



Coimisiún na Scrúduithe Stáit
State Examinations Commission
Leaving Certificate Applied 2006

Vocational Specialism - Technology
(240 Marks)

Wednesday 14th June 2006
Afternoon 2.00 pm to 4.00 pm

For the superintendent only

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| Centre Stamp |
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|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--|
| 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 Mór-Iomlán box on the script | | |

General Directions

1. Write your examination number in this space:

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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.

Question 1

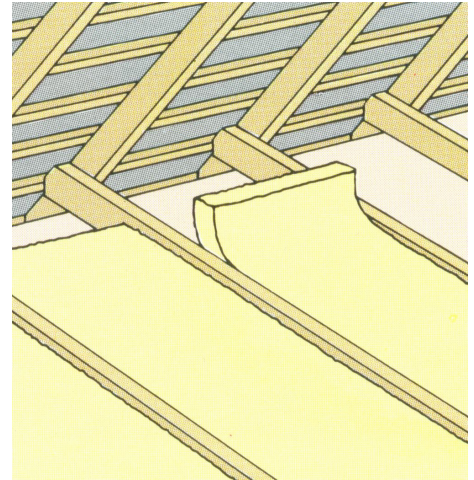
(40 marks)

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

(a) The picture shows insulation in an attic space.
Name the type of insulation used for this purpose and the reason for using it:

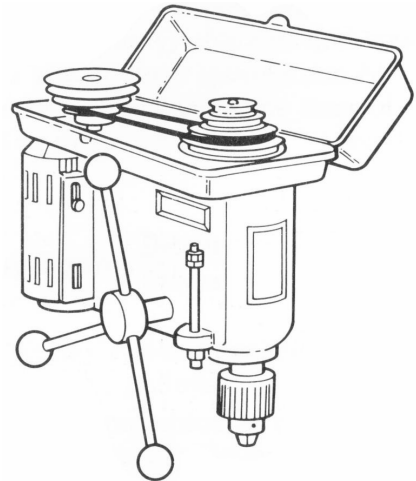
Insulation type: _____

Reason for using: _____



(b) Explain why cone pulleys are used in drills such as that shown here:

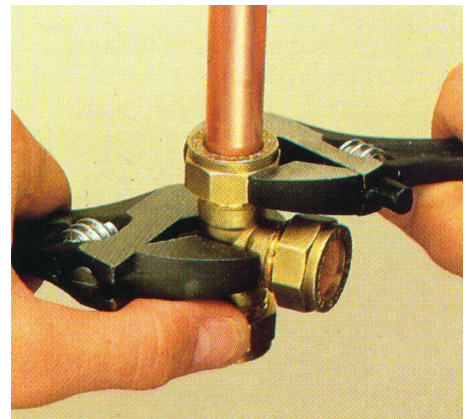
Explanation: _____



(c) Name the type of plumbing fitting in the photograph and name the material from which it is made:

Type of fitting: _____

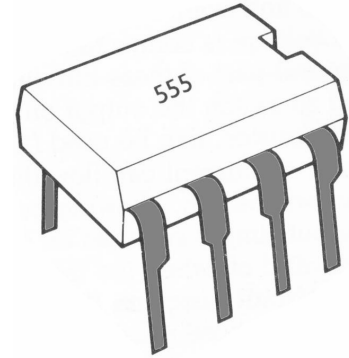
Material _____



(d) A 555 timer IC is shown. Explain the meaning of the term IC and suggest an advantage of using ICs in electronic circuits.

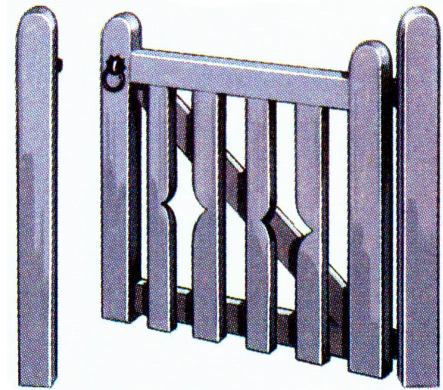
IC: _____

Advantage of ICs: _____



(e) The illustration shows a garden gate with a diagonal brace. Explain the function of this brace.

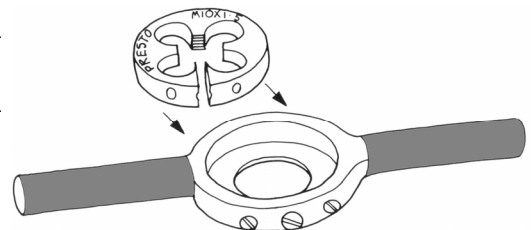
Function of the brace: _____



(f) Name the tool shown here and explain its function.

