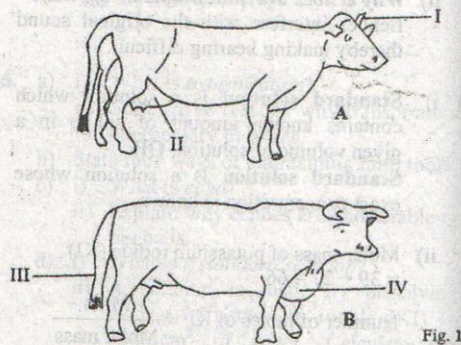


**WASSCE / WAEC Integrated Science May / June 2009 Past Questions
and Answers (Practical)**

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1. Figure 1 is an illustration of two breeds of cattle A and B.
Study the diagram carefully and answer the questions that follow.



- a) Name the parts labelled I, II, III and IV.
b) State **three** uses of the part labelled I to the animal.
c) State **three** differences in the body conformation between cattle breeds A and B.
d) Name the **major** product for which **each** breed is reared.
e) i) What is the **most** appropriate system of keeping cattle breed A?
ii) State **three** advantages of the system **named** in (e)(i) above.
f) i) Name **one** ectoparasite of cattle breeds A and B.
ii) State **two** ways of controlling the ectoparasite you have **named** in (f)(i).

Solution

- a) I - Horn
II - Udder
III - Tail
IV - Dewlap

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b) *Uses of horn*

- For offence or charging or defence or fighting or scaring.
- For scratching the body.
- For clearing path in the bush when moving.
- Assists some breeds to float when crossing a water body.

c)

<i>Cattle breed A</i>	<i>Cattle breed B</i>
Larger udder	Small udder
Long legs	Short legs
Long face	Short face
Curved or sloping back	Straight back
Triangular or wedge shape	Square or rectangular or blocky shape
Narrow at hind-quarters	Broad hind-quarters
Dewlap not prominent or small	Dewlap prominent or large

- d) Cattle breed A - Milk
Cattle breed B - Beef or meat

e) i) Intensive system

ii) *Advantages of intensive system*

- Cattle is protected from harsh and adverse weather environmental conditions or protected from thieves or loss or accident.
- Cattle are given balanced ration.
- High yield of cattle and good quality products are obtained.
- Proper keeping of records.
- Milking could be done at the right time.
- Sick cattle are easily detected and isolated thereby reducing the spread of diseases.
- There is no problem of animals going astray to destroy crops on farm and other properties.

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- Management and husbandry practices such as vaccination, deworming, mating can be done easily and also be regulated.
- Cattle are protected from pests, predators and diseases.

f) i) *Ectoparasite of cattle breeds A and B*

- Tick
- Lice
- Mites

ii) *Ways of controlling ticks or mites*

- Keep cattle in clean surroundings or environment.
- Regular dipping of animals to destroy ticks or spraying with appropriate or recommended chemical.
- Practise rotational grazing.
- Isolation of new stock to ensure that they are free from infection.
- Check cattle beddings regularly.
- Hand-pick ticks from the body of the host cattle.

Ways of controlling lice

- Keep cattle in clean surroundings or environment.
- Regular dipping of animals with acaricide solution to destroy the lice.
- Avoid overcrowding of cattle.

2. A moving body of mass 2.0 kg retards uniformly till it comes to rest. The velocities V_1, V_2, V_3, V_4 and V_5 are recorded against intervals of time $t = t_1, t_2, t_3, t_4$ and t_5 .

Figure 2(a) represents the velocities while Figure 2(b) represents the corresponding times.

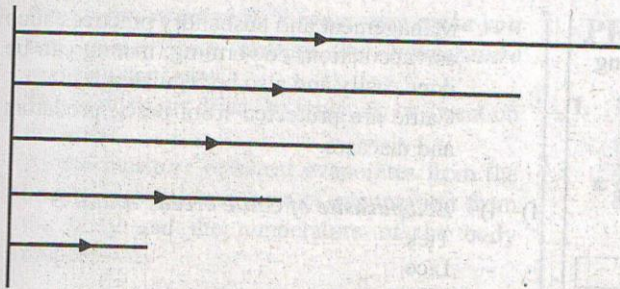


Fig. 2(a) showing velocities V_1, V_2, V_3, V_4 and V_5

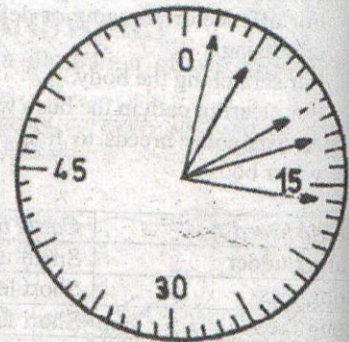


Fig. 2(b) Stop clock showing time, t in seconds

SCALE: 1 cm : 25 m

- a) i) Measure and record the raw velocities V_1, V_2, V_3, V_4 and V_5 and corresponding times $t = t_1, t_2, t_3, t_4$ and t_5 .
- ii) Convert the raw velocities recorded in (a)(i) to actual velocities using the scale provided.
- iii) Tabulate your results obtained in (a)(i) and (a)(ii) as shown below.

