

INTEGRATED SCIENCE 2

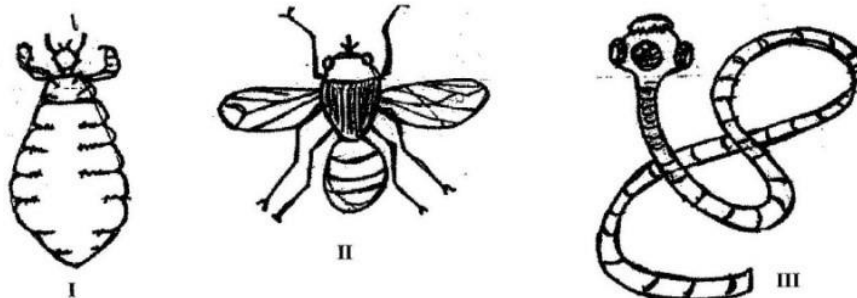
PART I

[40 marks]

Answer **all** of Question 1

1. (a) The diagrams below are illustrations of three different organisms harmful to farm animals

*Study the diagrams carefully and answer the questions that follow*



- Identify **each** of the organisms labelled **I**, **II** and **III** [3 marks]
- Which of the organisms is/are:

( $\alpha$ ) parasite(s)

( $\beta$ ) pest(s)

[3 marks]

- State **one** effect **each** of the following organism on farm animals

( $\alpha$ ) **I**;

( $\beta$ ) **II**;

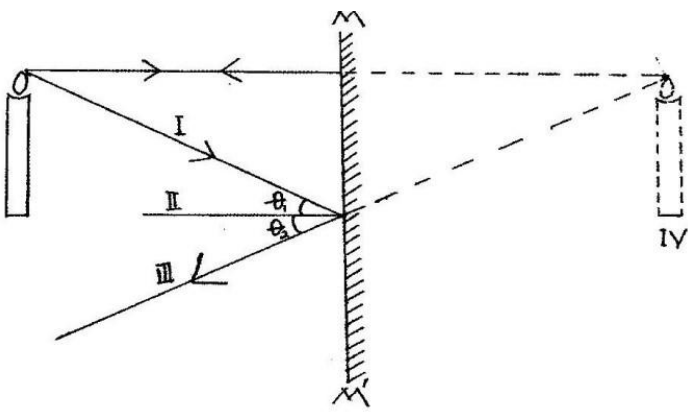
( $\gamma$ ) **III**.

[3 marks]

- State **three** methods of controlling the organism labelled **III** [3 marks]

(b) The diagram below illustrates a burning candle placed in front of a plane mirror MM' and an image of the candle formed in the mirror.

*Study the diagram carefully and answer the questions that follow*



- Name the parts labelled **I**, **II**, **III** and **IV** [4 marks]
- State the relationship between angles  $\theta_1$  and  $\theta_2$  [1 mark]
- Give **three** characteristics of **IV** in the diagram [3 marks]
- Explain why **IV** is represented in broken lines [2 marks]

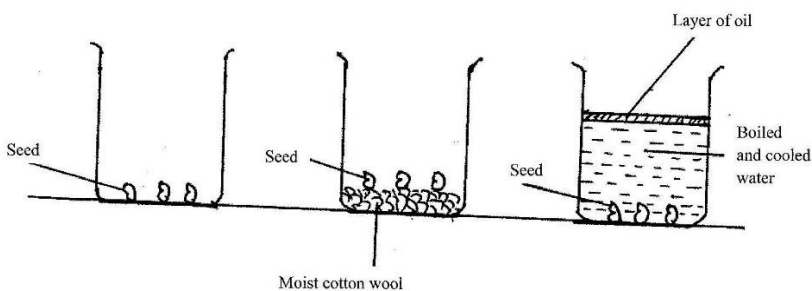
(c) In an experiment to investigate the reactivity of sodium, a piece of sodium metal was dropped in a beaker containing water. The experimental set-up is as illustrated below.