Name: _____

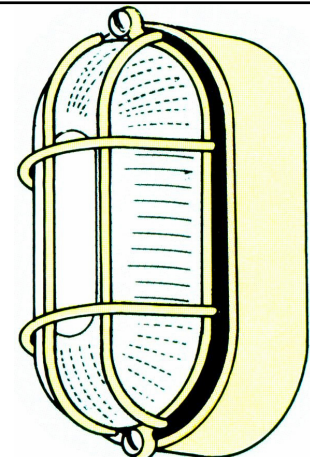
Function: _____



(g) A bulkhead light fitting is shown. Suggest where this fitting could be used and explain why there is a rubber seal between the glass and the lamp housing:

Where used. _____

Why there is a rubber seal: _____



- (h) When using an extension reel such as that shown here, it is always advisable to fully unravel the cable from the reel. Explain why this precaution should be followed:

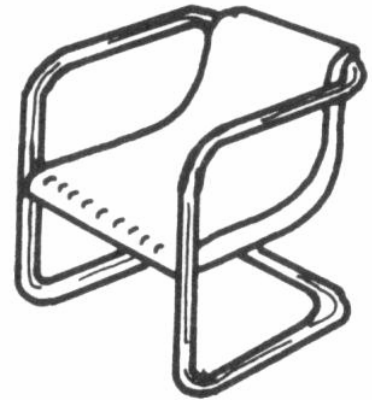
Explanation: _____



- (i) When the designer of this chair was designing it, he had a number of objectives in mind. Suggest two such objectives.

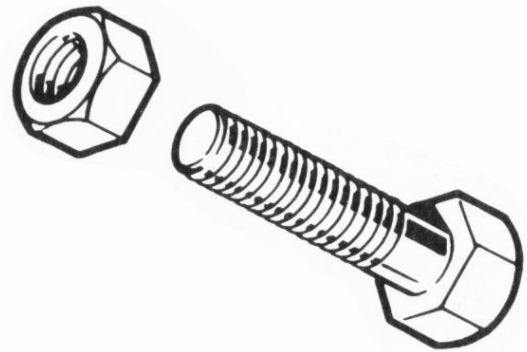
Objective 1: _____

Objective 2: _____



- (j) The illustration shows an **M10** nut and bolt. What does the **M** in **M10** stand for?

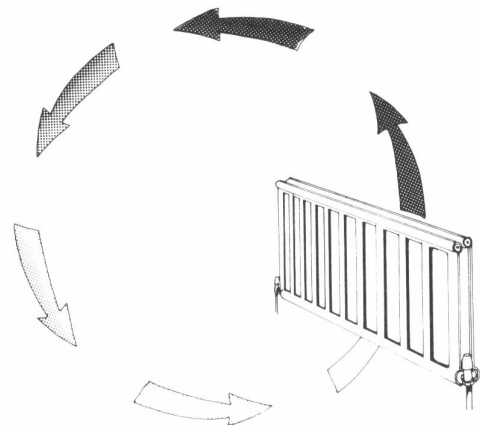
Answer: _____



- (k) The illustration shows how heat is transmitted from a radiator. What is the name given to this type of heat transfer?

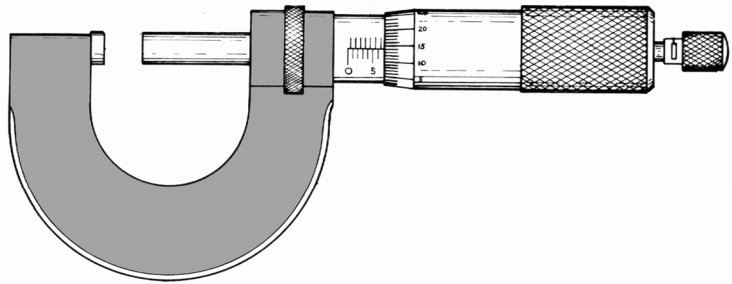
Type of heat transfer: _____

Why is it better to place a radiator below a window ?



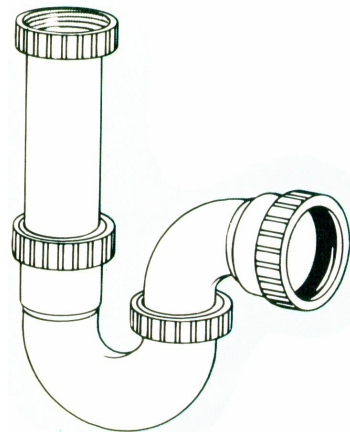
(l) Name the measuring tool shown here.

Name: _____



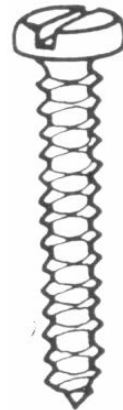
(m) Name the type of plumbing fitting shown here and give one example of where it may be used.

Name: _____
Where used: _____



(n) The illustration shows a pan head self tapping screw. What does the term "self tapping" mean?

Answer: _____



(o) Identify the tool shown here and give one example of its use.

