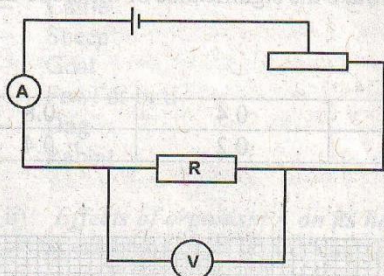


**WASSCE / WAEC Integrated Science Nov / Dec 2012 Past Questions and Answers (Practical)**

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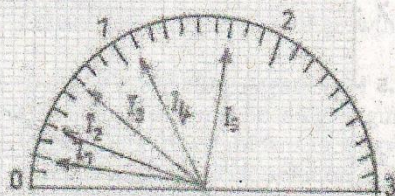
1. **Figure 1 (a)** is an illustration of an electric circuit used to investigate Ohm's Law.



**Figure 1a**

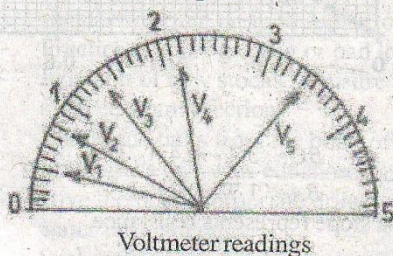
Figure 1 (b) shows five ammeter readings  $I = I_1, I_2, I_3, I_4$  and  $I_5$  while figure 1 (c) also shows the corresponding voltmeter readings  $V = V_1, V_2, V_3, V_4$  and  $V_5$ .

*Study the figures carefully and answer the questions that follow.*



Ammeter readings

**Figure 1b**



Voltmeter readings

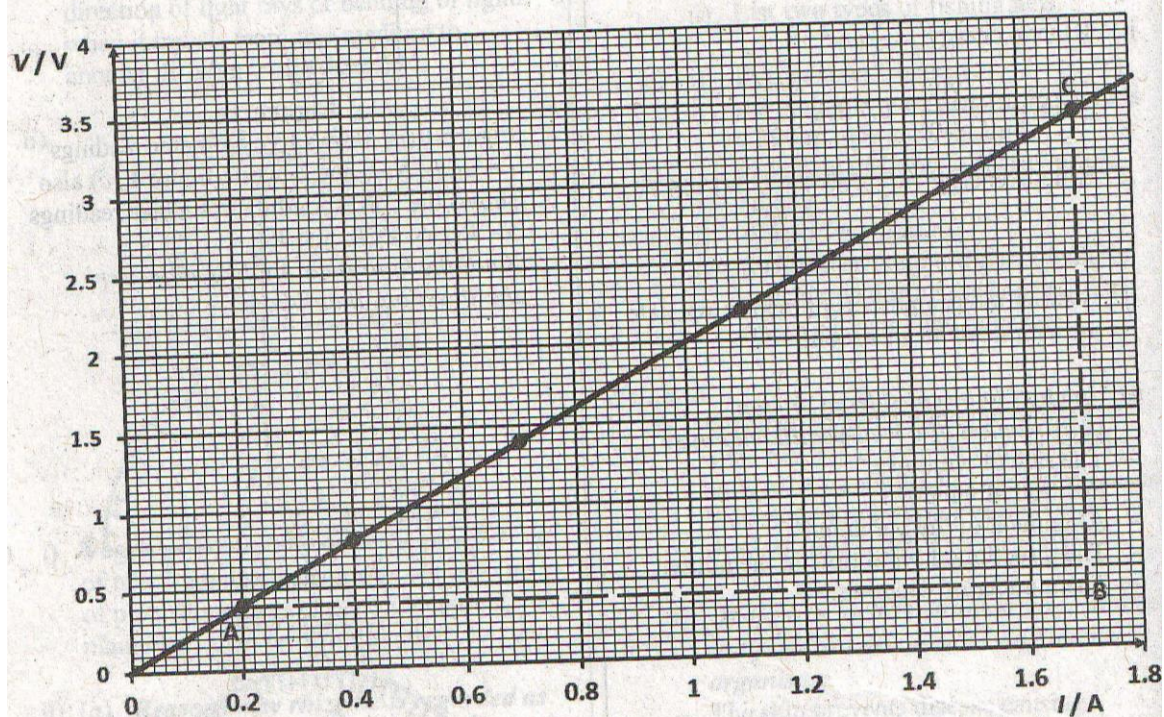
**Figure 1c**

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- a) Read and record in a tabular form the ammeter readings,  $I = I_1, I_2, I_3, I_4$  and  $I_5$  and the corresponding voltmeter readings  $V = V_1, V_2, V_3, V_4$  and  $V_5$ .
- b) Plot a graph with  $V$  on the vertical axis and  $I$  on the horizontal axis.
- c) i) Determine the slope of the graph.  
ii) State the significance of the slope determined in (c) (i).

