Coimisiún na Scrúduithe Stáit
State Examinations Commission

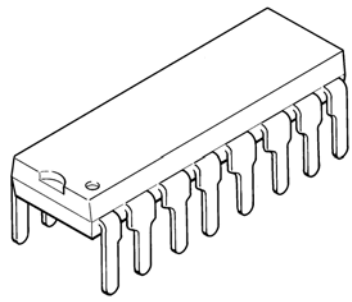
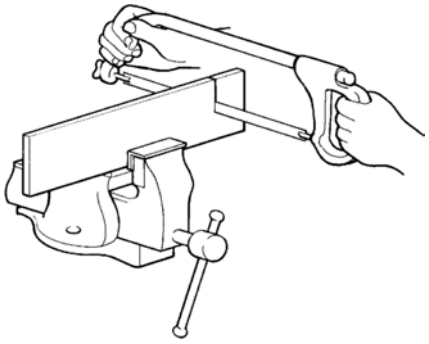
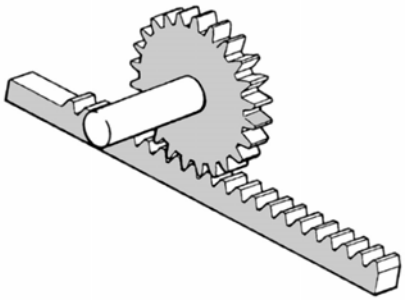
Junior Certificate Examinations, 2005

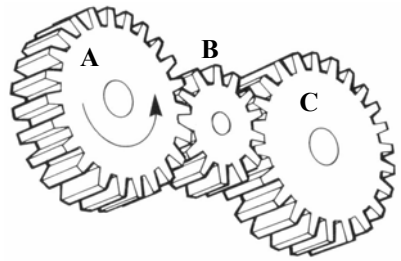
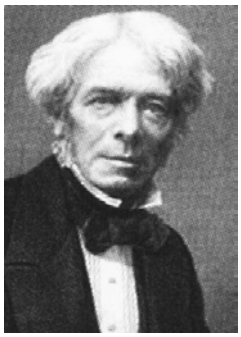
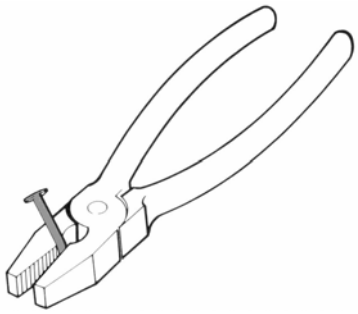
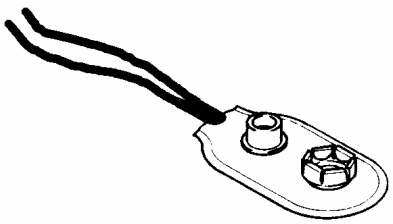
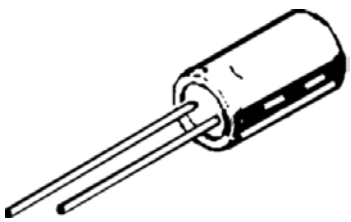
TECHNOLOGY

