



**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**  
***Leaving Certificate Applied 2005***

**Vocational Specialism - Technology**  
**(240 Marks)**

**Wednesday, 15th June 2005**  
**Afternoon 2.00 pm to 4.00 pm**

***General Directions***

1. Write your examination number in this space:

2. There are two sections in this paper.

Section 1– Answer **all three** questions.

- 90 marks

**Q1. - Short answer questions**

**Q2. - Graphical Communication**

**Q3. - Health and safety**

Section 2– Five questions, answer **any three**

- 150 marks

**Q1. - Introducing Technology**

**Q2. - Design and Manufacture**

**Q3. - Water Technology**

**Q4. - Electrical Understanding and Basic Electronics**

**Q5. - Tools and Equipment**

3. Write your answers in the spaces provided and include sketches (in pencil) as appropriate.

**Centre Stamp**

*For the superintendent only*

Question 1

(40 marks)

1. Answer **any TEN** of the following **FIFTEEN** short questions

(a) A photograph of a kitchen sink is shown.  
Name the material from which the sink is made and give a reason why this material is used.

Material name: \_\_\_\_\_

Reason for using: \_\_\_\_\_

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



(b) A cordless electric jug kettle is shown. List two advantages of this type of kettle:

Advantage 1. \_\_\_\_\_

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

Advantage 2. \_\_\_\_\_

\_\_\_\_\_



(c) Suggest two ways in which buildings can be made more accessible for people in wheelchairs.

1. \_\_\_\_\_

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

2. \_\_\_\_\_

\_\_\_\_\_



(d) A PP3 battery is shown. What is the voltage of this battery and explain the term "Voltage".

Voltage value: \_\_\_\_\_

Explanation of the term "Voltage": \_\_\_\_\_

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

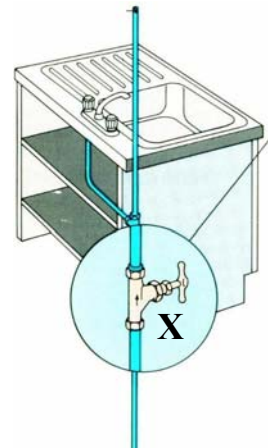


(e) Identify component "X" in the illustration and name one other place in the plumbing system of a house where it could be used.

Component name: \_\_\_\_\_

Other location where it could be used: \_\_\_\_\_

\_\_\_\_\_



(f) Name the machine shown here:

Name: \_\_\_\_\_



(g) Copper is used for central heating piping. Suggest one advantage and one disadvantage of using copper for this purpose.

Advantage: \_\_\_\_\_

\_\_\_\_\_

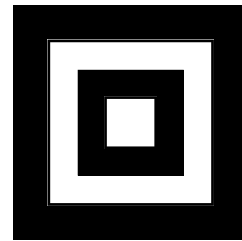
Disadvantage: \_\_\_\_\_

\_\_\_\_\_



(h) The symbol shown can be found on the rating plate of many electrical appliances. Explain what this symbol means.

Explanation: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



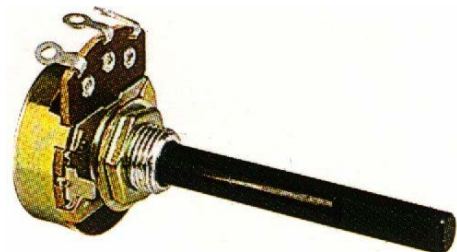
(i) A design for a child's buggy is shown. In evaluating this product explain two tests which could be carried out on it.

Test 1: \_\_\_\_\_  
\_\_\_\_\_  
Test 2: \_\_\_\_\_  
\_\_\_\_\_



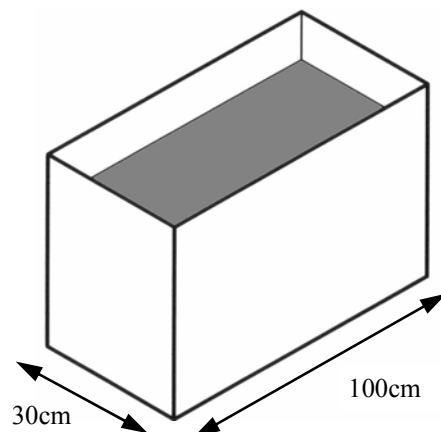
(j) Identify the electronic component shown and suggest one use for it.

Component name: \_\_\_\_\_  
Use: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



(k) A water storage tank is shown. The depth of water in the tank is 30cm. Calculate the volume of water in the tank in:

1.  $\text{cm}^3$  (cubic cms).   
2. Litres.



