

INTEGRATED SCIENCE 2

1. (a)

- Identify **each** of the organisms labelled **I, II and III** [3 marks]

1. – Louse
2. – Tsetse fly
3. – Tapeworm

- Which of the organisms is/are:

( $\alpha$ ) parasite(s) :Louse and tapeworm

( $\beta$ ) pest(s) : tsetsefly

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

( $\alpha$ ) **I:** Sucks blood of animals, resulting in anaemia

( $\beta$ ) **II:** Infects animals with sleeping sickness, which can lead to death

( $\gamma$ ) **III.** feeds on the digested food nutrients in the body of animal, which affects the immune system and leads to weakness and ill-health [3 marks]

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

- Deworming,
- regular checks by veterinary personnel
- Proper disposal of sewage
- clean grazing on low risk pasture

(b)

- Name the parts labelled **I, II, III and IV** [4 marks]

1. – Incident ray
2. – Normal

- – Reflected ray

1. – Image

- State the relationship between angles  $\theta_1$  and  $\theta_2$  [1 mark]

Angles  $\theta_1$  and  $\theta_2$  are equal

- Give **three** characteristics of **IV** in the diagram [3 marks]
- it is erect (upright)
- it is virtual
- It has the same size as the object
- Its distance to the mirror equals the distance of the object from the mirror
- It is formed behind the mirror

- Explain why **IV** is represented in broken lines [2 marks]

IV is represented in broken lines because it is a virtual (not a real) image (cannot be captured on a screen)

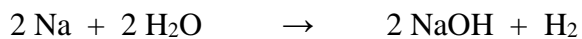
- (c) (i) State what would happen if a glowing splint was held at the mouth of the beaker [2 marks]

The glowing splint would be ignited (become aflame / catch fire)

- Name the gas evolved [1 mark]

Hydrogen

- 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]

Lithium, Potassium

(d)

- 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]

Beaker A – Seeds do not germinate

Beaker B – Seeds germinate

Beaker C – Seeds do not germinate

- Give reasons for **each** of your answers in (i) [4 marks]
  - Seeds in beaker A do not germinate because there is no water / moisture present
  - Seeds in beaker B germinate because all the conditions necessary for germination, namely, moisture, air, optimum temperature and viable seed are present.
  - Seeds in beaker C do not germinate because there is no air present (due to layer of oil on water surface)
- 
- Why was oil spread on the surface of the water in the beaker labelled **C**? [2 marks]

To prevent air (atmospheric oxygen) from getting dissolved in the water and reaching the seeds

## PART II

[60 marks]

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

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

The atmospheric condition of a place at a particular time.

or

The state of the atmosphere at a particular place and time

or

The condition of the atmosphere of a place over a short period of time

(ii) State **two** differences between *weather* and *season*

[4 marks]

WEATHER

SEASON

Atmospheric condition of a place over a short period of time

The average atmospheric condition of a place over a longer period of time within a year

Changes relatively quickly (lasts for a short time, usually about a day)

Changes relatively slowly (lasts for a longer time, usually 3 or more months)

It is less predictable

It is more predictable

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

(i) steel;

iron and carbon

(ii) stainless steel

[3 marks]

iron, carbon and chromium

(c) List **four** benefits of vegetables to humans

[4 marks]

Provide mineral salts, which supports metabolic activities for proper functioning of the body

Provide vitamins for protection against diseases

Provide dietary fibre for easy bowel movement

Provide antioxidants, which fights stress and strengthen immune system

Makes our food tastier / more enjoyable

(d) Name **each** of the stages labelled **I, II, III** and **IV**

[4 marks]

1. – Pollination

2. – Fertilization

• – Dispersion / dispersal

1. – Germination

3. (a) Explain how

○ lithium atom becomes **positively** charged

Lithium has 1 electron in its outermost shell, making it unstable. In order to become stable, it loses the electron on its outermost shell. As a result, the atom becomes positively charged, since there is now 1 more positive charge (proton) than negative charge (electron)

• oxygen atom becomes **negatively** charged [2 marks]

Oxygen has 6 electrons in its outermost shell, making it unstable. In order to become stable, it gains 2 more electrons on its outermost shell to make it completely filled. As a result, the negative charges (electrons) become 2 more than the positive charges (protons), making the atom negatively charged.

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

The energy possessed by a body as a result of its position or state.