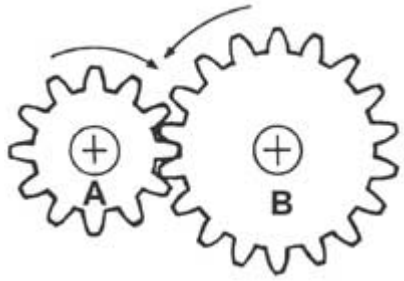
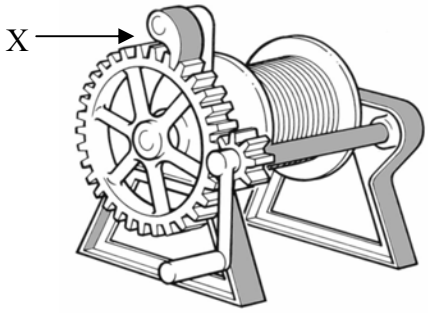
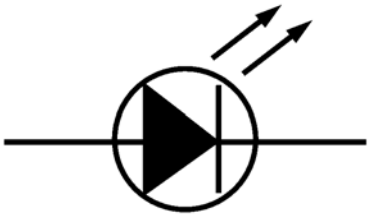
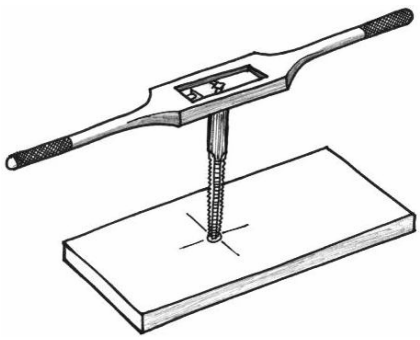
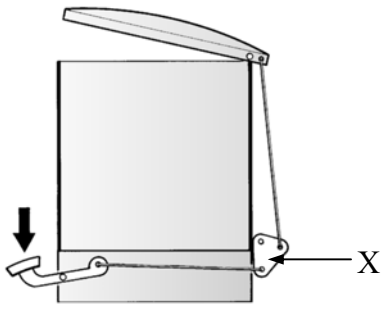
ORDINARY LEVEL

Marking Scheme

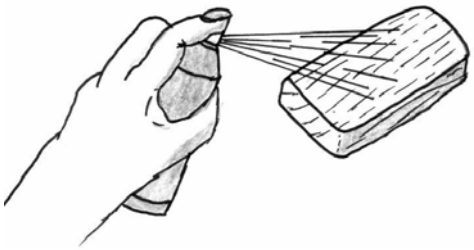
SECTION A – 80 MARKS **ANSWER ANY <u>SIXTEEN</u> QUESTIONS IN THIS SECTION**

1. 	The microchip is shown in:	Orthographic	
		Isometric	⑤
		Oblique	
2. 	The fabric surface of the umbrella is in:	Compression	
		Shear	
		Tension	⑤
3. 	Coal is a:	Renewable fuel	
		Fossil fuel	⑤
		Nuclear fuel	
4. 	This cutting tool is a:	Tenon saw	
		Hacksaw	⑤
		Junior hacksaw	
5. 	This mechanism is a:	Rack and pinion	⑤
		Gear train	
		Pulley drive	

6. 	The idler gear is labelled:	A	
		B	⑤
		C	
7. 	Michael Faraday built the first:	Car	
		Motorcycle	
		Electric motor	⑤
8. 	The nail in the jaws of the pliers is:	The effort	
		The load	⑤
		The fulcrum	
9. 	This component is a:	Water level sensor	
		Battery tester	
		Battery snap	⑤
10. 	This electronic component is:	Capacitor	⑤
		Diode	
		Thermistor	

11.  A=12 Teeth, B=18 Teeth	If B rotates at 100 RPM, A rotates at:	100 RPM	
		150 RPM	⑤
		200 RPM	
12. 	Mechanism X is a:	Sprocket	
		Slider	
		Pawl	⑤
13. 	This electronic symbol represents a:	Light Emitting Diode	⑤
		Light Dependent Resistor	
		Battery	
14. 	This cutting tool is a:	Drill	
		Die	
		Tap	⑤
15. 	Part 'X' is a:	Caliper	
		Bell Crank	⑤
		Parallel Linkage	

16.

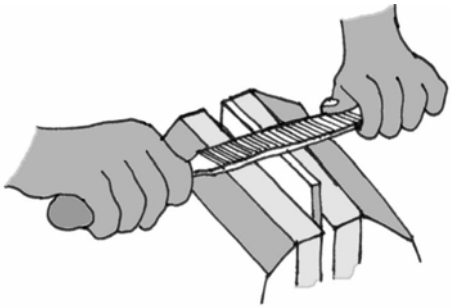


What safety precautions should be taken when using aerosol spray paints?

1. *Good ventilation*

2. *Don't spray near flames*

17.

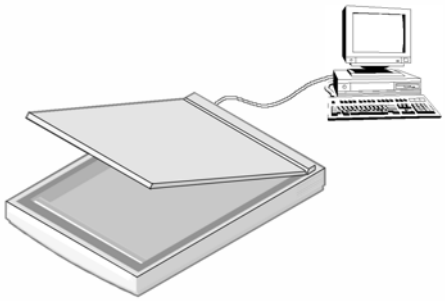


Name **two** materials that can be filed to improve their finish.