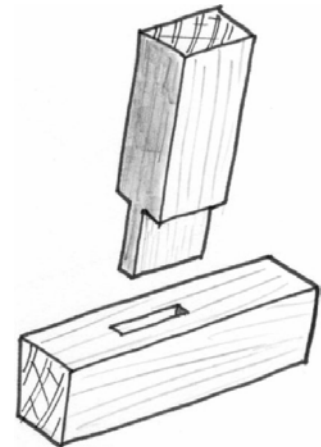
(l) A multi-meter is shown in the photograph. List three tests which may be carried out using a standard multi-meter.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_



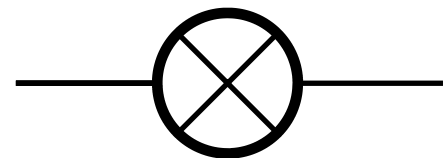
(m) The woodwork joint shown is a mortice and tenon. Identify two places where this jointing technique is used.

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_



(n) Name the component represented by the electronic symbol shown opposite.

Component: \_\_\_\_\_



(o) Explain the meaning of the sign shown here.

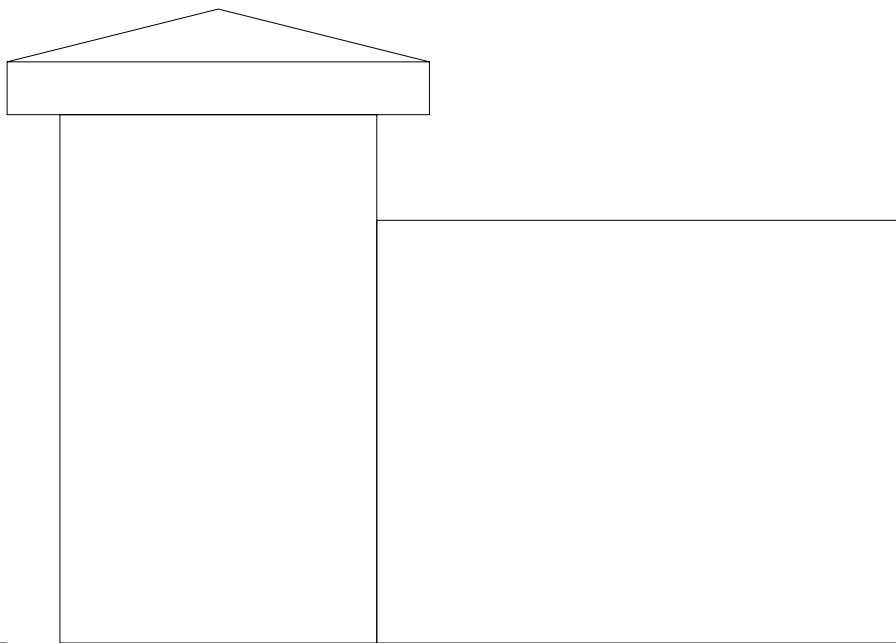
Meaning: \_\_\_\_\_  
\_\_\_\_\_



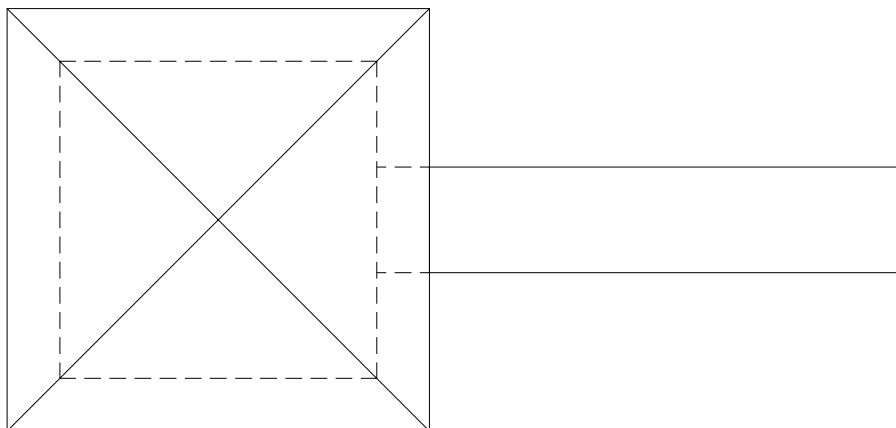
## Compulsory

### 2. Graphical Communication

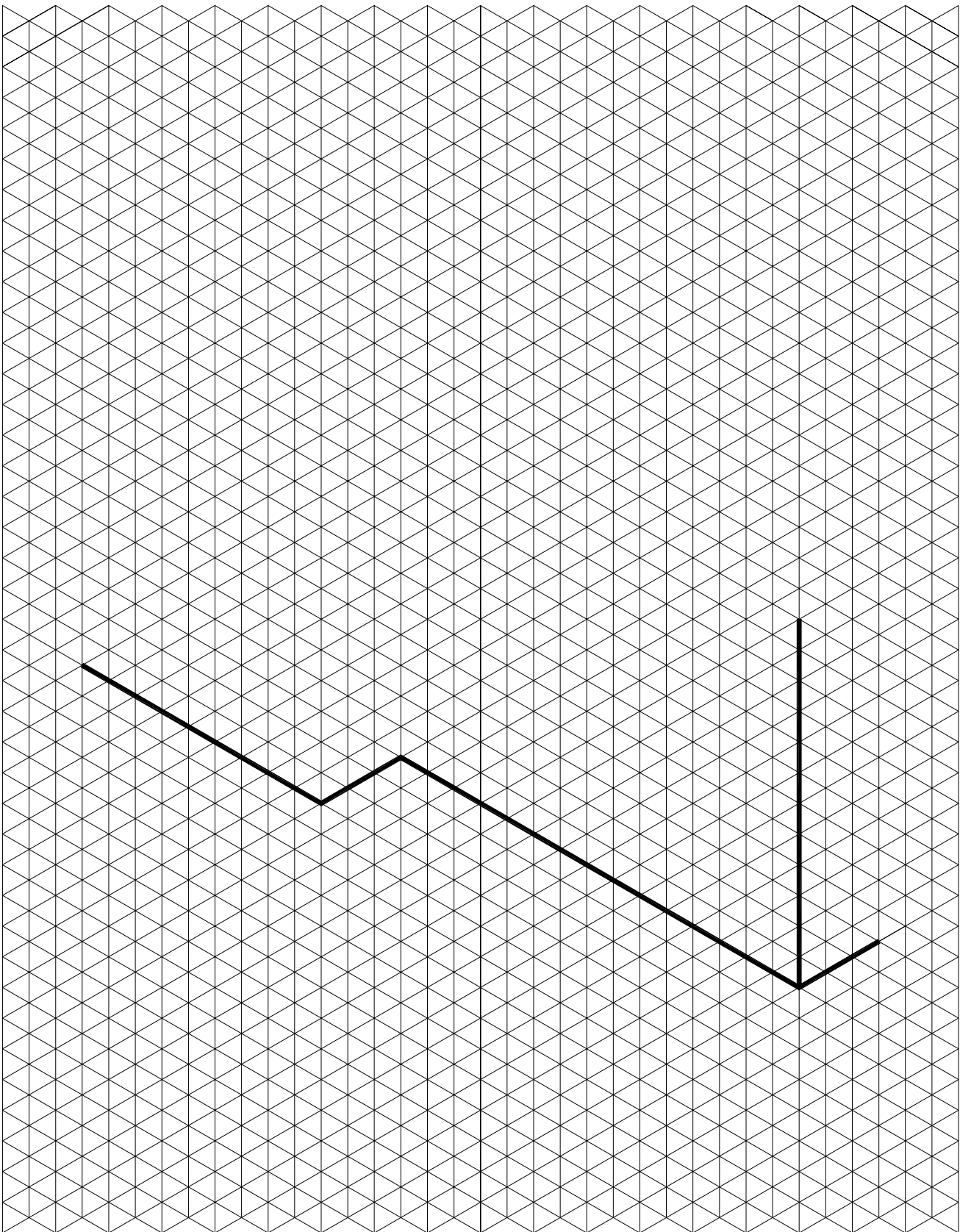
