

INTEGRATED SCIENCE 2

1. (a) (i) An electrical circuit

(ii) **The components:**

- D - Conductor wire
 E - Cell or emf source
 K - Switch or key
 P - Resistor

(iii) **Function of**

- D - Electric current flows through it
Or it conducts electricity
 E - Provides the electromotive force (emf)
 Or: provides the potential difference or voltage
 Or: produces the electric current or electricity
 Or: converts chemical energy to electrical energy
 K - Opens or closes the circuit
 Or: stops or starts the flow of current through the circuit
 P - Opposes the flow of current through the circuit
 Or: converts electrical energy to other forms

(iv) **energy transformation that occurs in E in the diagram when K**

Chemical energy → Electrical energy

(b) (i)

<i>Test substances</i>	<i>Observations</i>		<i>Conclusion</i>
	<i>Red litmus paper</i>	<i>Blue litmus paper</i>	
Lemon juice	Remains red or : no colour change	Turns red	Acidic substance or : Contains acid
Calcium hydroxide solution	Turns blue	Remains blue or : no colour change	Basic substance or : Contains base
Dilute hydrochloric acid	Remains red or : no colour change	Turns red	Acidic substance Contains acid

(ii) **Reactants to form salt and water:**

Calcium hydroxide solution and dilute hydrochloric acid

(iii) **Balanced chemical equation:**



(c) (i) **The parts:**

- I - salivary gland
- II - oesophagus
- III - stomach
- IV - liver **or:** gullet

(ii) Function of:

Part V - Stores bile **Or:** Concentrates bile

Part VI - Secretes juices containing enzymes into the small intestines
Or: secretes hormones such as insulin into the bloodstream

(iii) Digestion of protein starts at: Part III or The stomach

(iv) (α) absorption of end-products - Part VII - Small intestines

(β) re-absorption of water - Part VIII - Large intestines

(γ) egestion - Part X - Anus

(d) (i) The Tool - Secateurs or a pair of secateurs

(ii) Uses of the tool

- § Trimming
- § Cutting
- § Pruning

(iii) Ways of maintaining the tool

- § Oiling or greasing metal parts
- § Washing and drying after use
- § Tightening bolts and nuts when loose
- § Sharpening cutting edges when blunt (any three)

2. (a) (i) Neutralization reaction

A chemical reaction between an acid and a base to produce salt and water

(ii) (α) Sodium metal and dilute hydrochloric acid.

$$2 \text{Na} + 2 \text{HCl} \rightarrow 2 \text{NaCl} + \text{H}_2$$

(β) Sodium hydroxide and dilute hydrochloric acid

$$\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$$

(b) Weaning

Starting to feed a young animal with food other than its mother's milk

(c) (i) Milky way

the spiral galaxy to which Earth and its solar system belong

(ii) Use of artificial satellites

- § Weather studies and forecasting
- § Telecommunication
- § Sending and receiving TV signals
- § Taking photographs from space for various purposes
- § Internet networking
- § Global Positioning System (GPS) - a worldwide navigation system
[any one of the above]

(d) (i) Habitat

The natural living place of a plant or animal

Or: The natural conditions and environment of an organism

(ii) Examples of habitat

Forest, desert, river or wetlands, tree, etc (any two)

3. (a) (i) Pressure

The force per unit area

Or: Pressure = force / area

(ii) When a knife is sharpened, the area at the cutting edge is reduced; hence greater pressure is attained at a given applied force. Therefore it cuts easily with less applied force.

(b) (i)

METALS	NON-METALS
High melting point	Low melting point
Shiny surface	Dull surface
Malleable	Not malleable
Ductile	Not ductile
Good conductors of heat	Bad conductors of heat
Good conductors of electricity	Bad conductors of electricity

(ii) Alloy

A substance containing a metal and another metal or non-metal uniformly physically combined

Or: A homogeneous mixture of a metal and another metal or non-metal

(iii) (α) Steel - Iron and Carbon

(β) brass - Zinc and copper

(c) Conditions suitable for rearing tilapia in a fishpond

- § Suitable salinity (salt concentration) of the pond
- § Non-polluted water
- § Favourable temperature of water
- § Sufficient dissolved oxygen in the water
- § Suitable pH of the water

(d) Importance of the streamlined body of a bony fish

Enables the fish to move smoothly or easily in the water

Or: it reduces the friction between the water molecules and the body of the fish.

