

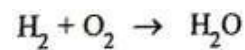
JUNE 2022

Answer **all** the questions

1. An example of a storage pest is

- A. yam beetle
- B. capsid
- C. armyworm
- D. weevil

2. The number required to make the following chemical equation balanced is:



- A. 1/2
- B. 1
- C. 1/3
- D. 3

3. Which of the following bodies are **natural** sources of light?

- I. Moon
 - II. Sun
 - III. Glowworm
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

4. An atom ${}_{11}^{23}\text{X}$ forms bond by losing one electron, the charge on the ion formed is

- A. -1
- B. -2
- C. +1
- D. +2

5. The practice of growing cowpea and maize on a piece of land at the same time is known as

- A. mixed farming

- B. mixed cropping
 - C. land rotation
 - D. crop rotation
6. The periodic table is an arrangement of elements according to increasing
- A. atomic number
 - B. mass number
 - C. nucleon number
 - D. neutron number
7. Which of the following substances is a compound?
- A. Copper
 - B. Diamond
 - C. Sucrose
 - D. Sulphur
8. *Soil texture* is a term used to describe the
- A. amount of water soil can hold
 - B. arrangement of soil particles in a given soil
 - C. proportion of sand, silt and clay in a sample of soil
 - D. mixture of all soil particles
9. Which of the following statements about clayey soil is **not** true? It
- A. swells when dry and shrinks when wet
 - B. has high water retention
 - C. is difficult to plough when dry
 - D. is compact when dry
10. Urea is a good source of
- A. phosphorus in the soil
 - B. calcium in the soil
 - C. sodium in the soil
 - D. nitrogen in the soil
11. The energy transformation that takes place in a solar cell is
- A. light to chemical
 - B. light to electrical
 - C. electrical to heat
 - D. electrical to light
12. Digestion of protein begins in the stomach and ends in the
- A. large intestine
 - B. small intestine
 - C. appendix
 - D. caecum

13. A capacitor is connected in a series circuit with LED, a battery and a switch. When the circuit is closed, the LED
- comes on and stays on
 - flashes and goes off
 - does not come on
 - flashes and stays on
14. The hard outer surface of a tooth is called
- root
 - dentine
 - cement
 - enamel
15. When gases are heated they
- melt
 - sublime
 - decrease in volume
 - decrease in intermolecular forces
16. Which of the following processes is an example of a physical change?
- Fermentation of food
 - Respiration
 - Magnetization of iron
 - Lighting a match
17. A mixture of alcohol and water can best be separated by
- filtration
 - condensation
 - distillation
 - evaporation
18. The ion that causes hardness in water is A.
- CO_3^{2-}
 - Mg^{2+}
 - Na^+
 - OH^-
19. Soil depletion is not caused by
- erosion
 - afforestation
 - leaching
 - illegal mining

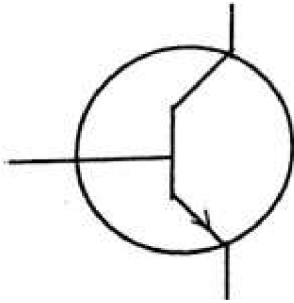
20. Which of the following planets are closer to the sun than the Earth?
- A. Venus and Mars
 - B. Venus and Mercury
 - C. Mercury and Mars
 - D. Venus and Saturn
21. Which of the following statements about pressure in liquids is/are **correct**?
- I. Pressure in liquids at the same level acts equally in all directions.
 - II. Pressure in liquids depend on the area of the liquid.
 - III. Pressure in liquids decreases with depth.
- A. I only
 - B. II only
 - C. I and III only
 - D. I, II and III
22. The ovary, style and stigma are collectively known as the
- A. stamen
 - B. pistil
 - C. fruit
 - D. stem
23. A lunar eclipse may occur when the
- A. moon is between the earth and the sun
 - B. sun is between the earth and the moon
 - C. earth is between the sun and the moon
 - D. moon is positioned far away from the earth
24. Which of the following statements are reasons for conserving energy?
- I. Insufficient production of energy
 - II. Increasing demand of energy
 - III. Limiting production of carbon (IV) oxide
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III
25. All flowering plants end their life cycle with
- A. seed formation
 - B. seed development
 - C. seed dispersal
 - D. seed germination