1. *Perspex*

2. *Aluminium*

18



Name this computer input device and state **one** of its uses.

Name: *Scanner*

Use: *Scan pictures*

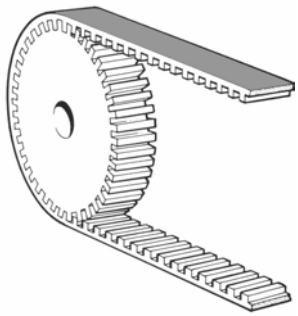
19.

Describe **one** advantage of using Computer Aided Drawing (CAD) to produce a drawing of a house as shown.

Drawings can be edited easily.

Can zoom in on deatail.

20.



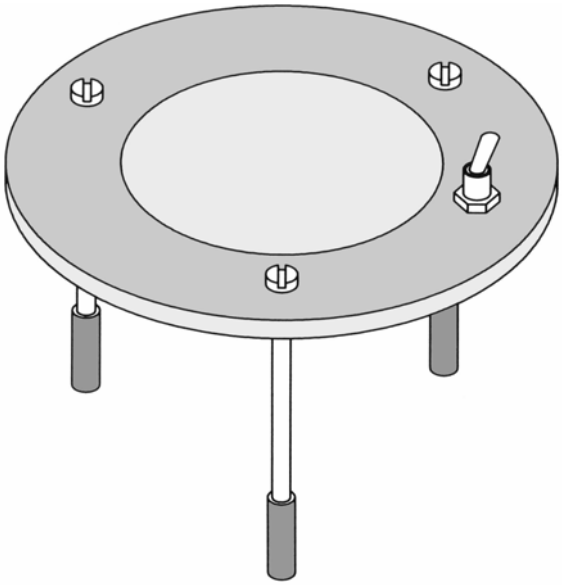
State **one** reason for using a toothed belt.

The belt cannot slip.

SECTION B – 80 MARKS
ANSWER ANY <u>TWO</u> QUESTIONS FROM THIS SECTION

1. 40 Marks

(a) 14 Marks



Off-centre cam attached to motor shaft.

(b) 6 Marks

(c) A battery consisting of 4 AA cells is used to power the Jitterbug. 8 Marks

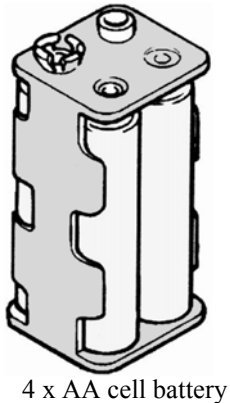
(i) What is the voltage of one AA cell? *1.5v* ①

(ii) What is the battery voltage when the cells are connected in series? *6v* ②

(iii) Name another method used to connect cells. *Parallel* ②

(iv) What is the unit of current? *Amp* ②

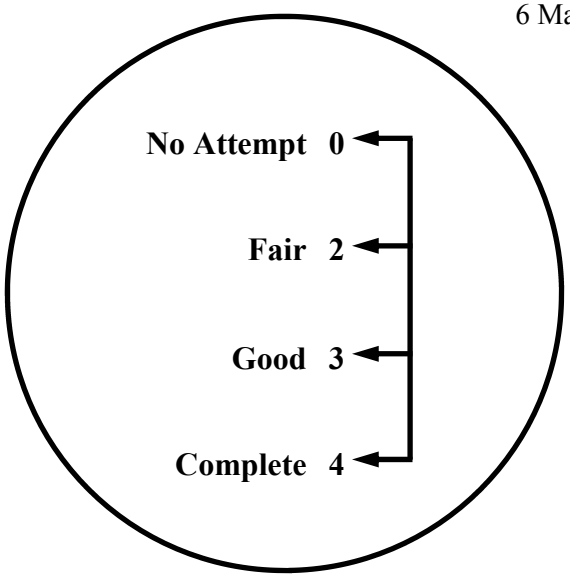
(v) What instrument is used to measure current? *Multimeter* ①



4 x AA cell battery holder

(d) A logo is to be attached to the Jitterbug. 6 Marks

(i) In the circle shown draw a logo suitable for this toy.