- (a) The plan and elevation of a pier and wall are shown below. Complete the isometric drawing of the pier and wall on the grid opposite. You should maintain the proportions of the pier and wall in the isometric drawing.



ELEVATION



PLAN



(b) Estimate and include 4 dimensions on your completed drawing.

# Compulsory

## 3. Health and Safety

(a) A picture of a band saw is shown. The saw is to be used to cut 3mm acrylic.

(1) How should the guide be set so as to avoid danger to the operator?

Answer: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(2) List three other safety precautions which should be observed when using this machine.

1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_

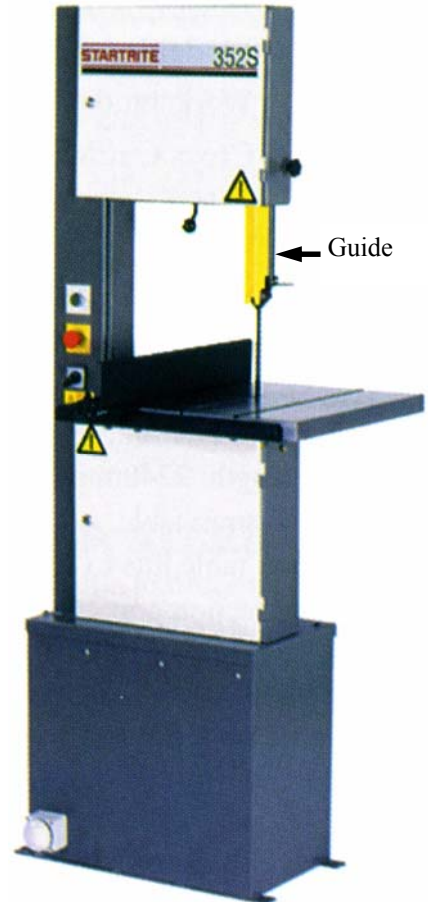
(3) Health and safety in the workshop is improved by the use of dust extractors such as that shown opposite. List two machines to which this extractor may be attached and briefly explain the effects of inhaling fine dust.