4. (a) (i) Disease Vector

An organism that transmits disease-causing microorganisms from an infected person or animal to another

(ii) Methods of control

(α) ectoparasites

- § Use of pesticides
- § Dipping
- § Dusting
- § Handpicking
- § Use of footbath
- § Rotational grazing

(β) endoparasites

- § Drenching
- § Deworming
- § Vaccination
- § Regular change of feed and litter

(b) (i) Symptoms of nitrogen deficiency in a tomato plant

- § Stunted growth
- § Weak stem or branches
- § Leaves turn yellowish
- § Fruits are smaller and fewer than normal

(ii) Side dressing (fertilizer application)

Applying the fertilizer on / in the ground at the sides of the crop

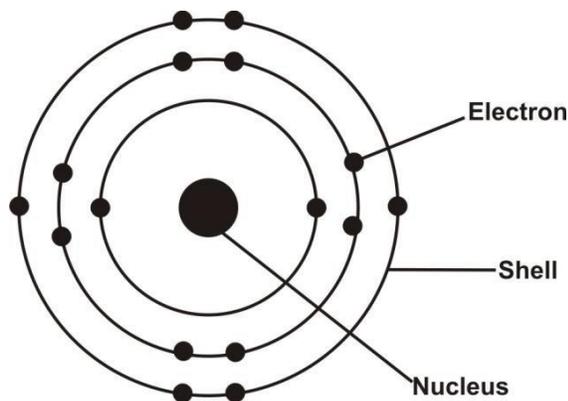
(c) (i) Power

The time rate of doing work **Or:** The work done per unit time

Or: (work done) / (time taken)

(ii) S.I. unit of power = watt or W

(d) The electronic structure of sulphur (atomic no. 16)



5. (a) (i) **Respiration**

The breakdown of food substances in an organism to release energy, carbon dioxide, water

(ii) **Types of respiration**

External respiration and internal respiration

Or: Aerobic and anaerobic respiration

(b) **Ways of maintaining soil fertility**

- § Crop rotation
- § composting
- § mulching
- § Fertilizer application
- § Bush fallowing
- § Green manuring
- § Planting of cover crops
- § Mixed farming

(c) (i) **Systematic names of:**

- (α) FeS - Iron (II) sulphide
- (β) SO₂ - Sulphur (IV) oxide
- (γ) CO₂ - Carbon (IV) oxide

(ii) **Reasons**

They are very malleable, ductile, have high lustre and less reactive.

(d) (i) **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.

(ii) **Why fuse is used in an electrical circuit**

To protect the electrical circuit from damage caused by abnormal power surges or increases

6. (a) (i)

Unicellular organism	Multicellular organism
organism is made up of only one cell	organism is made up of more than one cell

(ii) **Why vegetable crops are important to humans**

- § Good source of vitamins
- § Good source of mineral salts
- § Make food tasty
- § They have high fibre content

(b) (i) **Elements of climate**

- § Rain
- § Temperature
- § Humidity
- § Sunshine
- § Atmospheric pressure
- § Cloud
- § Wind

(ii) **Difference**

Climate	Weather
atmospheric condition of a place over a long period of time	atmospheric condition of a place over a short period of time

(c) **Advantages of *staking* in crop production**

- § Keeps fruits clean
- § Enables easy weeding
- § Enables easy harvesting
- § Prevents early spoilage of fruits
- § Keeps plant from falling during storms
- § Keeps plant from falling under the weight of mature fruits

(d) (i) **Corrosion explanation**

A process by which a substance, especially a metal, is destroyed progressively by chemical action.

Example: the rusting of iron

(ii) Sublimation explanation

A process in which a substance is converted directly from a solid to a gas or from a gas to a solid without passing through the liquid state

Example: the conversion of naphthalene ball (camphor) from solid to gas directly