26. The solid component found on the filter paper and the liquid component that flows into a container during filtration are respectively called
- A. filtrate and residue
 - B. condensate and residue
 - C. residue and filtrate
 - D. residue and condensate
27. Rainfall is as a result of
- A. low pressure
 - B. strong wind
 - C. cold wind
 - D. low humidity
28. Which of the following characteristics is/are of the image formed in a pinhole camera?
The image is
- I. inverted
 - II. virtual
 - III. diminished
- A. I only
 - B. II and III only
 - C. I and III only
 - D. I, II and III
29. What force makes a ripe mango to fall from a tree?
- A. Force of tension
 - B. Magnetic force
 - C. Electrostatic force
 - D. Gravitational force
30. The **main** reason for staking tomato is to ensure
- A. bigger fruit development
 - B. air circulation on the farm
 - C. upright growth of the plant
 - D. that fruits do not get rotten
31. People who travel in space are called
- A. geologists
 - B. astronauts
 - C. space shuttlers
 - D. astronomist
32. Green plants have the ability to make their own food hence they are known as
- A. producers
 - B. parasites
 - C. consumers

- D. decomposers
33. An example of a first class lever is
- A. bottle opener
 - B. crow bar
 - C. wheel barrow
 - D. fishing rod
34. The shoot system of a flowering plant develops from the
- A. radicle
 - B. plumule
 - C. cotyledon
 - D. endosperm
35. A force meter measures
- A. mass
 - B. temperature
 - C. weight
 - D. work
36. Which of the following substances are matter?
- I. Hydrogen
 - II. Air
 - III. Stone
- \
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III
37. The floor of a room has length 20 m and breadth 15 m. Determine the area of the floor.
- A. 35 m^2
 - B. 200 m^2
 - C. 250 m^2
 - D. 300 m^2
38. It is **not** advisable to use old electrical gadgets because they
- A. are not efficient
 - B. are dangerous
 - C. produce sparks
 - D. waste energy
39. Which of the following instruments can be used to measure the diameter of a circle?
- A. A metre-rule
 - B. A thermometer

- C. An ammeter
- D. A string

40. The diagram below is an illustration of a transistor.



The arrow shows the direction of :

- A. electron movement
- B. hole movement
- C. electron and hole movement
- D. negative charge movement

ANSWERS

- | | | | |
|------------|----|------------|----|
| 1. | D. | 26. | C. |
| 2. | A | 27. | A. |
| | . | 28. | C. |
| 3. | D | 29. | D. |
| | . | 30. | C. |
| 4. | C. | 31. | B. |
| 5. | B | 32. | A. |
| | . | 33. | B. |
| 6. | A | 34. | B. |
| | . | 35. | C. |
| 7. | C | 36. | D. |
| | . | | |
| 8. | C | | |
| | . | | |
| 9. | A | | |
| | . | | |
| 10. | D | | |
| | . | | |
| 11. | B | | |
| | . | | |
| 12. | B | | |
| | . | | |
| 13. | A | | |
| | . | | |
| 14. | D | | |
| | . | | |
| 15. | D | | |
| | . | | |
| 16. | C. | | |
| 17. | C. | | |
| 18. | B | | |
| | . | | |
| 19. | B | | |
| | . | | |
| 20. | B | | |
| | . | | |
| 21. | A | | |
| | . | | |
| 22. | B. | | |
| 23. | C | | |
| | . | | |
| 24. | D | | |
| | . | | |
| 25. | A | | |

weevil	oportion of sand, silt and clay in a sample
1	of soil swells when dry and shrinks when
2	wet
I, II and III	nitrogen in the
+1	soil light to
m	electrical
i	small intestine
x	comes on and stays
e	on enamel
d	decrease in intermolecular
c	forces Magnetization of iron
r	distillation
o	Mgz+
p	afforestation
p	Venus and
i	Mercury I only
n	pistil
g	earth is between the sun and
a	the moon I, II and III
t	seed
o	formation
m	residue and
i	filtrate low
c	pressure
n	I and III only
u	Gravitational
m	force
b	upright growth of the
e	plant astronauts
r	producers
S	crow bar
u	plumule
c	weight
r	I, II and III