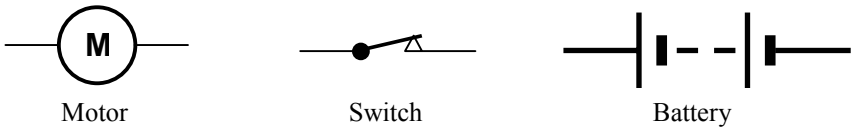
(ii) What is the purpose of a logo?

Used to identify toy. ②

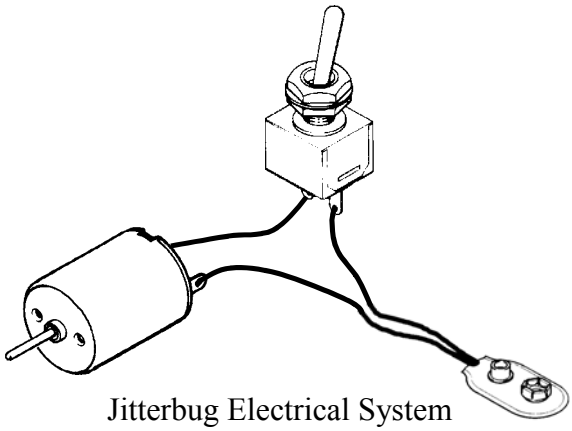
Used for marketing.

Adds to the overall finish.

(e) Draw a circuit diagram of the electrical system for the Jitterbug. 6 Marks

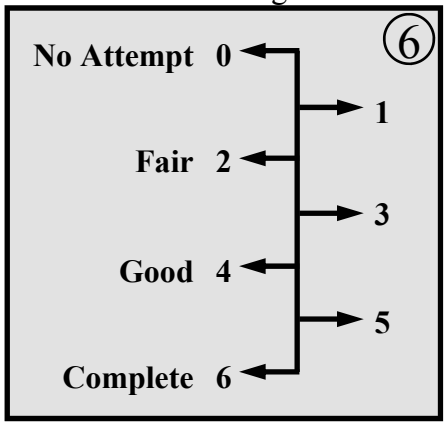


Motor Switch Battery



Jitterbug Electrical System

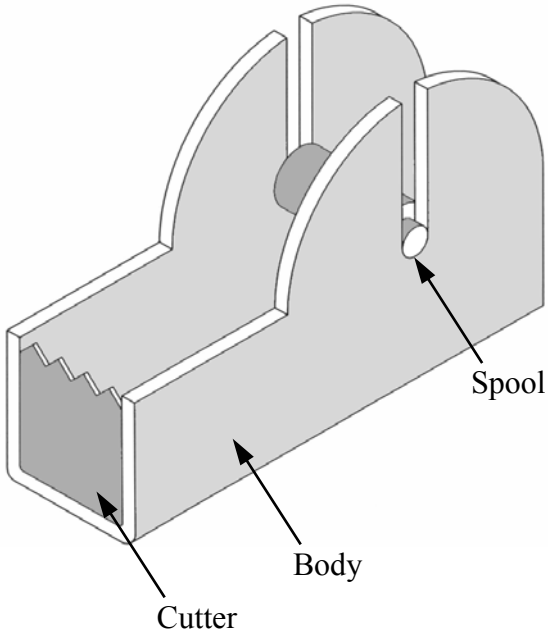
Circuit Diagram ⑥



2.

40 Marks

(a) A drawing of a tape dispenser is shown. 10 Marks



(i) Name **two** sheet materials that could be used to make the body of the dispenser.

1. *Perspex* ①

2. *Aluminium* ①

(ii) Select **one** of these materials and list **three** processes used in the manufacture of the body before bending to shape.

Material: *Perspex*

Process 1: *Cutting/Drilling* ②

Process 2: *Filing/Polishing* ②

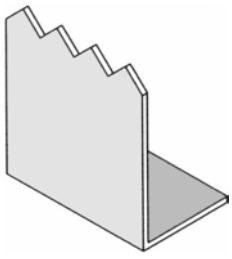
Process 3: *Bending* ②

(iii) Describe how the body of the dispenser can be bent to shape.