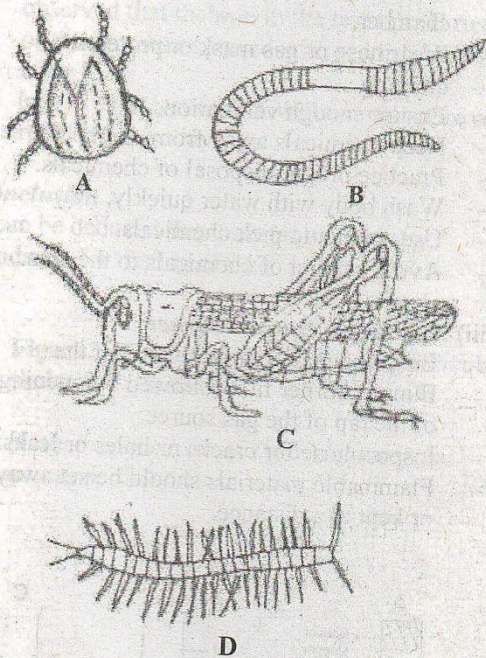
ution

$V/V$	0.4	0.8	1.4	2.2	3.4
$I/A$	0.2	0.4	0.7	1.1	1.7



- c) i) Slope =  $\frac{BC}{BA} = \frac{3.4 - 0.4}{1.7 - 0.2} = \frac{3}{1.5} = 2.0 \Omega$   
ii) The slope represents resistance.

2. Figure 2 is an illustration of organisms of agricultural importance. Study the figure carefully and answer the questions that follow.



- a) Identify each of the organisms A, B, C, and D.
- b)
  - i) Name one host of organism A.
  - ii) State two effects of organism A on its host.
  - iii) State three ways of controlling organism A.
- c) Name two crops that are attacked by organism D.
- d) State three ways in which organism B improves soil fertility.

**Solution**

- a)
  - A – Tick
  - B – Earthworm
  - C – Grasshopper
  - D – Centipede
- b)
  - i) **Host of organism A**
    - Cattle
    - Sheep
    - Goat
    - Fowl or bird
    - Dog
    - Rabbit
  - ii) **Effects of organism A on its host**
    - Sucks blood of its host or causes anaemia or sucks nutrients or host grows lean.
    - Damages the skin of its host or affects the quality of the host's skin.
    - Causes injuries or wounds on its host.
    - Acts as a vector of diseases or infects with pathogens or causes death or deviates from normal healthy nature.
    - Causes irritation or restlessness or itchiness
    - Causes deformity or stunted growth.
  - iii) **Ways of controlling organism A**
    - Changing the animal beddings regularly.
    - Regular dipping of animals or spraying animals with a acaricide solution or with insecticide spray or dusting or pesticide or disinfectants.
    - Keeping animal surroundings clean or regular weeding or good sanitation.
    - Practice rational grazing or pad locking.
    - Isolation of new stocks to ensure that they are free from infection.
    - Hand-pick ticks from the body of the host.
    - Keep grass or weeds cut short.
    - Give the host appropriate drug through water or drenching.
    - Seal entry points used by rodents, squirrels etc to the house.

c) **Ways in which organism B improves soil fertility**

- Their burrowing activities create holes or spaces in the soil which improve soil aeration.
- Dead and decaying soil organisms increase the organic matter or humus in the soil.
- Assists in the decomposition or disintegration of organic matter leading to release of nutrients to the soil.
- Their activities assist in the mixing of soil with organic matter or they improve nutrient recycling in the soil or they improve soil texture.
- Creates holes in the soil to improve drainage.
- Improves soil structure.

3. a) State **two** safety precautions **each** to be taken when performing **each** of the following activities in the laboratory:

- i) diluting concentrated sulphuric acid with water;
- ii) handling poisonous chemicals;
- iii) lighting a Bunsen burner.

- b) With the aid of diagrams, describe briefly an experiment you would perform in the school laboratory to show that water is a necessary condition for rusting of iron.

**Solution**

- a) i) **Diluting concentrated sulphuric acid**
- The acid must be added to the water.
  - Stir constantly.
  - The acid should be added slowly to the water.
  - Any spill of the acid on the body must be washed quickly with plenty of water.
  - Wearing protective clothing or spectacles or goggles.
  - Wear nose mask.