S
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- 37. D. 300m²
- 38. D. waste energy
- 39. A. A metre-rule
- 40. B. hole movement

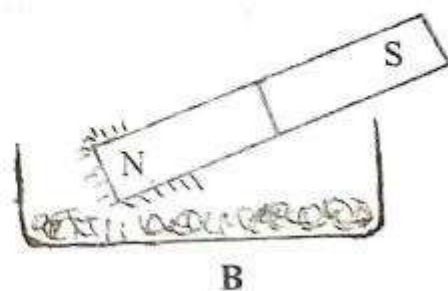
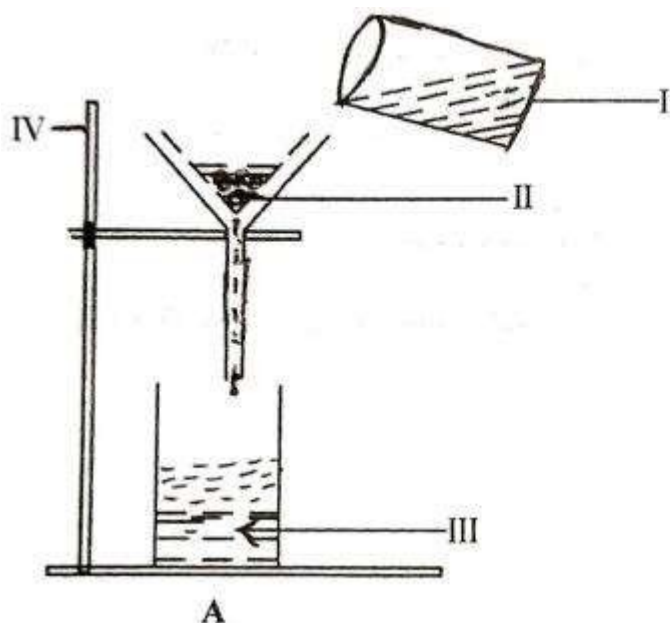
This paper is in **two** sections: **A** and **B**. Answer Question 1 in section **A** and any other **four** questions in section **B**

Credit will be given for clarity of expression and orderly presentation of material.

SECTION A
[40 marks]

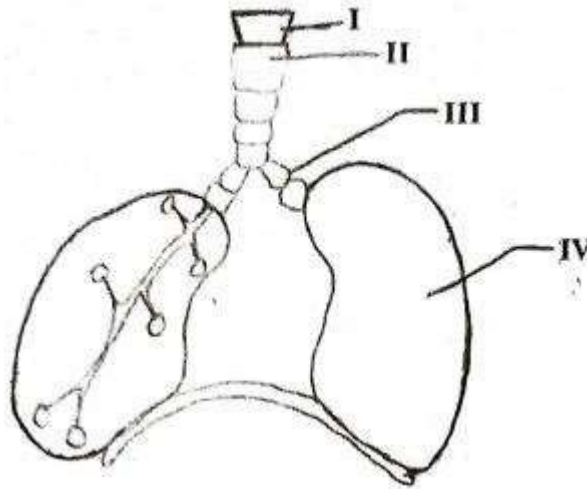
Answer **all** of Question 1

1. (a) The diagrams below are illustrations of an experimental set-up.
Study the diagrams carefully and answer the questions that follow.