Name of tool: _____
Where used: _____

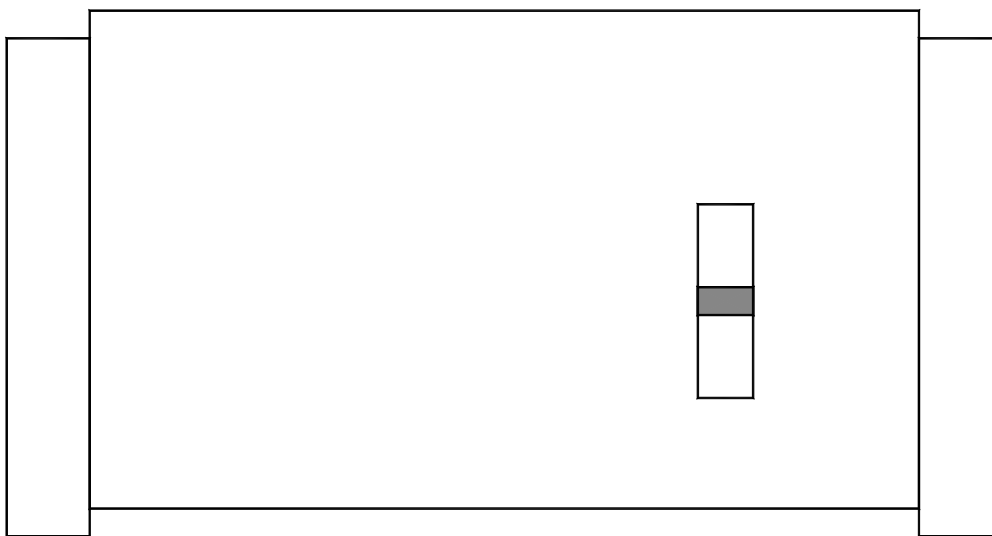


Compulsory

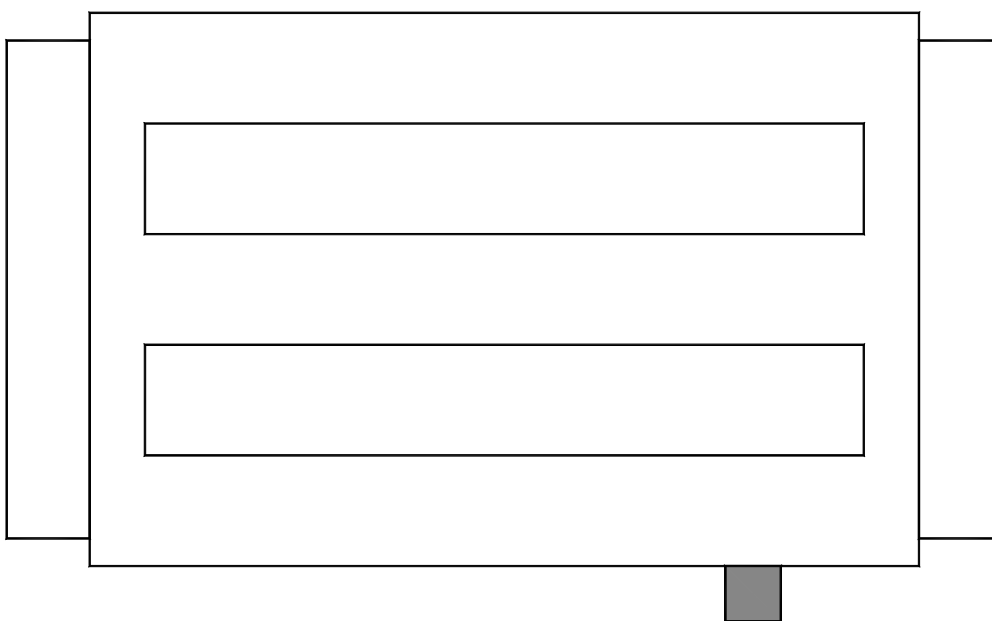
2. Graphical Communication

The plan and elevation of a toaster are shown below.

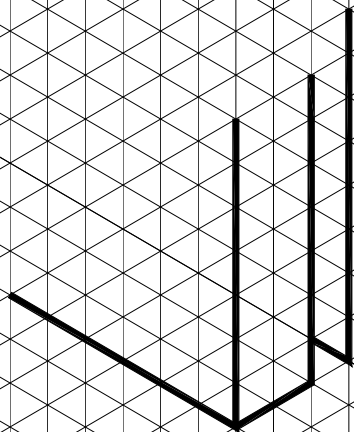
- (a) Complete the isometric drawing of the toaster on the grid opposite. You should maintain the proportions of the toaster in the isometric drawing.



ELEVATION



PLAN



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

Compulsory

3. Health and Safety

(a) A picture of a belt sander is shown. The sander is to be used to sand a long piece of hardwood.