Use strip bender to heat body along the bend lines and bend at 90°, ②

check angles for accuracy after bending.

(b) A drawing of the cutter for the tape dispenser is shown. 10 Marks


Cutter

(i) Name **two** suitable methods of joining the cutter to the body of the tape dispenser.

1. *Glue* ②

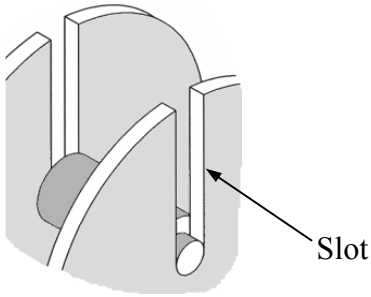
2. *Screw* ②

(ii) Describe how the slot in the tape dispenser is formed.

Drill holes on development and cut inside slot edges

until hole is reached, finish edges by filing and polishing.

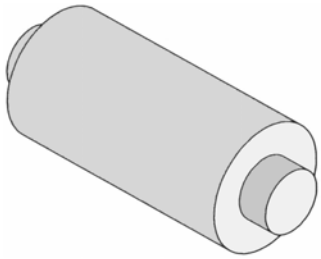
⑥



6 Marks

(c) (i) Name a suitable material to make the spool and name a machine used to shape it.

Material: *Steel* ② Machine: *Lathe* ②



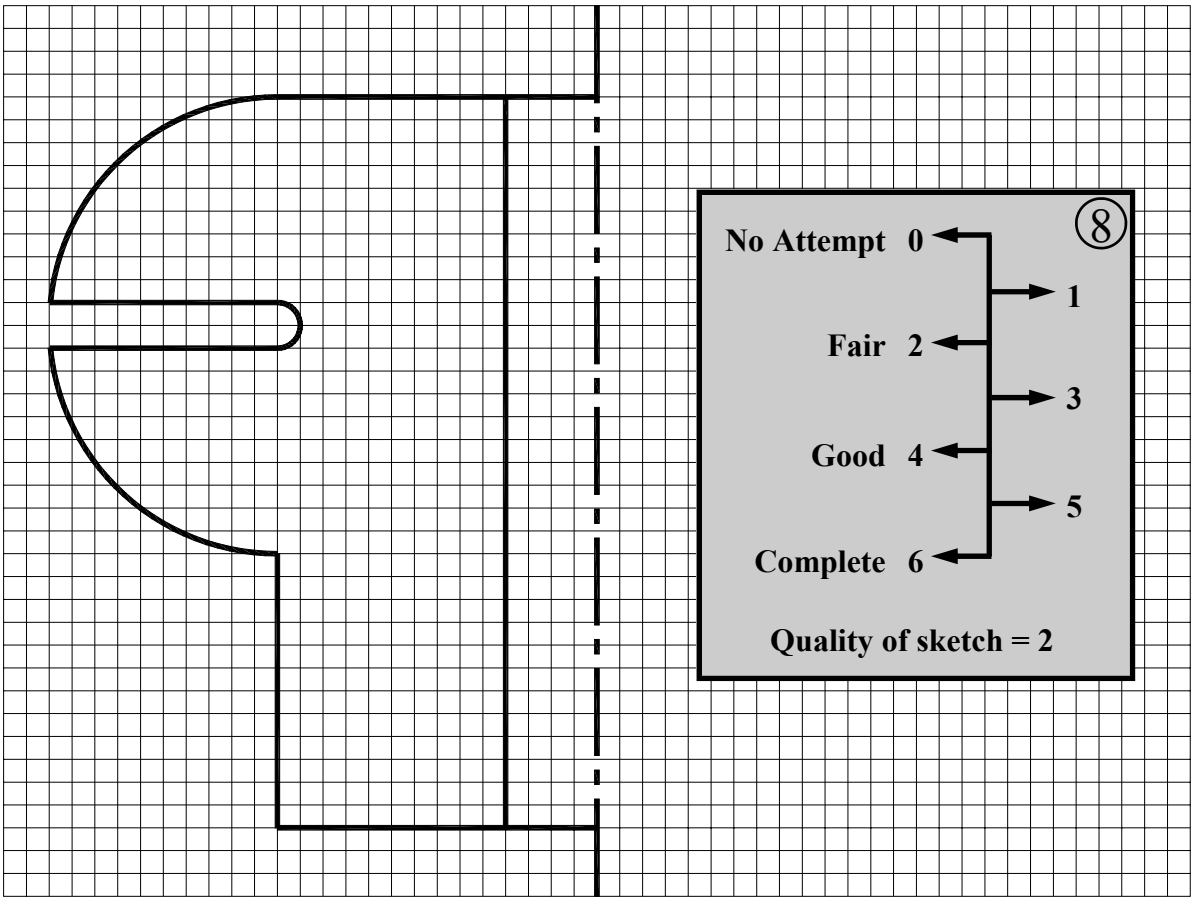
Spool

(ii) Why is the diameter of the spool reduced at both ends?

To stop the spool from falling out. ②

8 Marks

(d) A development of half the body of the dispenser is shown below. Complete this development.



6 Marks

(e) You are required to test the dispenser after manufacture.
Describe **three** tests that you would carry out.