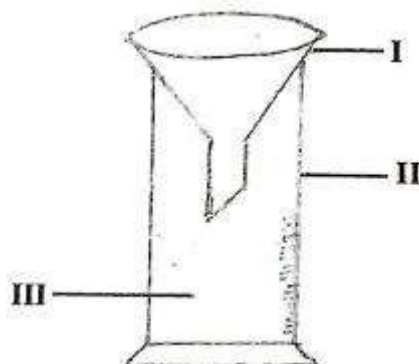
- (i) Identify **each** of the parts labelled I, II and **III**. [3 marks]
- (ii) Name the method of separation in **each** of the set-up:
- (a) **A**;
- () **B**. [2 marks]
- (iii) State the class of mixtures that the experimental set-up A [1 mark]
- (iv) could be used for. Give a reason for the answer stated in [2 marks]
- (v) (iii). [1 mark]
- (vi) Name **one** possible component of the mixture in set-up B. [1 mark]
- State the function of the part labelled **IV**.

- (b) The diagram below is an illustration of a part of a system in human.
Study the diagram carefully and answer the questions that follow.



- | | | |
|-------|--|-----------|
| (i) | Name the system illustrated. | [1 mark] |
| (ii) | Name each of the parts labelled I, II, III and IV . | [4 marks] |
| (iii) | What is the role of the part labelled I . | [1 mark] |
| (iv) | Name three diseases that affects the system illustrated. | [3 marks] |

- (c) The diagram below is an illustration of an experimental set-up used to measure an ecological factor.
Study the diagram carefully and answer the questions that follow.

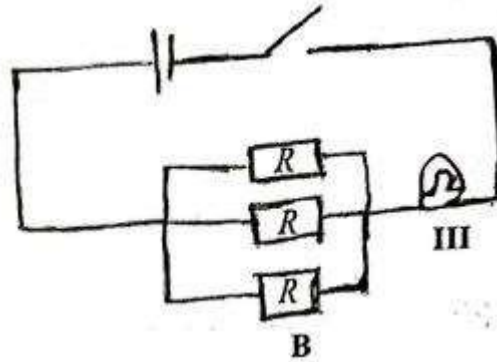
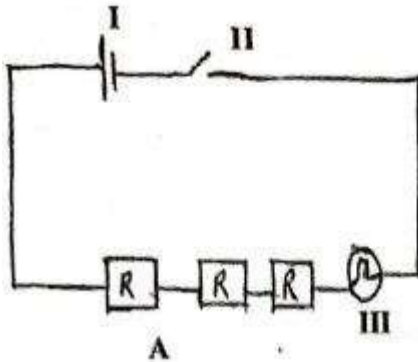


- | | | |
|-------|--|-----------|
| (i) | Identify the apparatus illustrated. | [1 mark] |
| (ii) | Name each of the parts labelled I, II and III | [3 marks] |
| (iii) | Give one use each of the parts labelled I and II . | [2 marks] |
| (iv) | What ecological factor was measured? | [1 mark] |
| (v) | State three ways in which the ecological factor measured in (iv) is | |

- important in agricultural soils. [3 marks]
- (vi) Name **one** farm tool that aids the ecological factor measured in (iv) to perform its function in agricultural soils. [1 mark]

- (vii) Describe how the farm tool named in (vi) is used to aid the factor measured in the experiment. [2 marks]

- (d) The diagrams below are illustrations of electrical circuits. Study the diagrams carefully and answer the questions that follow.



- (i) Identify **each** of the components labelled I, II and **III**. [3 marks]
- (ii) State the type of arrangement of resistors (R) in **B**. [1 mark]
- (iii) State the effect of the arrangement of resistors in **each** of the diagrams **A** and **B** on **III**. [2 marks]
- (iv) Give a reason for **each** of the answers stated in (iii). [2 marks]

SECTION B

[60 marks]

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

2. (a) State **three** differences between *metals* and *non-metals* in terms of their physical properties. [3 marks]
- (b) (i) Explain the term *active* region as applied to transistors;
 (ii) State what happens in the active region of a transistor. [3 marks]
- (c) (i) State **two** effects of lack of protein in the diet of humans
 (ii) Describe **briefly** the chemical test for glucose. [5 marks]
- (d) (i) What are *soil resources*?
 (ii) State **two** agricultural activities which make the soil lose its nutrients.