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

1. _____

2. _____

3. _____

(2) A picture of a metal turning lathe is shown. List three safety precautions which must be observed by the operator of this machine.

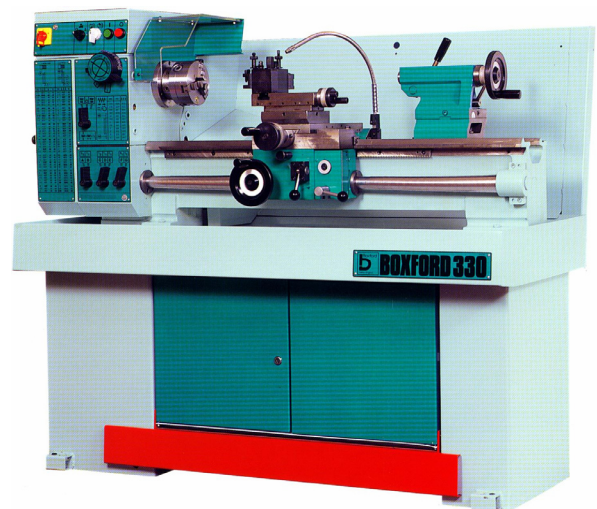
1. _____

2. _____

3. _____



Belt Sander



Lathe

(b) A person cuts his/her hand while using a jigsaw and is feeling quite faint. Identify three immediate steps that should be taken to assist this person.

1. _____

2. _____

3. _____

(c) The images show two devices used to protect the eyes and in the case of the face shield, the entire face. Identify five workshop activities which would require the use of either of these pieces of safety equipment.

1. _____

2. _____

3. _____

4. _____

5. _____



Safety Goggles



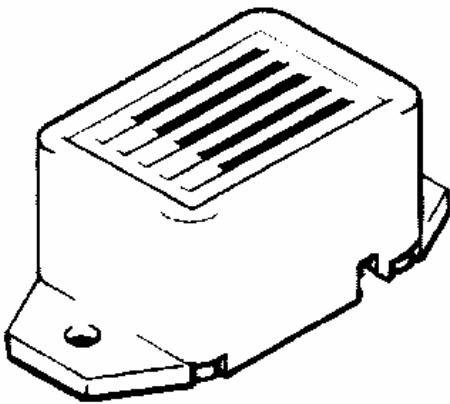
Face Shield

Answer ANY THREE Questions from this section

1. Introducing Technology

(50 marks)

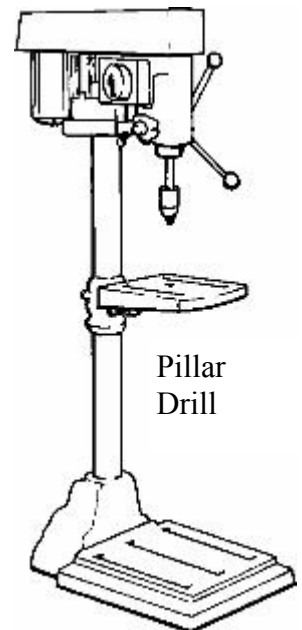
- (a) A drawing of an electronic buzzer is shown below. In the space provided, sketch a well proportioned plan of the buzzer. Insert any two dimensions.



PLAN

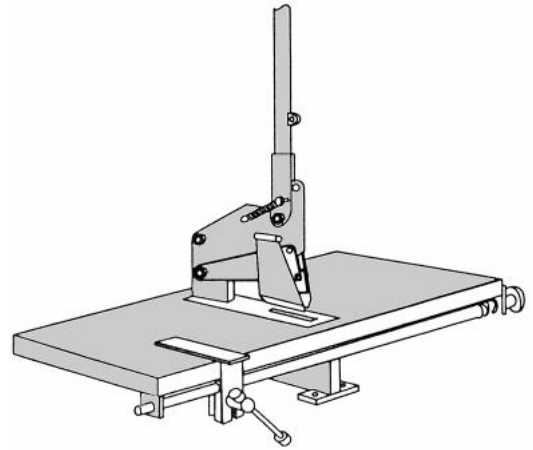
- (b) An illustration of a pillar drill is shown. Explain three things that you would do on a regular basis to ensure that the pillar drill remains in good working order.