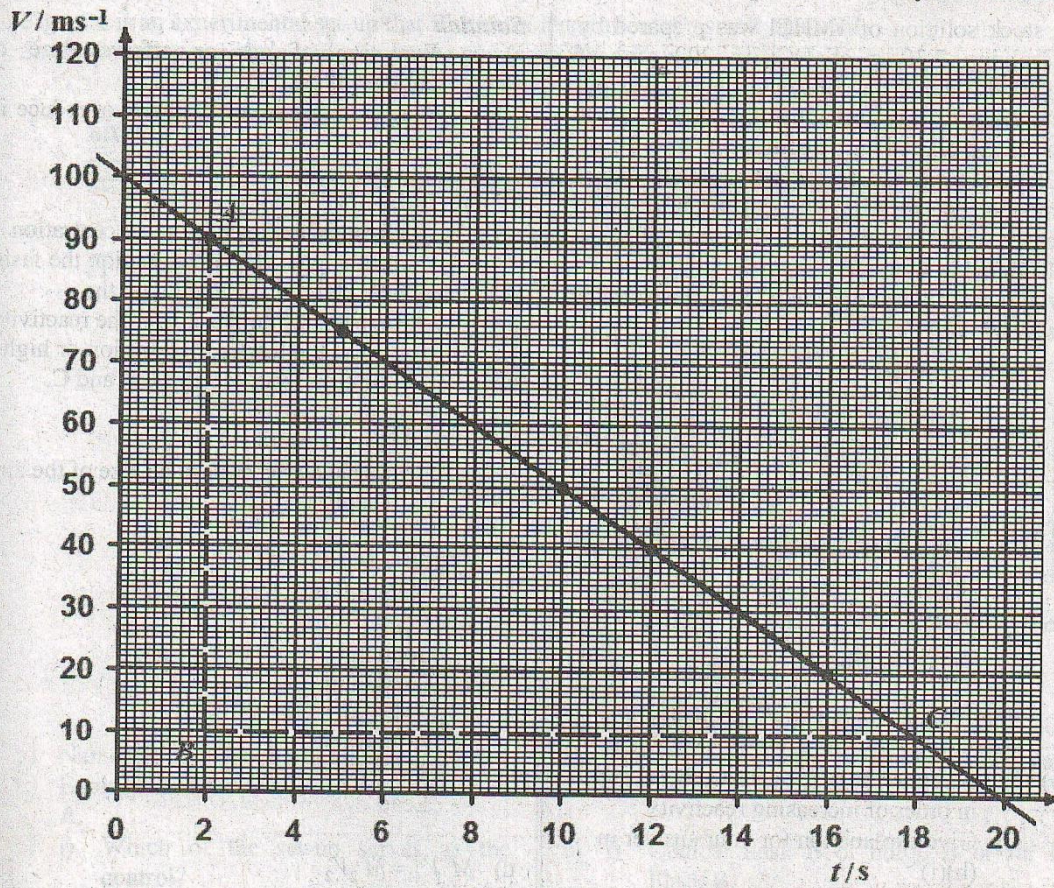
t/s					
Raw value of V/cm					
Actual value of V/ms^{-1}					

- b) Plot a graph with actual velocity V on the vertical axis and time t on the horizontal axis.
- c) Determine from the graph,
 - i) the initial velocity of the body.
 - ii) the time taken for the body to come to rest.
- d) i) Calculate the slope of the graph.
- ii) State the significant of the slope of the graph.

Solution

a)

t/s	$t_1 = 2$	$t_2 = 5$	$t_3 = 10$	$t_4 = 12$	$t_5 = 16$
Raw value of V/cm	9.0	7.5	5.0	4.0	2.0
Actual value of V/ms^{-1}	90.0	75.0	50.0	40.0	20.0



- c) i) The initial velocity of the body = 100 ms^{-1} .
 ii) The time taken for the body to come to rest = 20 s

- d) i) $\text{Slope} = \frac{BA}{BC} = \frac{(90 - 10) \text{ ms}^{-1}}{(2 - 18) \text{ s}} = \frac{80 \text{ ms}^{-1}}{-16 \text{ s}} = -5.0 \text{ ms}^{-2}$
 ii) The slope represents retardation

3. A stock solution of 1M HCl was prepared by dissolving 7.30 g of HCl in 200 cm³ of distilled water. 5 cm³ of stock solution was put into **each** of four test tubes labelled **C, D, E** and **F** and diluted with distilled water to 8 cm³, 13 cm³, 10 cm³ and 15 cm³ respectively. Equal amounts (*W* g) of zinc (Zn) granules were gently added to **each** of the test tubes as illustrated in figure 3.

Study the figure carefully and answer the questions that follow.