Machine 1. \_\_\_\_\_

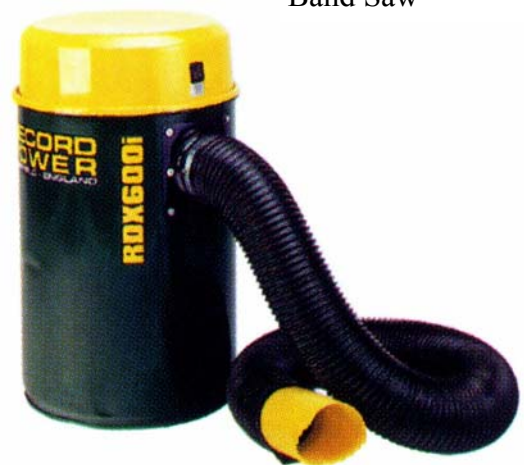
Machine 2. \_\_\_\_\_

Effects of inhaling fine dust: \_\_\_\_\_

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



Band Saw



Dust Extractor



(b) Glues are commonly used in the workshop. Explain two precautions that should be taken when using glues in an enclosed space.

Precaution 1: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Precaution 2: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



(c) The jig saw opposite is to be used to cut a rectangular piece out of a kitchen worktop so that a sink can be fitted. An extension cable is required as the cord on the jig saw is not long enough.

Explain two precautions that should be taken when using the extension cable and two precautions that should be taken when operating the jig saw.



Jig Saw

**Extension reel.**

Precaution 1: \_\_\_\_\_

\_\_\_\_\_

Precaution 2: \_\_\_\_\_

\_\_\_\_\_

**Jig Saw.**

Precaution 1: \_\_\_\_\_

\_\_\_\_\_

Precaution 2: \_\_\_\_\_

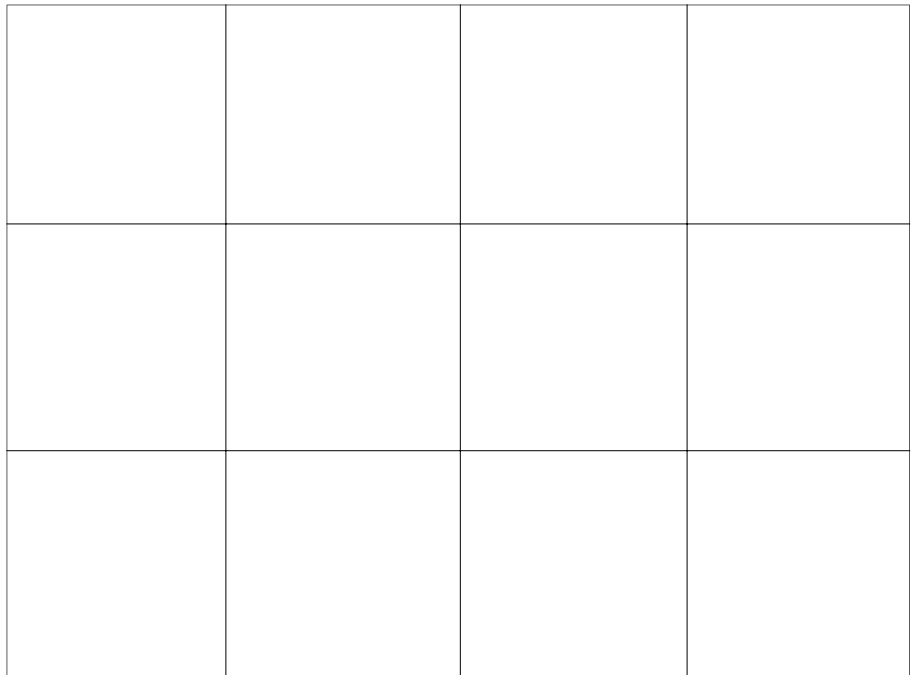
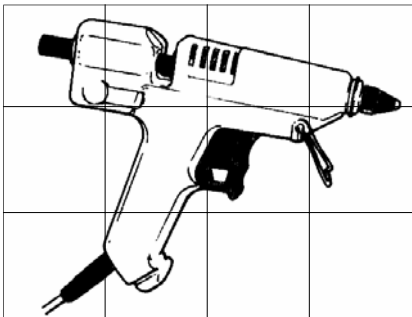
\_\_\_\_\_

Answer ANY THREE Questions from this section

**1. Introducing Technology**

(50 marks)

(a) A drawing of a glue gun is shown below. Using the grid method of enlargement, make an enlarged drawing of the glue gun.



Enlargement

(b) During manufacture a certain amount of waste material is produced. List three such materials and suggest how these may be recycled.

Material 1. \_\_\_\_\_

Recycled into: \_\_\_\_\_

Material 2: \_\_\_\_\_

Recycled into: \_\_\_\_\_

Material 3: \_\_\_\_\_

Recycled into: \_\_\_\_\_

(c) Many materials need a protective coating to improve their durability. Name two such materials, indicate the result if the material is left untreated and suggest a suitable treatment/finish.

Material	Result if left untreated	Suitable finish

(d) The drawing opposite shows a trolley for carrying bags. When setting out to design this trolley the designer had particular objectives in mind. State one possible objective.

