

INTEGRATED SCIENCE 2
SOLUTIONS
ESSAY

1. (a) (i) Light rays from the lighted bulb
(ii) Sees no light or a portion of cardboard B
(iii) Since light moves in a straight line, the observer sees the light only when the holes are in a straight line with the light source. Since light rays cannot bend around the cardboard B when slightly displaced, the observer does not see the light
(iv) The observer would see the light rays from the lighted bulb again.
(v) The property that light travels in a straight line or rectilinear propagation of light
- (vi) (α)
Eclipse of the sun (solar eclipse)
Eclipse of the moon (lunar eclipse)
Day and night
Shadow **[any two]**
(β) camera, microscope, telescope, binoculars, periscope, torch, **[any one]**
(b) (i) A – highly inflammable or flammable
B – Irritant or can cause harm
C – Poisonous or toxic or deadly
D – Danger ahead
(ii) A – liquefied petroleum gas (LPG), petrol, kerosene, spirit, ethanol **[any one]**
B – Concentrated Hydrochloric acid [Conc. HCl], concentrated sulphuric acid [conc. H₂SO₄], concentrated magnesium hydroxide [Mg(OH)₂], concentrated sodium hydroxide [NaOH] **[any one]**
C – Dichlorodiphenyltrichloroethane (DDT) [C₁₄H₉Cl₅], Potassium cyanide [KCN], Sodium cyanide [NaCN], mercury **[any one]**
(iii) On roads, at construction sites, very high voltage plants/devices, **[any one]**
(iv) – They help prevent accidents by making people take precautions.
– They serve as warnings to prevent injuries or death.
- (c) (i) A – incisor
B – premolar / molar
C – canine
(ii) A – chisel shaped
B – almost flat surface with small projections / cusps / ridges
C – pointed
(iii) A – Biting or cutting
B – chewing or grinding or mashing
C – tearing
(iv) I – enamel / crown
II – root
- (d) (i) A – Garden fork
B – Spade
C – hand trowel
D – hand fork
E – watering can
(ii) A – Breaking up soil or making soil loose or ploughing soil or turning over soil
B – Collecting soil or mixing substance such as animal feed or digging ground or making surface of ground level
C – earthing up crops or transplanting seedlings or spreading fertilizer or manuring or mounding certain

crops

D – Breaking up soil or making soil loose or ploughing soil or turning over soil

E – Watering soil / crops

2. (a) (i) Ruminants are cud-chewing hoofed mammals with multiple-chambered stomach.

(ii) Examples: camel, goat, sheep, giraffe, cow

(b) (i) A force is a push or pull exerted on a body.

Or:

A physical influence that tends to change the position or shape of an object with mass

(ii) Effects of forces on a body:

Can cause a moving body to come to rest (stop moving)

Can cause a body at rest to move

Can cause a moving body to accelerate

Can cause a moving body to decelerate

Can change the direction of a moving body

Can change the shape of a body [any two]

(c) (i) Ways of maintaining the carbon cycle:

Afforestation (planting new trees to replace the ones that have been destroyed or cut down)

Photosynthesis

Respiration

Reducing the amount of carbon dioxide emissions from industries

Avoiding excessive bush burning

Reducing the amount of fumes from vehicles [any two]

(ii) Environmental effects

Global warming as a result of the depletion of the ozone layer

Increase in volume of sea water due to melting of icebergs

Greenhouse effect [any one]

(d) (i) Protons, neutrons and electrons

(ii) PARTICLE RELATIVE CHARGE

Proton positive (+1)

Neutron no charge or neutral (0)

Electron negative (– 1)

(iii) cation

3. (a) (i) A mixture is

A physical combination of two or more substances

Or:

A substance consisting of two or more substances that have been combined physically

(ii) Why some mixtures are thoroughly stirred before they are used:

To attain a uniform mixture or to make it homogenous, since the original mixture may not be uniform or there may be some suspended particles of the solute

(b) (i) Reflection of light is

The bouncing back or redirection of light when it strikes a surface

(ii) Characteristics of images formed by plane mirrors:

♣ Same size as object

♣ Same distance from mirror as object

♣ Virtual

- ♣ Erect / upright
- ♣ Laterally inverted [**any two**]

(c) (i) A fertilizer is:

Any substance usually added to or spread onto soil to increase its ability to support plant growth