1. _____
2. _____
3. _____



(c) Explain the function of this machine:

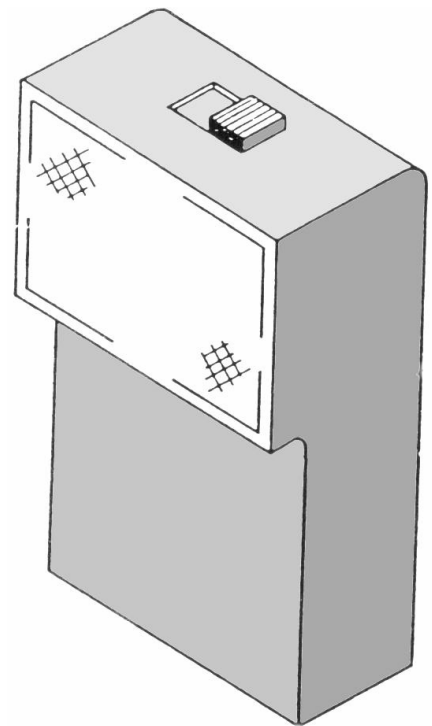
Answer: _____



(d) The drawing opposite shows a student's design for a bicycle lamp.

(1) In the space below make a sketch of a bracket to be attached to the rear of the lamp so that the lamp can be secured to the handlebars of the bicycle.

Bracket Design



Bicycle Lamp

(2) In evaluating this product, explain three tests that you would use to test its effectiveness as a bicycle lamp.

1. _____

2. _____

3. _____

2. Design and Manufacture

(50 marks)

- (a) The drawing shows the end view and elevation of a trundle wheel used for measuring distance. Each revolution of the wheel is equal to 1 metre of distance. The wheel revolves freely on the axle.

- (1) Name a suitable material for the wheel, axle and handle.

Wheel: _____

Axle: _____

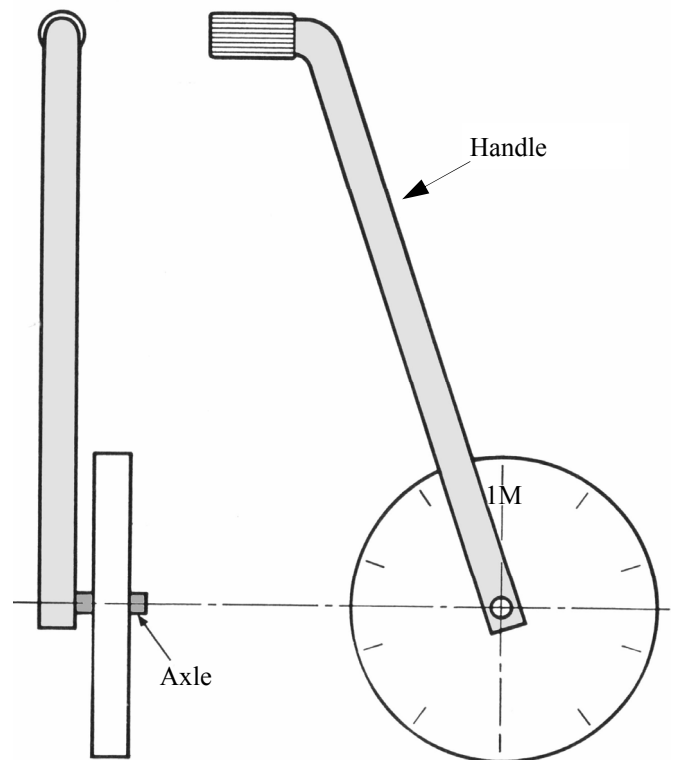
Handle: _____

- (2) The trundle wheel is to be used by primary school children. Identify two ways in which this would influence the design of this device.

1. _____

2. _____

- (3) The wheel must be fixed securely to the axle while being free to rotate. Using sketches in the space below, show how the axle is fitted to the handle and how the wheel is fitted to the axle. It must be possible to remove the wheel from the axle.