Objective: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Research and investigation would have been carried out as part of the design process. Identify three things that the designer researched before arriving at this design.

1. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

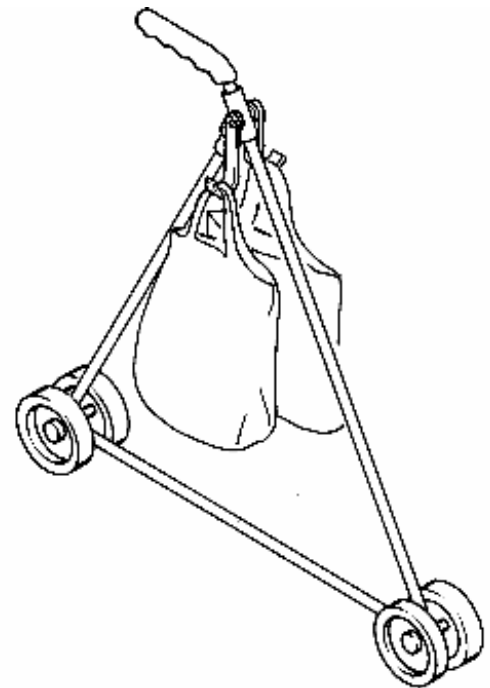
\_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Bag Trolley

## 2. Design and Manufacture

(50 marks)

- (a) The drawing opposite shows a bedside lamp.  
(1) The stem is made from a tubular material. Suggest a suitable material for the stem and briefly explain how you would bend it into the required shape.

Stem material: \_\_\_\_\_

Bending process: \_\_\_\_\_

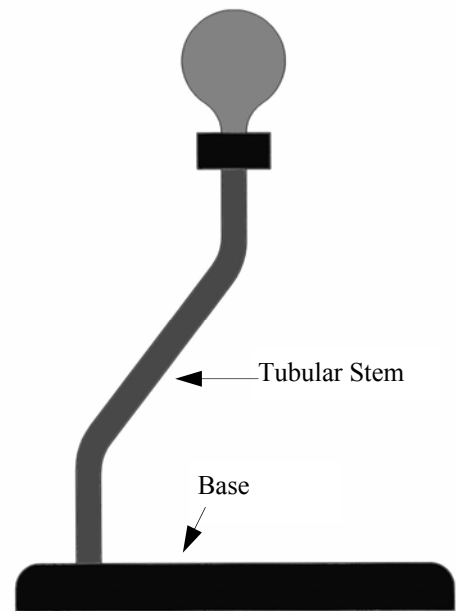
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- (2) The base is to be made from hardwood and is to be varnished. List three steps necessary to achieve a good quality finish.

Step 1: \_\_\_\_\_

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Step 2: \_\_\_\_\_

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Step 3: \_\_\_\_\_

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- (3) When placed on a bedside locker, the lamp was found to move quite easily. What steps could be taken to increase the friction between the lamp base and the top surface of the locker?

