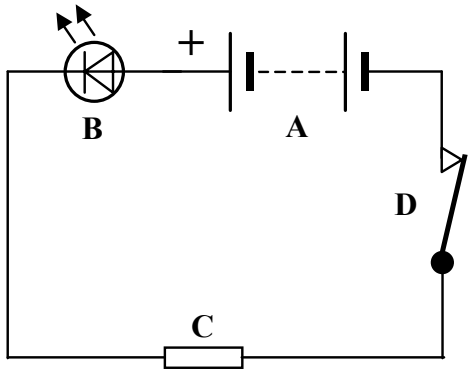
(ii) Select one mechanism from the chart and give an example of where it is used.

Mechanism: *Pulley*

Use: *Fan in a car engine.* ②

8 Marks

(d) Name the components 'A', 'B', 'C' and 'D'.



Component	Name
A	*Battery* ②
B	*LED* ②
C	*Resistor* ②
D	*Switch* ②

4 Marks

(e) Designers have to be very careful when designing toys for young children.
List two precautions which must be taken when designing such toys.

1. *No loose parts or sharp edges.* ②

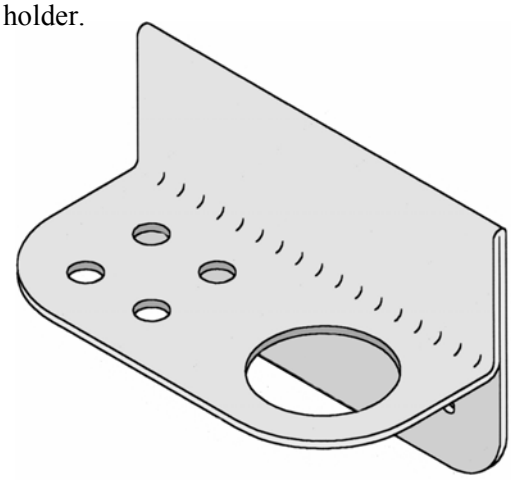
2. *Strong & durable. No small parts.* ②

3. **40 Marks**

10 Marks

(a) A design for a wall mounted toothbrush and glass holder is shown.

(i) Give three reasons why acrylic is a suitable material for this holder.



1. *Attractive material, available in many colours.* (2)

2. *Easily cleaned, hygienic.* (2)

3. *Easy to bend and form to shape.* (2)

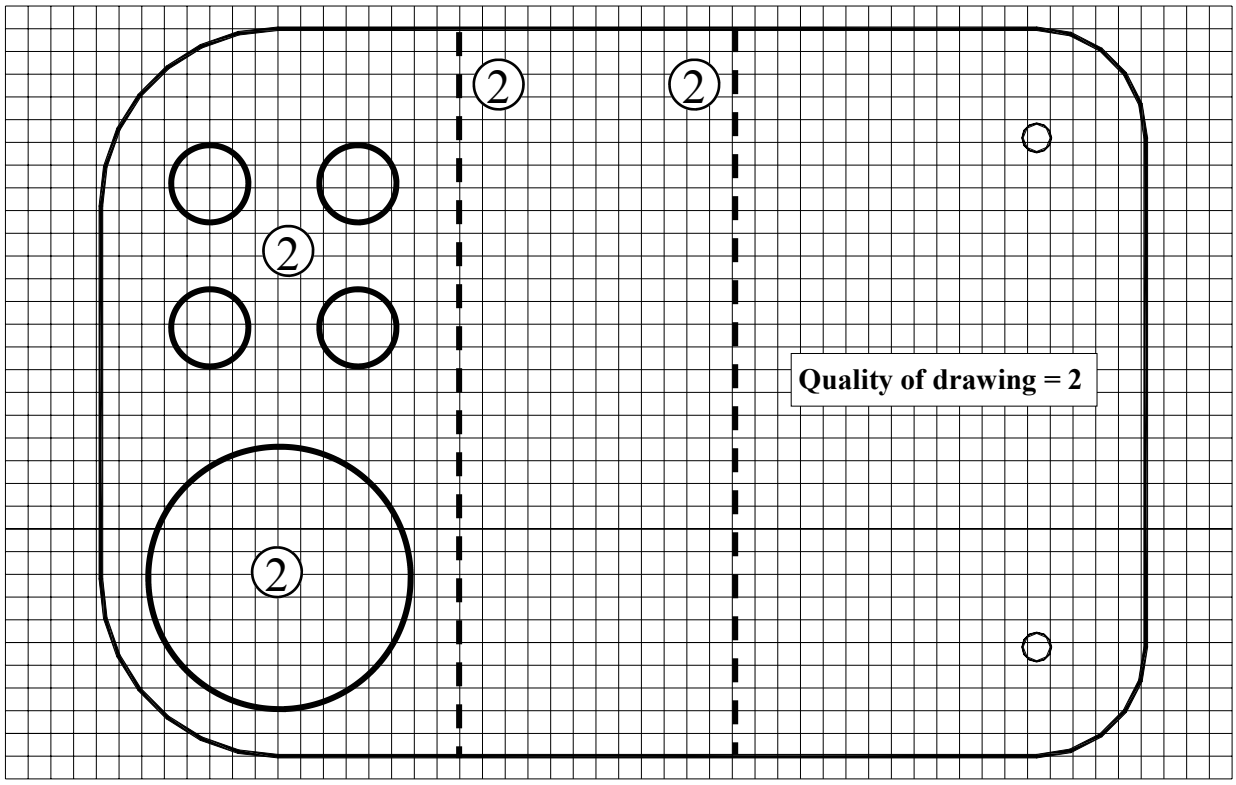
(ii) Give two precautions that should be taken to prevent the acrylic from cracking while drilling.