[4 marks]

3. (a) List in the **correct** order, the organs through which food passed from the mouth to the anus.

[2 marks]

(b) State the components of a balanced ration for feeding poultry. [4 marks]

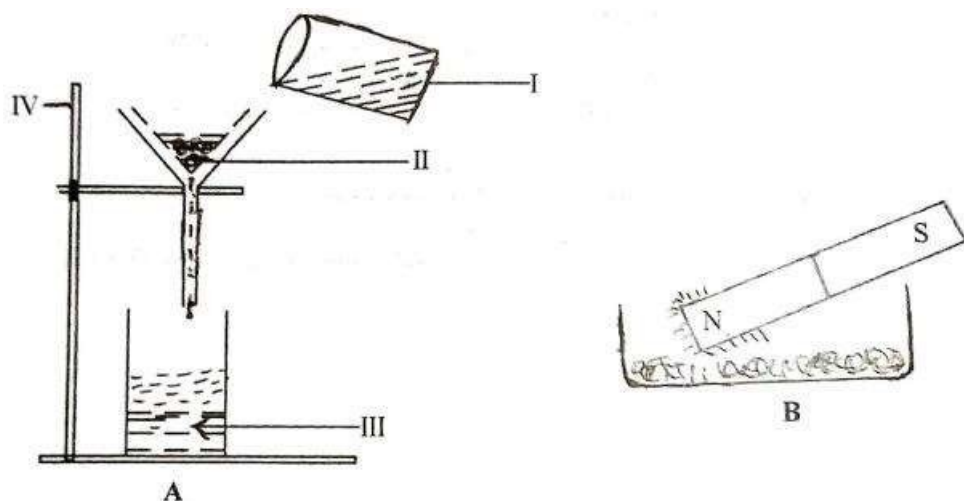
- (c) Predict the products formed when:
- magnesium solution reacts with dilute hydrochloric acid;
 - potassium reacts with water. [4 marks]
- (d) (i) State **two** effects of heat on a substance.
- (ii) Potassium permanganate crystals are dropped into a beaker of water and warmed:
- State what would be observed;
 - State the phenomenon demonstrated in (a) [5 marks]
4. (a) (i) Name the stages in the life cycle of a mosquito.
- (ii) Name the stage at which feeding **does not** take place. [5 marks]
- (b) Explain **briefly** why air is regarded as a mixture. [2 marks]
- (c) (i) What is a magnetic pole?
- (ii) State **two** uses of temporary magnets. [4 marks]
- (d) Give **four** reasons for planting crops in rows. [4 marks]
5. (a) (i) Name **two** elements which make the teeth of mammals strong.
- (ii) Name **two** common diseases of the human teeth. [4 marks]
- (b) State **three** reasons why sandy soil **cannot** support effective plant growth. [3 marks]
- (c) An atom has 13 protons and 14 neutrons:
- Draw and label the structure of the atom. [4 marks]
 - State its valency.
- (d) (i) State **three** ways in which fluid pressure is applied in everyday activities. [4 marks]
- (ii) State **one** substance that is an insulator.
6. (a) Explain the term *mixed cropping*. [2 marks]
- (b) (i) What is an *alloy*?
- (ii) Name the constituent elements in brass. [3 marks]
- (c) (i) State **three** effects of dumping waste materials into water bodies.
- (ii) State **one** function of **each** of the following factors in photosynthesis:
- chlorophyll;
 - water [5 marks]
- (d) (i) What is *work*?

- (ii) A block of wood of mass 10 kg was dragged through a distance of 3.2 m when a force of 20 N was applied. Calculate the work done. [5 marks]

ANSWERS

- (i) Ensure that **all spellings are correct** to score mark.
- (ii) Wherever there are more options than the question requires, **provide only the number required** by the question.