*Study the set-up carefully and answer the questions that follow*

- State what would happen if a glowing splint was held at the mouth of the beaker [2 marks]
- Name the gas evolved [1 mark]
- Write a balanced chemical equation for the reaction that occurred [3 marks]
- Name **two** other metals that can react in a similar ways as the sodium [2 marks]

(d) An experiment to investigate the conditions for germination of viable bean seeds was carried out. The diagrams below are illustrations of the different conditions in which the seeds were kept. The beakers labelled **A**, **B** and **C** containing the seeds were kept at room temperature.

*Study the diagrams carefully and answer the questions that follow*



- State what would happen to the seeds in **each** of the beakers labelled **A**, **B** and **C** when the experiment was observed after five days. [3 marks]
- Give reasons for **each** of your answers in (i) [4 marks]
- Why was oil spread on the surface of the water in the beaker labelled **C**? [2 marks]

## PART II

[60 marks]

Answer **four** questions **only** from this section

2. (a) (i) What is *weather*?

(ii) State **two** differences between *weather* and *season* [4 marks]

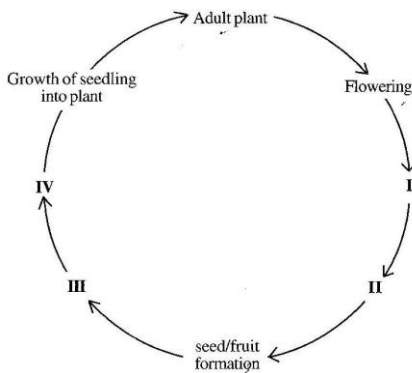
(b) State the composition of **each** of the following alloys;

(i) steel;

(ii) stainless steel [3 marks]

(c) List **four** benefits of vegetables to humans [4 marks]

(d) The diagram below is an illustration of life-cycle of a flowering plant.



Name **each** of the stages labelled **I, II, III** and **IV** [4 marks]

3. (a) Explain how

- lithium atom becomes **positively** charged
- oxygen atom becomes **negatively** charged [2 marks]

(b) (i) What is *potential energy*?

(ii) A coconut of mass 2 kg is on a tree 5 m tall. Determine the potential energy of the coconut at this height [Take  $g = 10 \text{ ms}^{-2}$ ] [5 marks]

(c) State **four** causes of teenage pregnancy [4 marks]

(c) State **four** uses of soil in agriculture. [4 marks]

4. (a) Give **four** health benefits of water to humans [4 marks]

(b) (i) State **two** ways in which crop rotation is important in crop production

(ii) Distinguish between *mixed cropping* and *mixed farming* [4 marks]

(c) (i) What is a *fuse*?

(ii) Name the colour code of the wire on which a fuse is placed in a three-pin plug [3 marks]

(d) (i) In a tabular form, state **three** differences between *osmosis* and *diffusion*

(ii) State **one** way in which osmosis is similar to diffusion [4 marks]

5. (a) (i) What is a *balanced* ration in animal nutrition?

(ii) State **two** benefits of balanced ration to poultry [4 marks]

(b) List **four** hazards that may be encountered in teaching and learning of science [4 marks]

(c) Name the parts of the circulatory system of humans [3 marks]

(d) (i) What is a *simple machine*?

(ii) State **two** methods of overcoming friction in everyday activities [4 marks]

6. (a) (i) What is a *magnetic field*?

(ii) To which class of mixture does **each** of the following belong?

(α) Smoke

(β) Air

(γ) Bronze

[5 marks]

(b) (i) What is *plaque* in human dentition?

(ii) State the function of chlorophyll in photosynthesis

[3 marks]

(c) Identify the scientific principle underlying the operation of **each** of the following industries

- kenkey production
- salt smoking
- fish smoking
- biogas production [4 marks]

(d) (i) What is *plant parasite*?

(ii) Give **one** example of a plant parasite

[3 marks]