PAPER 2 — 1¼ hours

ESSAY

[100 marks]

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

Answer **all** *the questions in your answer booklet.*

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

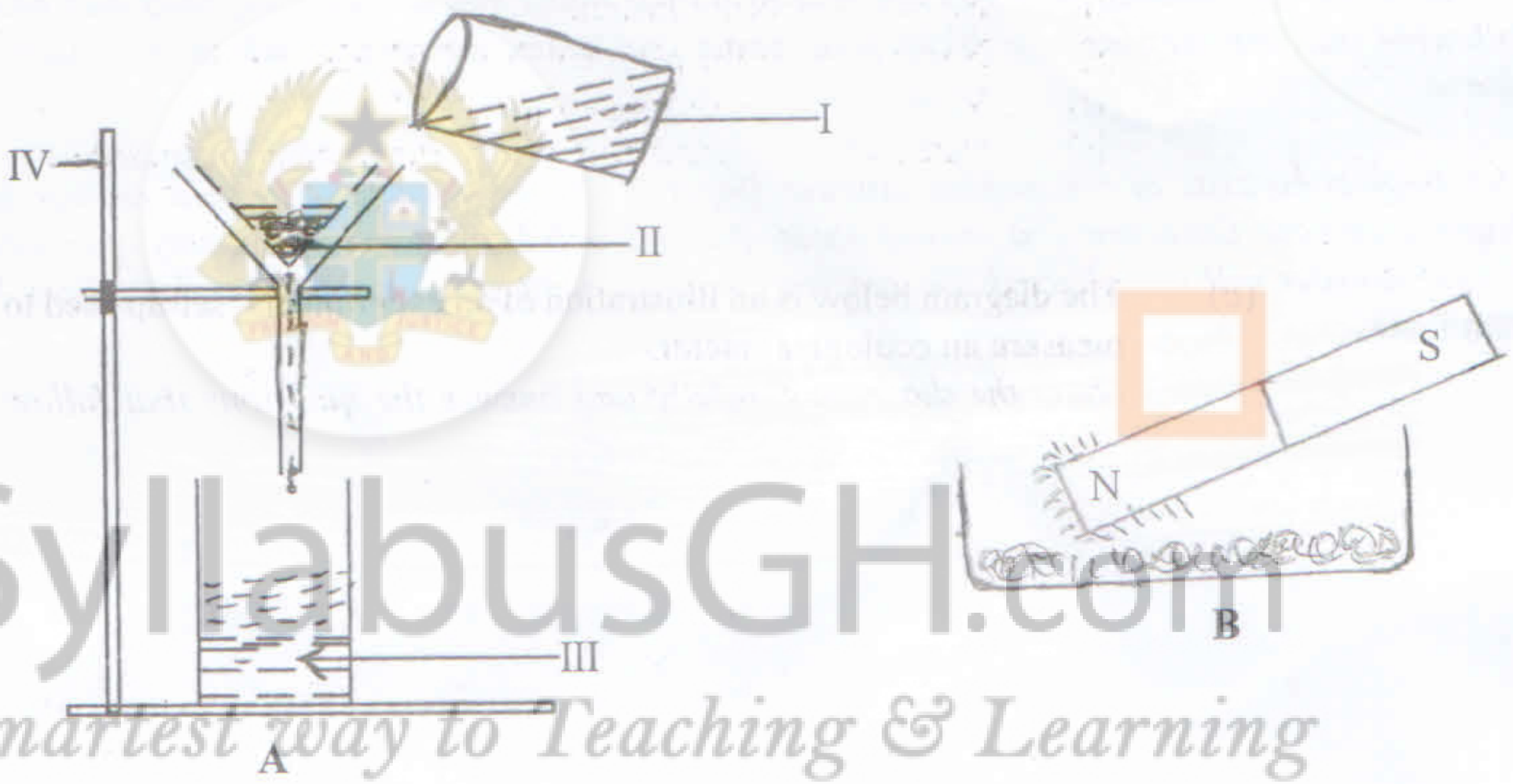
SECTION A

[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:

(α) **A**;

(β) **B**. [2 marks]