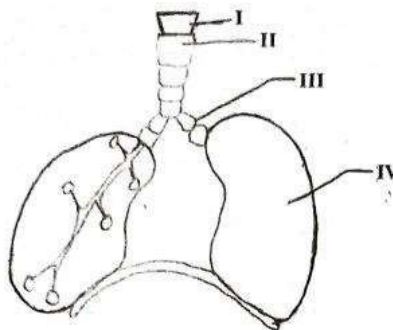
1. (a) The diagrams below are illustrations of an experimental set-up. Study the diagrams carefully and answer the questions that follow.



- (i) Identify **each** of the parts labelled I, II and III. [3 marks]
I - beaker
II - residue / particles / cotton wool/ mixture / filter paper
III - filtrate
- (ii) Name the method of separation in **each** of the set-up: [2 marks]
(a) **A;** filtration
W) **B.** magnetization
- (iii) State the class of mixtures that the experimental set-up A could be used for. [1 mark]

- Solid-liquid mixture
 - Liquid-solid mixture
- (iv) Give a reason for the answer stated in (iii). [2 marks]
 Because there is a residue on the filter paper and a filtrate in the beaker
- (v) Name **one** possible component of the mixture in set-up **B**. [1 mark]
- iron filings / any magnetic substance
 - powdered sulphur
 - sand
 - powdered charcoal
 - powdered chalk
 - any solid substance
- (vi) State the function of the part labelled **IV**. [1 mark]
 Is to hold the funnel in place / holds the clamp

(b) The diagram below is an illustration of a part of a system in human. Study the diagram carefully and answer the questions that follow.



- (i) Name the system illustrated. [1 mark]
 Respiratory system
- (ii) Name **each** of the parts labelled **I**, **II**, **III** and **IV**. [4 marks]
- I - Larynx / voice box
 II - Trachea / windpipe

III - Bronchus

IV - lung

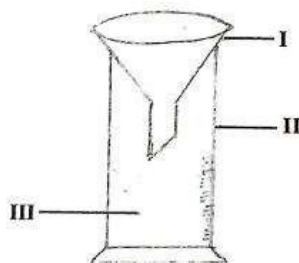
(iii) What is the role of the part labelled **I**.

[1 mark]

allows air to pass through it
prevent food and drink from blocking
the airways produces sound /
phonation

- (iv) Name **three** diseases that affects the system illustrated. Pneumonia [3 marks]
Tuberculosis/
T.B. Bronchitis
Whooping
cough Lung
cancer
Influenza
Asthma

- (c) The diagram below is an illustration of an experimental set-up used to measure an ecological factor.
Study the diagram carefully and answer the questions that follow.



- (i) Identify the apparatus illustrated. [1
mark] Rain gauge
- (ii) Name **each** of the parts labelled I, II and **III**. [3 marks]
- I funnel
II - measuring cylinder
III - rain water / water
- (iii) Give one use **each** of the parts labelled I and **II**. [2 marks]
- I directs rain water into measuring cylinder
II - use to measure the amount/ volume of rain water / collect rain water

(iv) What ecological factor was measured?

[1

mark] Rainfall / amount of rainfall / rain

- (v) State **three** ways in which the ecological factor measured in (iv) is important in agricultural soils. [3 marks]

an agent of weathering of rocks
 in the soil dissolves plant
 nutrients for easy absorption
 aids in easy tillage of soil
 organisms promotes activities of
 soil organisms needed for seed
 germination
 protects plant roots from
 injury causes leaching
 causes
 erosion
 makes soil
 fertile
 determines the type of crop
 to grow helps plants to
 prepare their own food
 determine amount of water
 in the soil etc

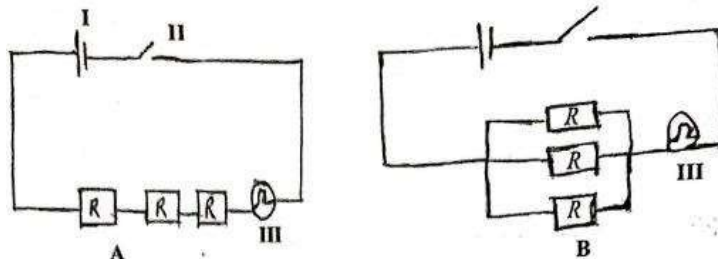
- (vi) Name **one** farm tool that aids the ecological factor measured in (iv) to perform its function in agricultural soils. [1 mark]

Handfork /hoe/ any tool that can be used to dig soil.