1. *Use correct drill bit, correct drill speed,* (2)

2. *Hold work firmly while drilling, support with wood.* (2)

10 Marks

(b) Complete the development of the holder showing all holes and bend lines.



8 Marks

(c) (i) Briefly describe how the hole for the glass is made in the holder.

Drill hole and use a scroll saw, use a hole saw. ④

(ii) List two processes that you would use to produce a good finish on the edges of the holder.

1. *First file to shape.* ②

2. *Then finish with fine sandpaper or steel wool, polish, oil.* ②

8 Marks

(d) Draw an isometric sketch of a design for a wall mounted soap dish holder.
The soap dish holder is to be made from acrylic sheet.

⑧

No Attempt 0
1
Fair 2
3
Good 4
5
Complete 6

Quality of sketch = 2

4 Marks

(e) Pan head screws are used to fix the holders to the wall.
Why are countersunk screws unsuitable for this purpose?

Countersunk screw head would crack plastic.

Pan head screw

Countersunk screw

4. **40 Marks**

12 Marks

(a) (i) Briefly describe the contribution made to technology by one of the following:
Alexander Graham Bell, Charles Babbage, John Logie Baird, Archimedes, Guglielmo Marconi.

Name: _____

Contribution: *Bell (Telephone), Babbage(Calculator/Computer), Baird (Television), Archimedes (Screw pump), Marconi (Radio transmitter)* (2)

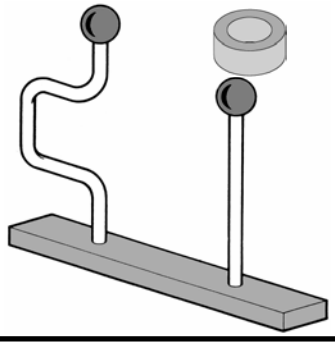
(ii) List three recent developments in modern technology.
1. *DVD technology* (2)
2. *Mobile communication* (1)
3. *Re-writable CDs* (1)

(iii) State the difference between renewable and non-renewable energy. Give an example of each type.
Non-renewable energy cannot be used again (2)

Renewable: *Solar, wind, water* (2) Non-renewable: *Nuclear, oil, peat* (2)

10 Marks

(b) A training aid to help children develop their grip, hand and arm movements is shown. The children have to thread coloured discs onto the rods.



(i) Give a suitable material for the base, the rods and the discs.

Base: *Pine* (2) Rods: *Steel* (2)

Discs: *Nylon* (2)

(ii) The aid was found to be unstable. How would you solve this problem?
Increase the size of the base (4)

12 Marks

(c) (i) Give two ways in which technology helps us to be fit and healthy.

1. *Exercise bike, threadmill.* (2) 2. *Modern medicine.* (2)

Give two ways in which technology may prevent us from getting fit.

1. *Watching too much television.* (2) 2. *Playing game consoles too often.* (2)

(ii) Technology plays an important role in our hospitals. Briefly describe two ways in which technology can help save lives.

1. *Incubator* (2)
2. *Heart monitor* (2)

6 Marks

(d) Give three examples of how the entertainment industry has benefited from advances in technology.

1. *Internet music* (2)
2. *Special effects* (2)
3. *Consoles games, Flat screen TVs, satellite broadcasting.* (2)