1. *Place roll of tape into dispenser and check operation.* ②
2. *Test the cutter, does it cut the tape?* ②
3. *Test to see if the dispenser slips.* ②

3. 40 Marks

(a) Students in a Technology class were asked to design a bookrest for a desk. 12 Marks

(i) List **three** sources of information that could be used when researching this brief.

1. *WWW* ②
2. *Library* ②
3. *Woodwork magazines* ②

(ii) List **three** further stages in the design process.

1. *Manufacturing* ②
2. *Testing* ②
3. *Evaluation* ②

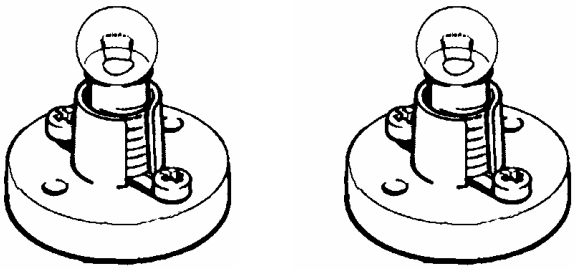
8 Marks

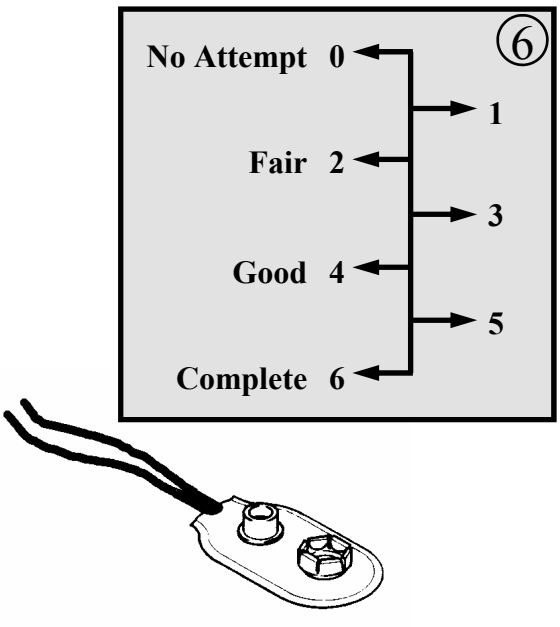
(b) One student decided to include **two** bulbs in her design so that people could see the book more clearly.

(i) Both bulbs were rated 300mA. What does **mA** represent?

milliAmp ②

(ii) The components used in the task are shown below. Complete the wiring so that the bulbs are connected in **parallel**.

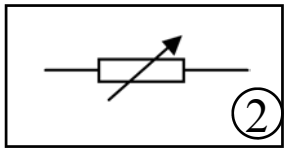


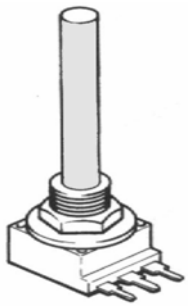


6 Marks

(c) (i) To vary the brightness of the bulbs the component shown in the sketch was added. Name this component and draw its symbol.