(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]

Potential energy = mass(m)  $\times$  height(h)  $\times$  acceleration due to gravity(g)

$$= 2 \text{ kg} \times 5 \text{ m} \times 10 \text{ ms}^{-2}$$

$$= 100 \text{ kgm}^2 \text{ s}^{-2}$$

$$= 100 \text{ J}$$

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

- Indiscriminate / Casual sex
- Irresponsible parenting
- Lack of sex education in schools
- Illiteracy
- Negative peer pressure
- Lack of contraceptive use / rejection of family planning methods
- Wrong application of birth control measures
- Unemployment
- Poverty
- Streetism

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

- It serves as a support to agricultural crops
- It serves as a habitat (home) for several micro-organisms, which are important for plant growth.
- It holds water for the use of agricultural crops and animals.
- It contains mineral salts which are used by crops for healthy growth.
- It supports grass and other plants, which farm animals feed on for their sustenance
- It helps maintain suitable temperature for the development of plant roots and micro-organisms.

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

- It helps with easy bowel movement (Prevents constipation)
- It helps with the metabolic activities of the body
- It can relieve stress
- It can relieve headaches
- It promotes healthy and radiant skin
- It helps to maintain optimum blood pressure
- It helps to maintain suitable body temperature.
- It supports the proper functioning of the cells/ tissues/ organs of the body.

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

- It helps in maintaining soil fertility
- The legumes included in crop rotation fix atmospheric nitrogen in the soil,
- The growing of cover crops helps check soil erosion
- The system of rotation helps check pests and diseases
- There is a reduced risk of losing yield, in case of pest or disease attack.

(ii) Distinguish between *mixed cropping* and *mixed farming*

[4 marks]

Mixed cropping – Different types of crops are grown on the same piece of land

Mixed farming – Crops are grown and farm animals are reared at different sections of the same piece of land.

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

An electrical safety device containing a piece of a metal that melts if the current running through it exceeds a particular level, thereby breaking the circuit

**or**

a safety device consisting of a strip of wire that melts and breaks an electric circuit if the current exceeds a safe level

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

Red/ brown

[3 marks]

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

OSMOSIS	DIFFUSION
It involves the movement of only solvent or water molecules	It involves movement of solute molecules /particles
Semi-permeable membrane present	No semi-permeable membrane
Applies in only liquids (solvent molecules)	Applies in solids, liquids and gases
Movement of solvent molecules from lower to higher concentration	Movement of solute particles from a higher concentration to a lower concentration

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

- They both involve the movement of molecules
- The particles / molecules move to cause equality in the concentrations of the regions
- presence of a concentration gradient

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

The feed allowed for a given animal during a 24-hour period which contains all the essential nutrients to the animal in the right proportion and amount .

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

It ensures healthy and strong birds

It increase the quality of the eggs produced

It increases the quantity of eggs produced

It increases the rate of growth

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

- Corrosion of one's skin by corrosive chemicals
- Burns from open flame or explosives
- Injuries sustained from falling as a result of slippery floor
- Health risk from inhaling of poisonous gases
- Health risk from ingestion of toxic chemicals
- Skin irritation from contact with irritants
- Health risks from Electrical shocks
- Eye irritation from strong light or radiation or irritants

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

- Heart,
- blood
- Blood vessels (arteries, veins, capillaries )

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

A mechanical device that makes work easier and/ or faster

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

- Applying lubricants such as grease / oil
- Smoothing the contact surfaces
- Using wheels / rollers
- Using ball bearings

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

A region of space surrounding a magnet or current-carrying circuit in which the resulting magnetic force can be detected

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

(α) Smoke – solid-gas mixture

(β) Air – gas-gas mixture

(γ) Bronze – solid-solid mixture [5 marks]

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

A sticky, colorless deposit of bacteria that is constantly forming on the tooth surface

**OR**

A sticky, colorless film of bacteria that constantly forms on our teeth and along the gum line

(ii) State the function of chlorophyll in photosynthesis [3 marks]

It traps/absorbs sunlight, which provides energy for the manufacture of food

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

- kenkey production – fermentation
- salt making – evaporation
- fish smoking – food preservation
- biogas production – fermentation

[4 marks]



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

A plant that derives some or all of nutrients and water from another living organism

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

[3 marks]

dodder, mistletoe, the corpse flower, cactus mistletoe