- (vii) Describe how the farm tool named in (vi) is used to aid the factor measured in the experiment. [2 marks]

It is used to loosen hard soil surface after heavy rainfall

- (d) The diagrams below are illustrations of electrical circuits.
 Study the diagrams carefully and answer the questions that follow.



(i) Identify **each** of the components labelled I, II and **III**. [3 marks]

I cell

II - switch / key

III - lamp / bulb

(ii) State the type of arrangement of resistors (R) in **B**. [1 mark]

parallel

- (iii) State the effect of the arrangement of resistors in **each** of the diagrams A and **B on III**.

[2 marks]

- A - makes III / bulb dim
B - makes III / bulb bright

- (iv) Give a reason for **each** of the answers stated in (iii). [2 marks]

- A - the resistors in series have an increased resistance
B - resistors in parallel have decreased resistance hence keeps the bulb bright

SECTION B

[60 marks]

Answer four questions only from this section

2. (a) State **three** differences between *metals* and *non-metals* in terms of their physical properties.

[3 marks]

METALS	NON-METALS
Conduct heat / good conductor of heat	does not conduct heat / non-conductor of heat/ poor conductor of heat
Conducts electricity	does not conduct electricity / poor conductor of electricity
Malleable	- Not malleable
Ductile	Brittle / not ductile
high density	low density
high melting point	low melting point
generally hard	generally soft
lustrous	dull

- (b) (i) Explain the term *active* region as applied to transistors;

When base-emitter junction is forward biased and base-collector junction is reverse biased.

(ii) State what happens in the active region of a transistor. [3

marks] Transistor behaves as an amplifier

(c) (i) State **two** effects of lack of protein in the diet of humans

weakness and
fatigue stunted
growth
affects the formation of enzymes /
hormones leads to kwashiorkor
marasmus
anaemia
metabolism slows
down swelling in
the legs / feet hair
and nail problem
slow healing of
wounds
greater risk of bone fracture
makes it harder to keep one's balance

(ii) Describe **briefly** the chemical test for glucose. [5 marks]

Fehling's / Benedict's solution is added to the test sample/ substance and heated a brick red/ reddish brown colouration indicates the presence of glucose.

(d) (i) What are *soil resources*?

These are materials / components in the soil that support plant growth.

(ii) State **two** agricultural activities which make the soil lose its

nutrients. [4

marks] excessive drainage / run off
continuous cropping / over cropping
burning of organic matter / crop of residue / bush
burning irrigation leading to leaching
crop
removal
over
grazing
poor tillage practices
excessive use of chemical
fertilizers deforestation /
cutting down of trees etc

3. (a) List in the **correct** order, the organs through which food passed from the mouth

to the anus.

[2 marks]

Correct order for the passage of food

Mouth ----> oesophagus ----> stomach ----> small intestine ----> large intestines + anus

(b) State the components of a balanced ration for feeding poultry. [4 marks]

carbohydrates
protein
fats and oil /
lipids minerals
vitamin
s water

(c) Predict the products formed when:

(i) magnesium solution reacts with dilute hydrochloric acid;

Magnesium chloride and hydrogen / MgCl₂ and H₂

(ii) potassium reacts with water.

[4 marks]

Potassium hydroxide and hydrogen / KOH and H₂

(d) (i) State **two** effects of heat on a substance.

change of state / melts /
vapourises expansion /
contraction / change of shape
increasing temperature / decreasing temperature

(ii) Potassium permanganate crystals are dropped into a beaker of water and warmed:

(a) State what would be observed;

warm coloured water moves from the bottom of the beaker upwards.