Name: *Variable Resistor* (2) Symbol: (2)





(ii) Suggest **one** other use for this component.

Volume control (2)

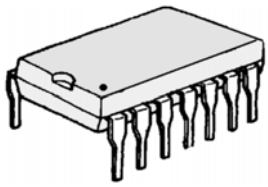
6 Marks

(d) (i) Microchips are used in many electrical products. Name **two** products that use microchips in their design.

1. *CD Player* (2)
2. *Computer* (2)

(ii) List **one** advantage of using microchips in electronic products.

Reduce the size of electronic products. (2)



Microchip

8 Marks

(e) A design for a book shelf is shown.

(i) Name **one** material suitable for the frame and a **one** other material suitable for the shelves.

Frame: *Steel* (1)

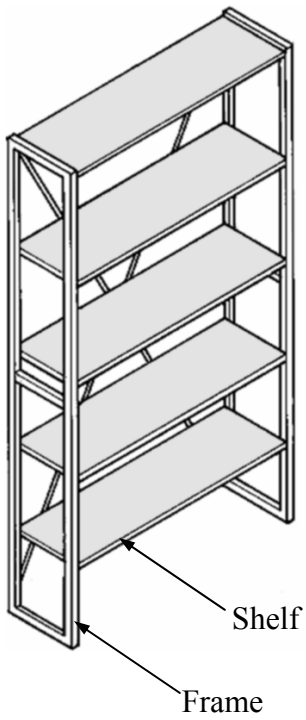
Shelf: *MDF* (1)

(ii) Why is the "**X**" shaped framework used at the back of the shelving unit?

To add rigidity to the framework. (2)

(iii) When books were placed on the shelving unit it was found that the shelves sagged in the middle. How would you prevent this from happening?

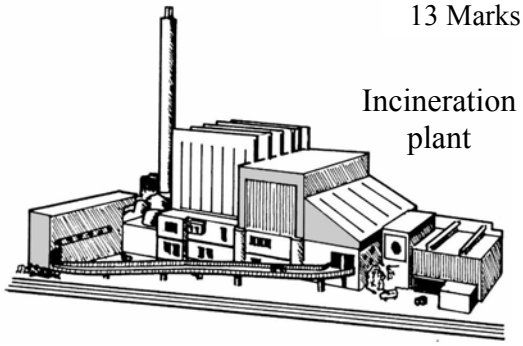
Use thicker MDF. (2)



(iv) Books are now available in CD format. What do the letters CD represent? *Compact Disc* (2)

4. 40 Marks

(a) (i) State **one** advantage and **one** disadvantage of using incinerators as a method of waste disposal. 13 Marks



Incineration plant

Advantage: Quick way to dispose of large amounts of waste. (4)

Disadvantage: Emissions may cause health problems. (4)

(ii) Suggest **one** other method of waste disposal. What are the advantages and disadvantages of this method?

Landfill. Advantages: Waste is buried easily. Disadvantage: Pollutes ground water. (5)

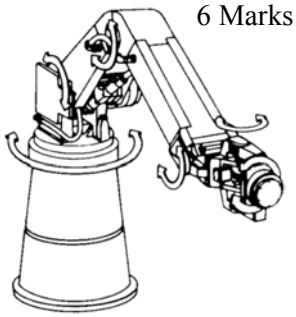
(b) Give **three** examples of how Satellite technology is used today. 9 Marks

1. *GPS* (3)
2. *TV* (3)
3. *Weather forecast* (3)

(c) Name **three** appliances that use electric motors. 6 Marks

1. *Electric Drill* (2) 2. *Electric lawnmower* (2) 3. *Washing machine* (2)

(d) List **three** reasons why robots are used in the manufacture cars. 6 Marks



1. *Faster than humans.* (2)
2. *Can be programmed to repeat tasks.* (2)
3. *Consistently accurate.* (2)

(e) List **three** ways in which Technology has improved our daily lives. 6 Marks

1. *Mobile phones* (2)
2. *Development of advanced drugs* (2)
3. *Safer cars* (2)