Answer: \_\_\_\_\_

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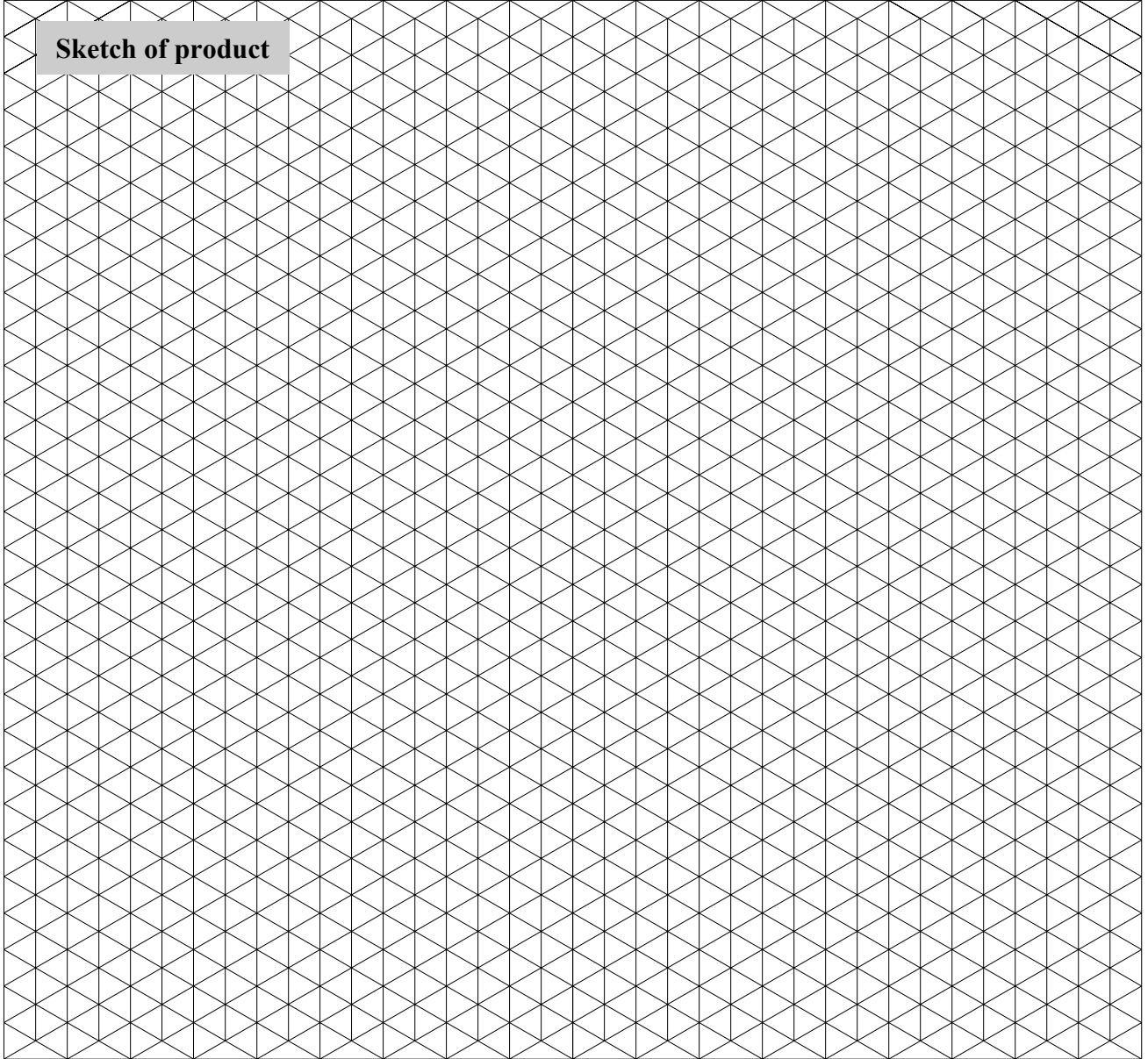
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(b) (1) In the Design and Manufacture module you designed and manufactured a product. Name the product you made and make an isometric sketch of it on the grid.

Product Name: \_\_\_\_\_

\_\_\_\_\_

**Sketch of product**



(2) Describe two stages in the manufacture of this product.

Stage 1: \_\_\_\_\_

\_\_\_\_\_

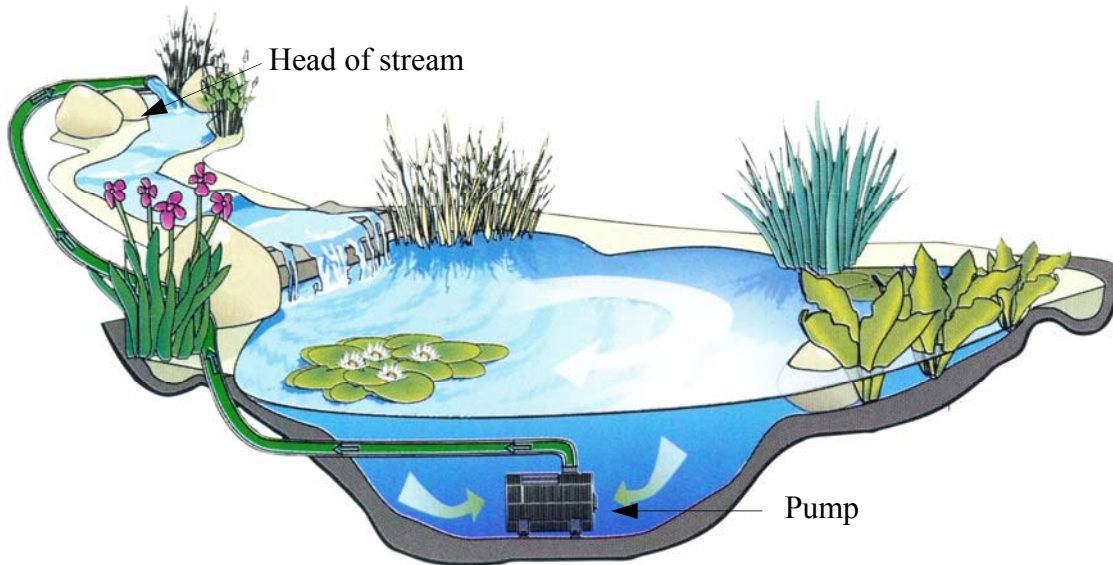
Stage 2: \_\_\_\_\_

\_\_\_\_\_

### 3. Water Technology

(50 marks)

- (a) The illustration below shows a garden pond and stream. The water flowing in the stream is pumped from the bottom of the pond to the head of the stream as shown.



- (1) The pump has a built-in filter. Explain the function of the filter.

Filter function: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- (2) The drawing opposite shows the part of the pump that draws the water into the pump and sends it to the head of the stream.



Name this part: \_\_\_\_\_

- (3) The pump is electrically powered and submerged in water. What electrical precautions must be taken in the design and fitting of pumps?