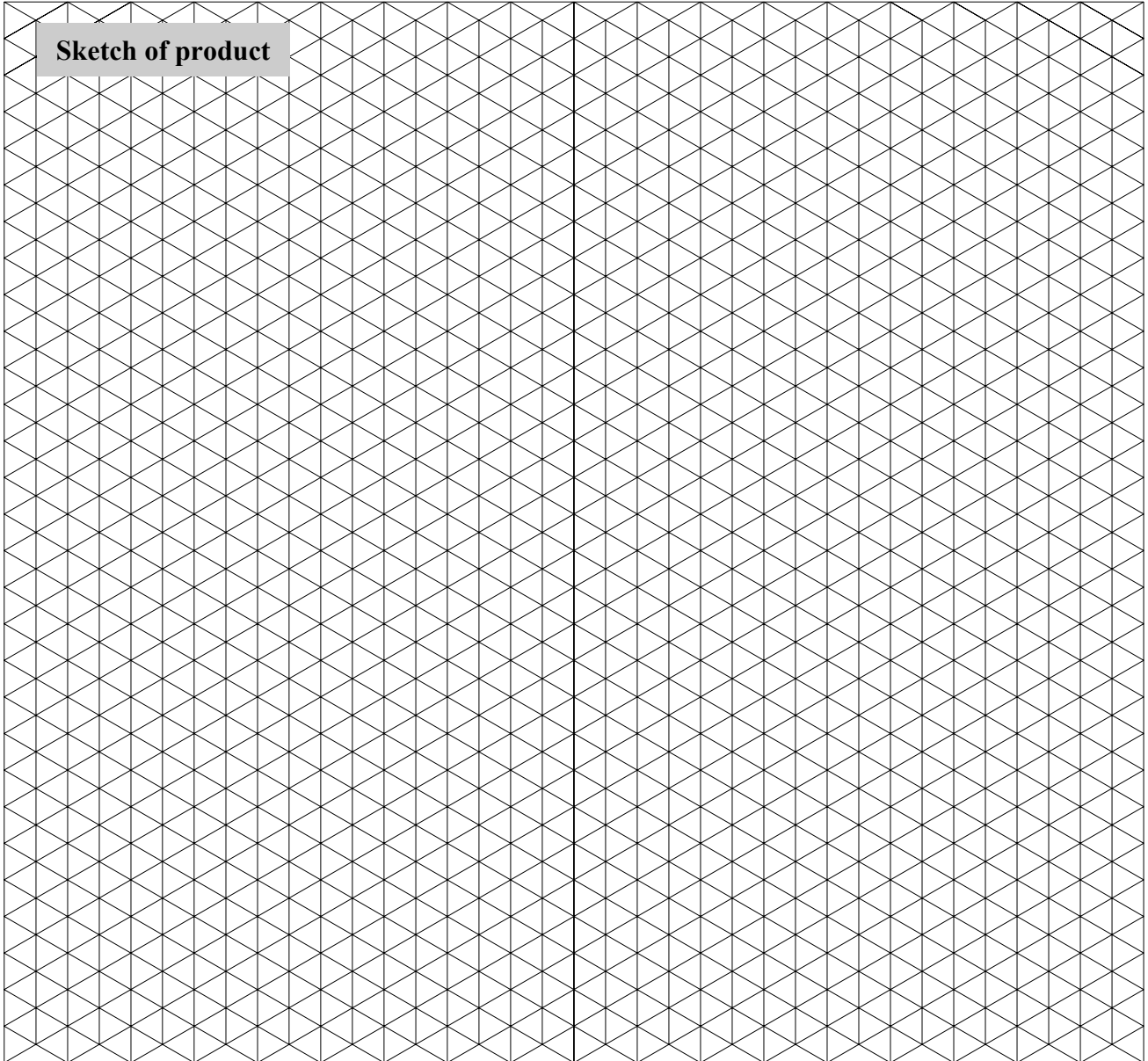


Trundle Wheel

(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 below on the grid.

Product Name: _____

Sketch of product



(2) Describe two sources of information you used when researching this product:

Source 1: _____

Source 2: _____

3. Water Technology

(50 marks)

(a) The picture shows an indoor water feature.

(1) Suggest a suitable material for part X of the feature:

Material: _____

(2) Identify three important factors which had to be considered when selecting the pump for this water feature.

1. _____

2. _____

3. _____



(b) An outdoor water feature constructed in stone is shown. Water is pumped out through a hole in the top and it cascades down the sides of the column.

(1) Explain how you would construct this water feature.

Stage 1: _____

Stage 2: _____

Stage 3: _____



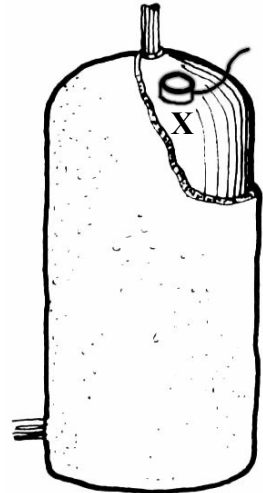
(2) Suggest a suitable stone for this type of construction and give one reason for your choice:

Suitable stone: _____ Reason for choosing: _____

(c) (1) The illustration shows an insulated hot water cylinder for a domestic dwelling. Give two reasons why hot water cylinders should be insulated.

1. _____

2. _____



Hot water cylinder

(2) Identify the device shown at "X" on the hot water cylinder.

Name of device "X" _____

(d) A single stack drainage system for a domestic dwelling is shown.

(1) Identify the fittings A, B and C in the illustration.