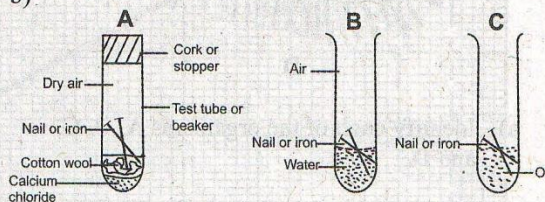
ii) **Handling of poisonous chemicals**

- Do not smell chemicals.
- Do not taste chemicals or eat chemicals or inject chemicals.
- Chemicals should be kept in fume chamber.
- Wear nose or gas mask or protective clothing.
- Ensure enough ventilation.
- Keep chemicals away from heat.
- Practice proper disposal of chemicals.
- Wash body with water quickly.
- Use spatula to pick chemicals.
- Avoid contact of chemicals to the skin.

iii) **Lighting a Bunsen burner**

- Light the match to the nozzle of the Bunsen burner first followed by opening of the tap of the gas source.
- Inspect hose for cracks or holes or leaks.
- Flammable materials should be set away or kept at a distance.

b)

**Method**

- Take two test tubes and label them separately as test tube A and test tube B.
- Into test tube A place some quantity of anhydrous calcium chloride or drying agent or oil.
- Seal it with plug to dry the air inside.
- Place some quantity of cotton wool on top of the calcium chloride.
- Put a few iron nails on top of the cotton wool in the test tube.
- Cover the test tube with the seal.
- Leave it for a few days or leave it for 3-4 days.
- Put some water into test tube B.
- Place few iron nails into the test tube.

- Leave it open for a few days or 3-4 days or for long time.

**Observation**

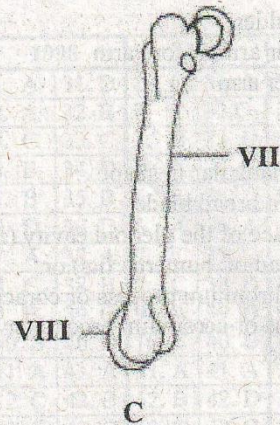
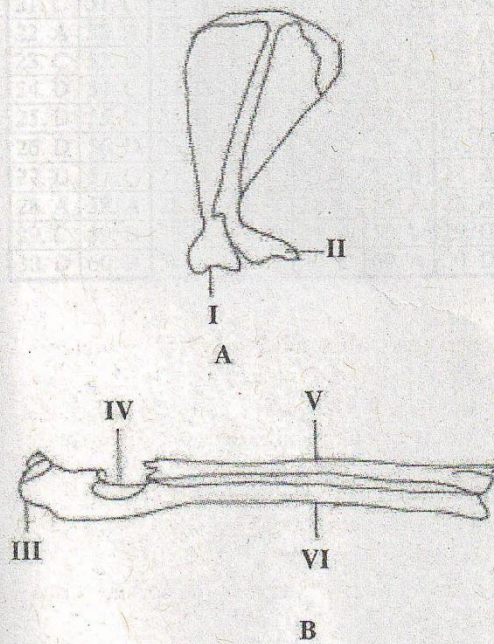
- At the end of the experiment it would be observed that the iron in the test tube B rusted or the iron was covered with reddish brown layer.
- Iron nails in test tube A will not rust or have no reddish brown layer.

**Conclusion**

It can be deduced that water is a necessary condition for rusting of iron.

4. **Figure 3** illustrates bones of the appendicular skeleton in mammals.

Study the figure carefully and answer the questions that follow.



- Identify **each** of the bones **A**, **B** and **C**.
- Name **each** of the parts labelled **I**, **II**, **III**, **IV**, **V**, **VI**, **VII** and **VIII**.
- State the location in the mammalian body where **each** of the bones **A**, **B** and **C** is found.
- State **one** observable characteristic feature each of bones **A**, **B**, and **C**.
- Name the type of joint in a mammalian body formed by;
  - bones **A** and **C**;
  - bones **B** and **C**.

**Solution**

- A** - Scapula or shoulder blade.
  - B** - Radius-ulna or lower arm bone or fore arm bone.
  - C** - Humerus or upper arm bone.
- I** - Glenoid cavity
  - II** - Metacronium process
  - III** - Olecranon process
  - IV** - Sigmoid notch
  - V** - Radius or radical bone
  - VI** - Ulna
  - VII** - Shaft
  - VIII** - Trochlea

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- c) A – shoulder  
B – lower arm or fore arm  
C – upper arm

d) **Bone A**

- It is triangular in shape.
- It has a broad blade.
- Presence of the glenoid cavity (into which the head of humerus fits) or metachromium process or coracoids process or acromium process or ridge flat surface.

**Bone B**

- It is made of two long bones or radius and ulna.

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- The ulna is slightly longer than the radius.
- Presence of the sigmoid notch (which articulates with the trochlea of the humerus) or olecranon process.

**Bone C**

- It is long bone.
- It has a rounded head (which fits into the glenoid cavity of the scapula).
- Presence of the trochlea (which fits into the sigmoid notch of the ulna) or (deltoid) ridge or shaft.

- e) i) Ball and socket joint  
ii) Hinge joint

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Good luck!