Or: A substance added to soil to increase its nutrient content or fertility

(ii) Examples of inorganic fertilizer:

NPK or ammonium sulphate or urea or potassium chloride (or muriate of potash)

(d) (i) Indiscriminate sex

Having sexual intercourse with multiple (two or more) partners and usually without protection (use of condom)

(ii) Dangers of indiscriminate sex

- ♣ Contracting sexually transmitted diseases (STDs), such as AIDS, syphilis, etc
- ♣ Teenage pregnancy (where teenagers are involved)
- ♣ Abortion, which is usually quite dangerous to the mother
- ♣ Loss of social respect / reputation
- ♣ Loss of self-esteem [**any two**]

4. (a) (i) A simple machine

A mechanical device that makes work easier and/ or faster

(ii) Examples of simple machines

Bottle opener, wheel barrow, nut cracker, inclined plane, spanner, crowbar, etc

(b) (i) Rusting is

the corrosion (wearing away) of the surface of iron or steel due to the formation of iron oxide

or: the formation of a reddish brown coating of iron oxide on the surface of iron or steel that forms when the metal is exposed to air and moisture

(ii) Effects of rusting:

Shortage of life span of item

Loss of beauty of item

Reduction in effectiveness of implement

Collapse of buildings [**any two**]

(c) (i) Food nutrients

Chemical substances, found in food, that the body needs in order to function properly

(ii) CARBOHYDRATE

Bread

Maize

FATS AND OILS

palm fruits

margarine

PROTEIN

beans

meat

(d) (i) Effects of malnutrition in farm animals

- ♣ Deficiency diseases
- ♣ Stunted growth
- ♣ Low energy and activity (lack of vitality)
- ♣ Slow recovery from illnesses
- ♣ Death
- ♣ Lower reproduction [**any two**]

(ii) Disease caused by virus

- ♣ Rabies
- ♣ Bird flu
- ♣ Newcastle
- ♣ Rinder pest [any one]

5. (a) (i) Soil erosion:

The washing away of the top soil by agents of erosion

Or: The removal of soil material by natural processes, principally running water, glaciers, waves, and wind

(ii) Methods of controlling soil erosion:

Planting of cover crops

Planting of grasses

Planting of wind brakes (trees)

Ploughing across slopes

Terracing

Strip cropping [any two]

(b) (i) (α) Adaptation:

The development of physical and behavioral characteristics that allow organisms to survive and reproduce in their habitats

(β) Endangered species

Species threatened by extinction:

Or: Species whose numbers are so few, or are declining so quickly, that the animal, plant, or other organism may soon become extinct

(c) (i) Example of hard water

Deep well water

Borehole water

(ii) It is advisable to drink hard water because

it contains dissolved mineral salts, such as calcium and magnesium salts, which are necessary to maintain good health and proper functioning of the body.

NB: (Minerals are essential for the healthy growth of teeth and bones. They also help in cellular activities, such as enzyme action, muscle contraction, nerve reaction, and blood clotting)

(d) (i) Magnetic field:

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

(ii) Methods of making magnets

♣ Electrical method

♣ Single stroking

♣ Double stroking

♣ Induction

♣ Hammering [any two]

6. (a) (i)

(α) Solvent:

A substance that dissolves things:

Or: A substance in which other substances are dissolved, usually a liquid

(β) Solute

A substance that is dissolved in another substance

(ii) Common solvent used in home

Water, Turpentine, liquid soap, alcohol, kerosene [any one]

(b) (i) Ration:

A fixed and limited amount of feed, given to an animal or group of animals at specific times / intervals.

This is done to ensure that the animal has the right amounts of essential food nutrients for healthy growth and development.

(ii) Dehorning:

Removing or preventing the growth of the horns of an animal by surgery or cauterization.

This is done primarily to prevent animals from using them to injure other animals or destroy property

(c) (i) Element:

A substance that is made up of the same kind of atoms

Or:

Any substance that cannot be broken down into a simpler one by a chemical reaction

(ii) (α) Potassium – K

(β) Sulphur – S

(d) (i) Mixed farming:

The cultivation of crops and the rearing of livestock on the same farm at the same time

Or: farming that combines growing crops and rearing livestock on the same farm at the same time

(ii) Mixed cropping

The cultivation of different kinds of crops on the same piece of land at the same time