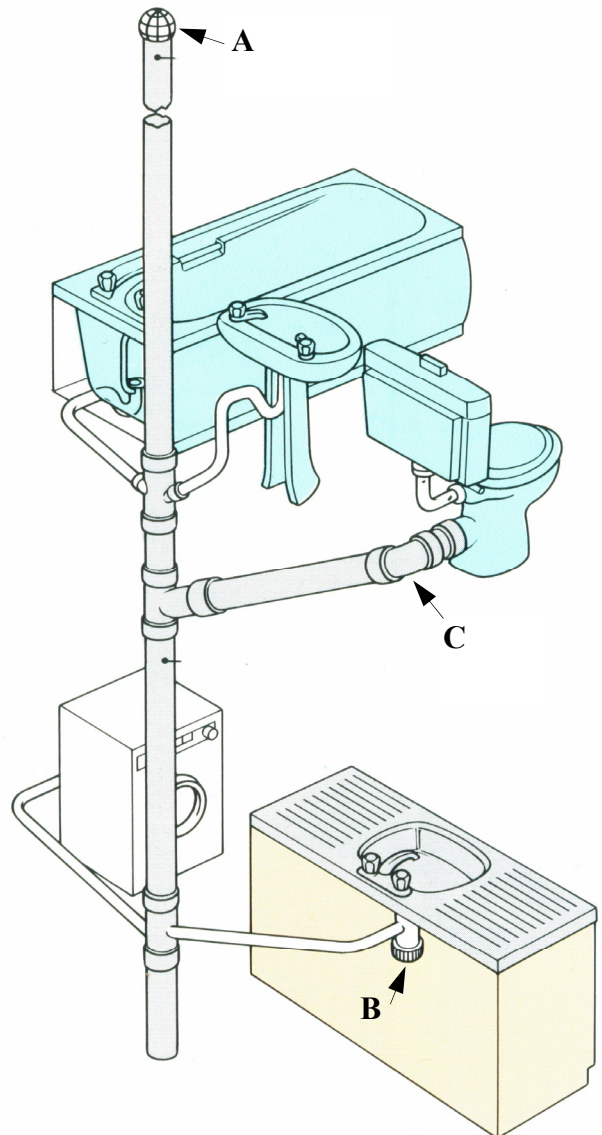
- A: _____
 B: _____
 C: _____

(2) What is the function of fitting A in this system?

(3) Name the material which is generally used for this pipe-work and give a reason.

Material: _____

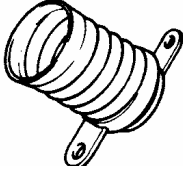
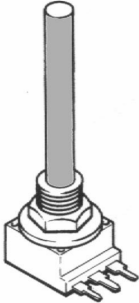
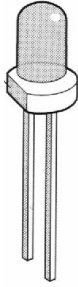
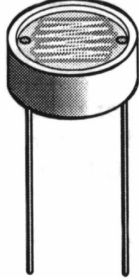
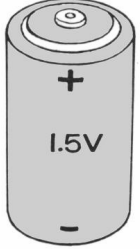
Reason: _____



4. Electrical Understanding and Basic Electronics

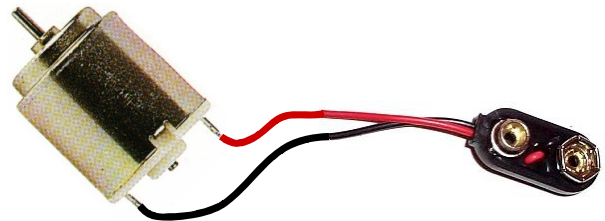
(50 marks)

(a) Identify the Electronic components in the table below:

| | | | | | |
|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| |  |  |  |  |  |
| Name | | | | | |

(b) When connected to a 9V battery the current through the motor is 300mA (0.3 Amps). Using Ohm's Law, calculate the resistance of the motor.

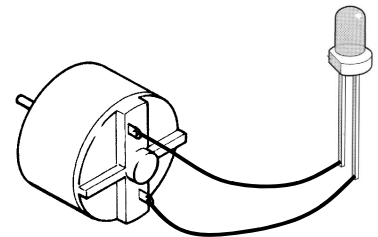
Solution:



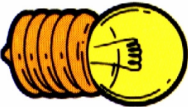


Miniature motor and battery snap

(c) (1) The illustration shows a motor connected to a LED. Spinning the motor shaft will produce enough voltage to light the LED. What energy conversion is taking place here?

Energy conversion: _____



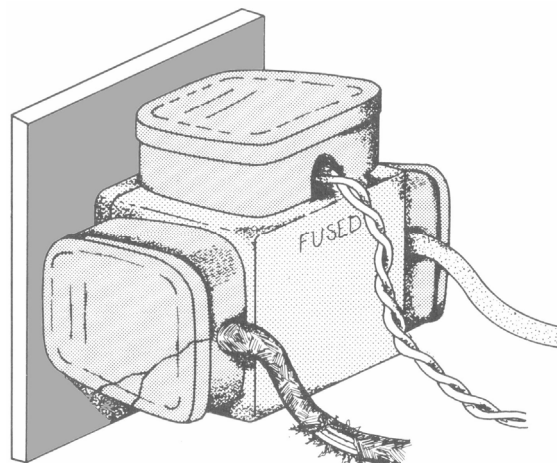
(2) Complete the table below by filling in the type of energy conversion for each component.

| Component | Type of energy | to | Type of energy |
|-------------------------------------------------------------------------------------|----------------|----|----------------|
|  | | → | |
|  | | → | |
|  | | → | |

(d) (1) The sketch shows three plugs in an adaptor which is plugged into a wall socket. Identify two safety hazards associated with this.