Precaution 1: \_\_\_\_\_  
Precaution 2: \_\_\_\_\_

- (b) Children are naturally attracted to garden water features. Identify two safety features of a garden pond which would reduce any risk to small children.

Safety feature 1: \_\_\_\_\_  
\_\_\_\_\_  
Safety feature 2: \_\_\_\_\_  
\_\_\_\_\_

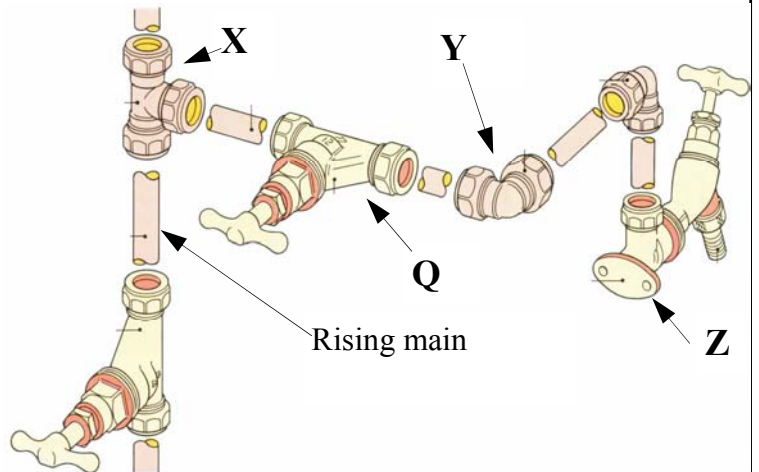
(c) The fittings needed to install an outdoor tap are shown opposite. Name each of the fittings X, Y and Z.

X: \_\_\_\_\_

Y: \_\_\_\_\_

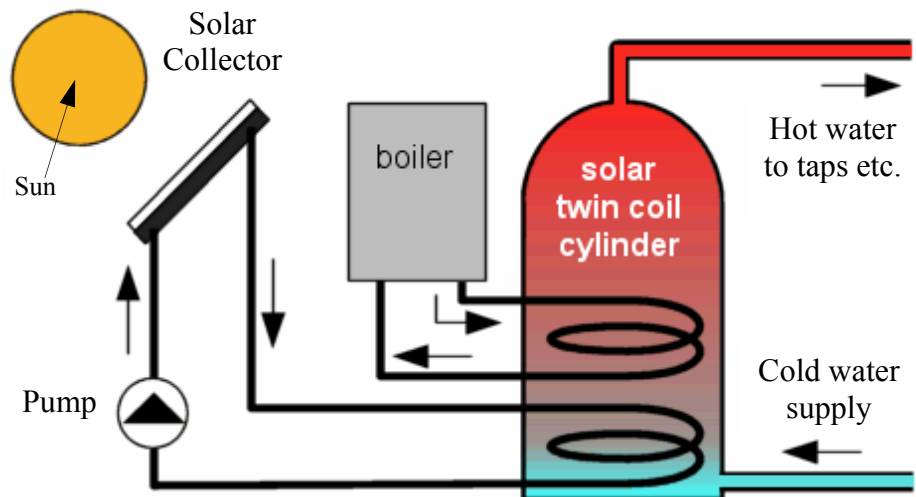
Z: \_\_\_\_\_

What is the function of component Q?



Function of Q: \_\_\_\_\_

(d) The illustration opposite shows a twin coil hot water cylinder where a boiler is heating one of the coils and a solar panel on the roof of the building is heating the other.



(1) Identify two advantages of this system compared to a standard hot water cylinder which is heated by the boiler alone.

Advantage 1: \_\_\_\_\_

Advantage 2: \_\_\_\_\_

(2) Explain the function of the pump in this system.

Answer: \_\_\_\_\_

(3) List two fuels which are commonly used to heat our homes.

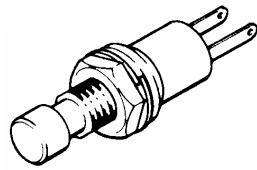
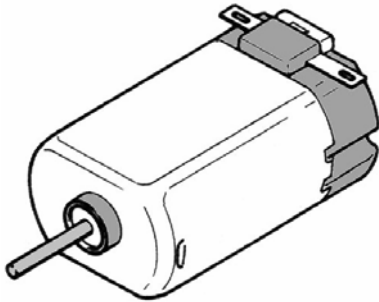
Fuel 1: \_\_\_\_\_ Fuel 2: \_\_\_\_\_

## 4. Electrical Understanding and Basic Electronics

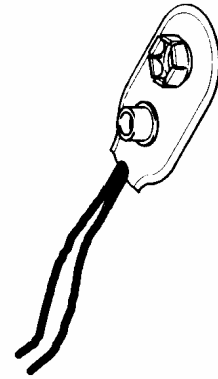
(50 marks)

- (a) Show how the switch, motor and battery snap below can be joined so that the motor can be switched on and off.

Motor



Push to make switch



Snap

- (b) The circuit diagram of an electronic sensor is shown

- (1) Identify the type of sensor.