() State the phenomenon demonstrated in (a)

[5 marks]

Heat transfer by convection
Diffusion

4. (a) (i) Name the stages **in** the life cycle of a mosquito.

egg
larva
pupa
adult / imago

[5 marks]

(ii) Name the stage at which feeding **does not** take place.

pupa

(b) Explain **briefly** why air is regarded as a mixture. [2 marks]

air contains different elements which are physically combined
OR

consist of different substances which can be separated by physical means / methods

(c) (i) What is a magnetic pole?

They are point / area on a magnet where the magnetic force is greatest where all lines of force appear to come out from or appear to enter.

(ii) State **two** uses of temporary magnets. [4

marks] electric bell
loudspeaker
telephone earpiece
generators / electric motors / dynamo

(d) Give **four** reasons for planting crops in rows. [4

marks] it improves drainage
it keeps plant roots evenly spaced
machines can be used on the farm easy to replace
ungerminated seeds facilitate easy movement on the farm
enable larger plant population per unit of plot easy to know plant population on farm
easier to carry out other activities on the farm / any other cultural practice allow free movement of air
better access to sunlight for more yield
control pest control disease etc

5. (a) (i) Name **two** elements which make the teeth of mammals strong.

calcium
phosphorus
fluorine

(ii) Name **two** common diseases of the human teeth.

[4

marks] Dental caries / cavity/ tooth decay

Gum disease/ gingivitis/ periodontal
disease Plaque

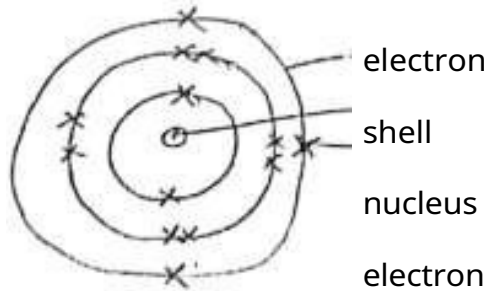
- (b) State **three** reasons why sandy soil **cannot** support effective plant growth.

[3 marks]

easily eroded
heats up very easily/ can easily
dry out poor in nutrient content /
less fertile susceptible to
leaching
cannot hold enough water / easy for water to
filter out

- (c) An atom has 13 protons and 14 neutrons:

- (i) Draw and label the structure of the atom.



[4 marks]

- (ii) State its valency.

Three (3)

- (d) (i) State **three** ways in which fluid pressure is applied in everyday activities.

water
pumps car
brakes
syringes
siphon
drinking
straw
enema
pumping
tyre
inflating balloons

(ii) State **one** substance that is an insulator.

[4 marks]

dry wood

air

glass

plastic

ice

rubber

ceramic

cloth

etc

6. (a) Explain the term *mixed cropping*. [2 marks]

It is a system of farming where two or more crops are grown on the same piece of land at the same time / simultaneously.

- (b) (i) What is an *alloy*?

A solid solution / uniform mixture / substance of two or more metals / a non-metal and a metal.

- (ii) Name the constituent elements in brass. [3 marks]

Copper and Zinc

- (c) (i) State **three** effects of dumping waste materials

into water bodies. decompose to give the

water bad odour.

makes the water dirty/ cloudy/ pollutes water/ unsafe for drinking reduces oxygen level in the water

introduces germs / diseases into the water flooding

etc

- (ii) State **one** function of **each** of the following factors in photosynthesis:

(a) chlorophyll for absorption of sunlight / converts CO₂ and H₂O into glucose. () water used to produce glucose / produces oxygen.

[5 marks]

- (d) (i) What is *work*?

Work is the product of force and the distance moved in the direction of the force. OR

When a force moves a body through a distance in the direction of force.

- (ii) A block of wood of mass 10 kg was dragged through a distance of 3.2 m when a force of 20 N was applied. Calculate the work done.

Work done Force x
 Distance 20
 X 3.2
 64 joules