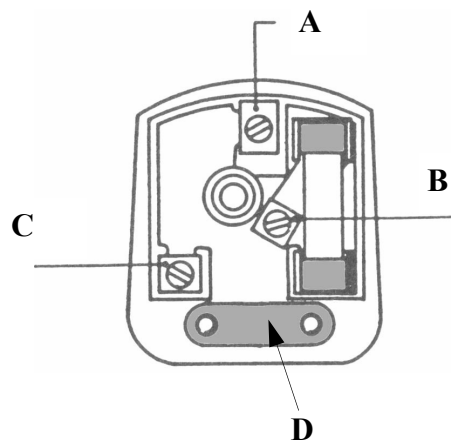
1. _____

2. _____



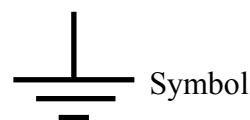
(2) The illustration shows an open three pin plug. Identify the terminals A, B and C and the part D.

- A: _____
 B: _____
 C: _____
 D: _____



(3) What does this symbol represent?

Answer: _____



(4) The formula to calculate power is:

$$\text{Power} = \text{Voltage} \times \text{Current}$$

Using this formula calculate the current through a 720 watt motor if the voltage is 240 volts.

Solution:

(5) What is the function of an **Earth Rod**?

Answer: _____

5. Tools & Equipment

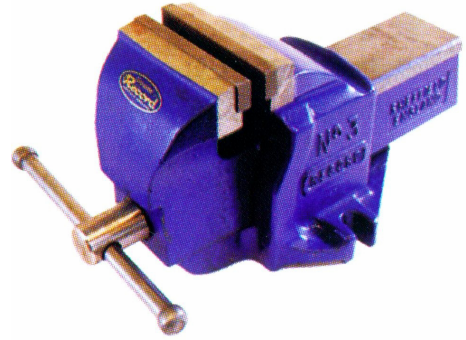
(50 marks)

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

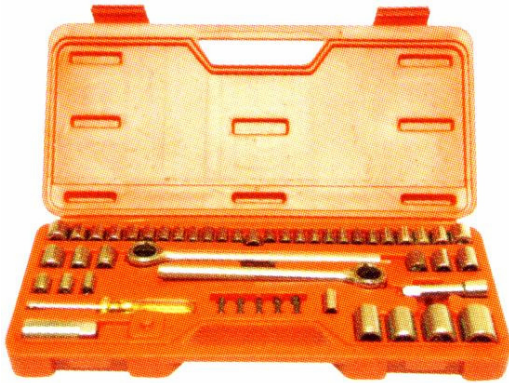
1.



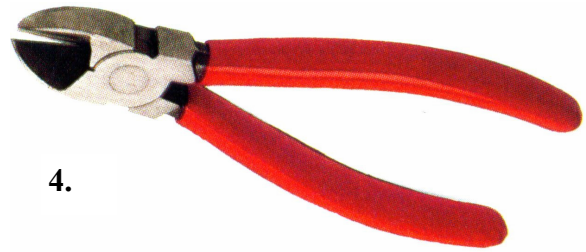
2.



3.



4.



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

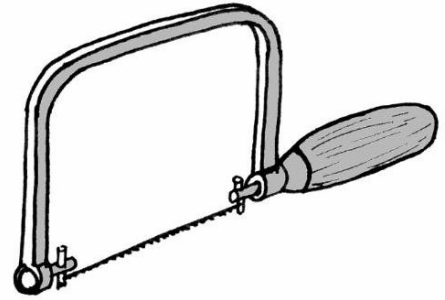
| No. | Name | Use |
|-----|------|-----|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

(b) Name this tool, suggest a use for it and identify the force acting on the blade.

Tool name: _____

Use: _____

Force on the blade: _____



(c) In the space below, sketch **two** of the following tools: Spring dividers, Cold chisel, Jack plane, or Junior hack-saw. Use colour shading where appropriate.

(d) (1) Identify this tool and name a machine for which it is needed.

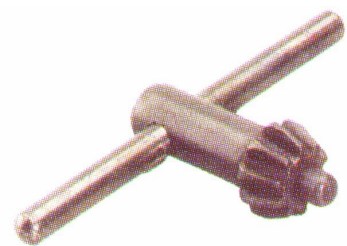
Name of tool: _____

Machine: _____

(2) Identify this tool and suggest a use for it:

Name of tool: _____

Possible use: _____



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For Examiner Use only

Total mark

| QUESTION | MARKS |
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| SECTION 1 | |
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| Q.1. | |
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| Q.2. | |
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| Q.3. | |
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| SECTION 2 | |
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| Q.1. | |
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| Q.2. | |
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| Q.3. | |
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| Q.4. | |
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| Q.5. | |
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