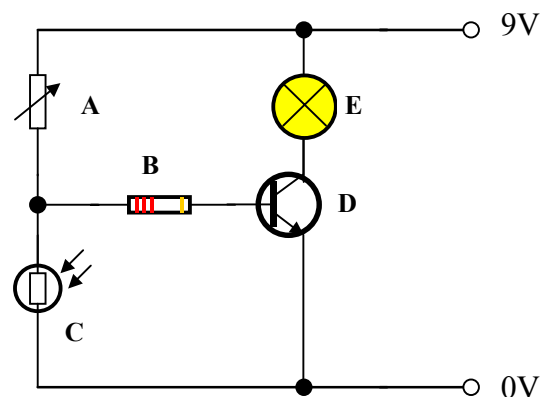
Type of sensor: \_\_\_\_\_

- (2) Identify the components A,B,C,D and E.

A: \_\_\_\_\_

B: \_\_\_\_\_ D: \_\_\_\_\_

C: \_\_\_\_\_ E: \_\_\_\_\_

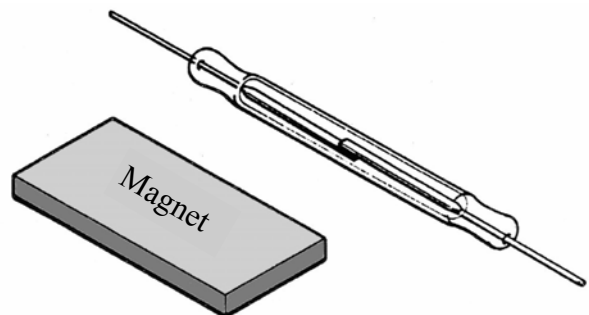


- (c) Name the type of switch shown opposite and give one example of where it is used.

Name: \_\_\_\_\_

Use: \_\_\_\_\_

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





- (d) (1) The photograph shows a 3 pin plug. Name the three pins X, Y and Z.

X: \_\_\_\_\_ Y \_\_\_\_\_

Z: \_\_\_\_\_

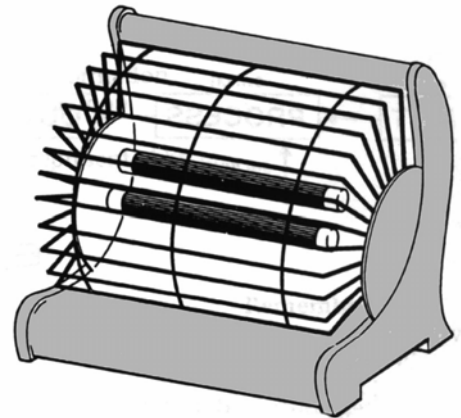
Which of the pins is connected to the fuse?

Answer: \_\_\_\_\_



- (2) A 2kW electric heater is operated for 3 hours per day. If the cost of a unit of electricity is 15 cent, what is the cost of running this heater for 1 week?

**Solution:**



- (3) A fuse for a plug connected to a 2.4kW electric heater is required. If the voltage is 240V, calculate the size of fuse necessary for the plug. The fuse size must be selected from the following list: (1A, 3A, 5A, 10A, 13A or 20A).

**Solution**

- (4) In relation to domestic electricity explain the following terms:

Consumer Unit: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Bonding: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## 5. Tools & Equipment

(50 marks)

(a) A range of equipment found in workshops is shown.

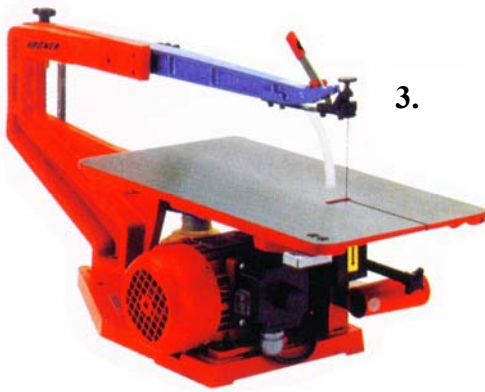
1.



2.



3.



4.



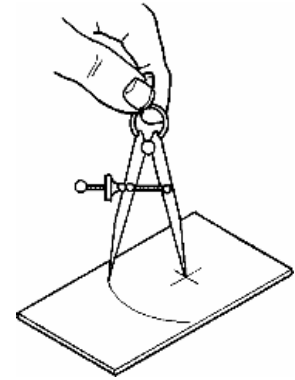
Name each piece of equipment and give a use for each.

No.	Name	Use
1		
2		
3		
4		

(b) Name the marking-out tool shown and list four materials on which this tool may be used.

Name: \_\_\_\_\_

Materials 1. \_\_\_\_\_ 2. \_\_\_\_\_  
3. \_\_\_\_\_ 4. \_\_\_\_\_



(c) In the space below, sketch three of the following tools: Try square, Tenon saw, Coping saw, Claw hammer, Hack saw, Mallet. Use colour shading where appropriate.

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