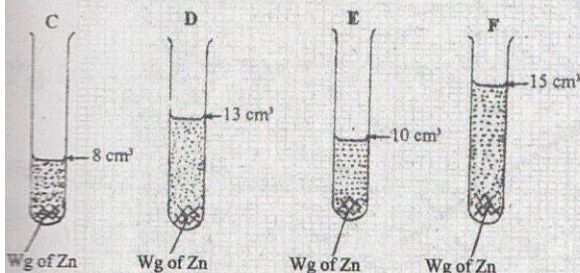


Fig. 3

- State what would be observed in this experiment.
- Arrange the test tubes **C, D, E** and **F** in order of increasing reactivity.
 - Give explanation for your answer in (b)(i).
 - State **three** other factors that could affect the rate of reaction in the test tubes illustrated above.
- Name **two** other metals that can be used in this experiment.
- Calculate the concentration of the solution in test tube **E** in g/dm³.

Solution

- Evolution of gas or effervescence or bubbles of gas.
 - Zinc granules diminish in size or reduce in size.
- F, D, E, C**
 - Reactivity depends on concentration
 - The higher the concentration the faster the reactivity or the lower the concentration the slower the reactivity.
 - F** has the least concentration or higher dilution followed by **D, E** and **C**.
 - Temperature
 - Surface area or particle size of the zinc
 - Catalyst
- Magnesium
 - Iron
 - Sodium
 - Potassium
 - Calcium
 - Aluminium
 - Tin
 - Lead

$$d) M_1 V_1 = M_2 V_2$$

$$5 \times 1 = 10 \times M_2$$

$$M_2 = 0.5$$

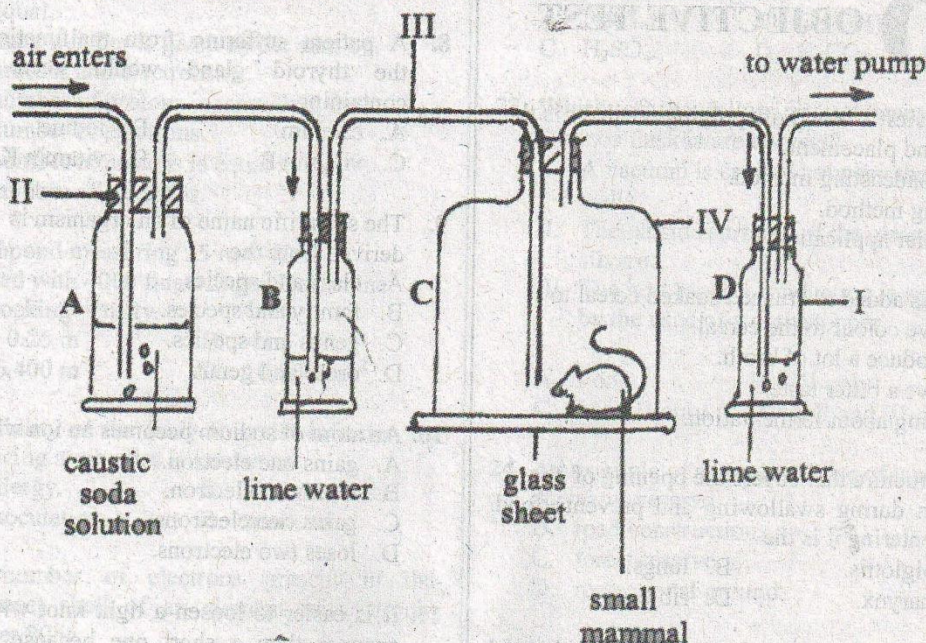
$$\text{Molarity} = \frac{\text{g/dm}^3}{\text{Molar mass}}$$

$$\text{Molar mass of HCl} = 1 + 35.5 = 36.5$$

$$0.5 = \frac{\text{g/dm}^3}{36.5}$$

$$\text{g/dm}^3 = 36.5 \times 0.5 = 18.25$$

4. Figure 4 is an experimental set-up that illustrates respiration of a small mammal. Study the set-up carefully and answer the questions that follow.



- Name the parts labelled I, II, III and IV.
 - Explain the role played by the solution in A.
 - Which of the set-up serves as the control?
 - Give **one** reason for your answer in (c)(i).
 - What happens to the lime water in D at the end of the experiment?
 - Give **one** reason for your answer in (d)(i).
 - State **one** precaution to be taken during the experiment.
 - Suggest an aim for the experiment.
- The solution absorbs carbon dioxide or carbon (IV) oxide
 - Conical flask B or bottle B or Jar B or Flask B.
 - To ensure that the air entering is free from carbon dioxide or carbon (IV) oxide.
 - The lime water turns milky or cloudy or chalky.
 - It is due to carbon dioxide or carbon (IV) oxide released by the animal.
 - Vaseline or grease is applied to the glass sheet or base of the bell jar and the corks to make it air-tight.
 - Experiment to show that carbon dioxide is released during respiration.

Solution

- I - bottle or jar
- II - Cork or rubber bung
- III - Delivery tube
- IV - Bell jar

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Good luck!