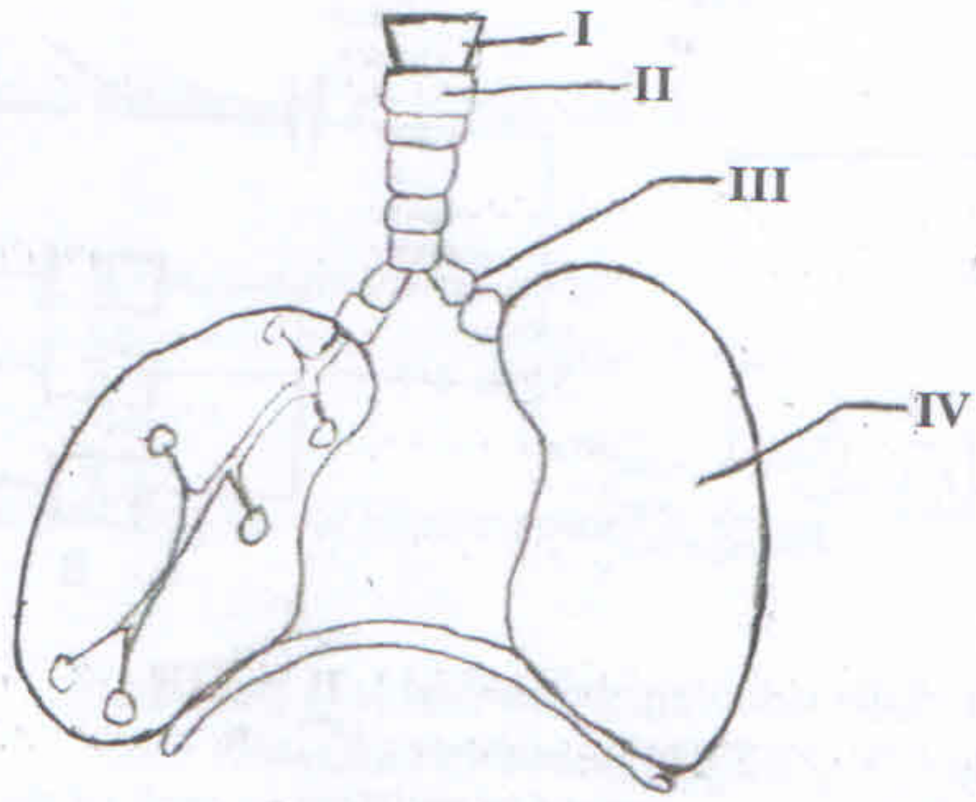
(iii) State the class of mixtures that the experimental set-up **A** could be used for. [1 mark]

(iv) Give a reason for the answer stated in (iii). [2 marks]

(v) Name **one** possible component of the mixture in set-up **B**. [1 mark]

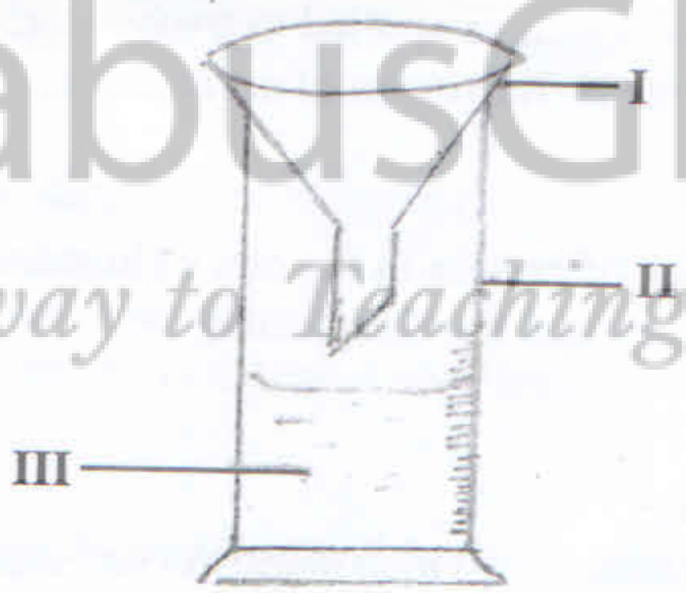
(vi) State the function of the part labelled **IV**. [1 mark]

(*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.



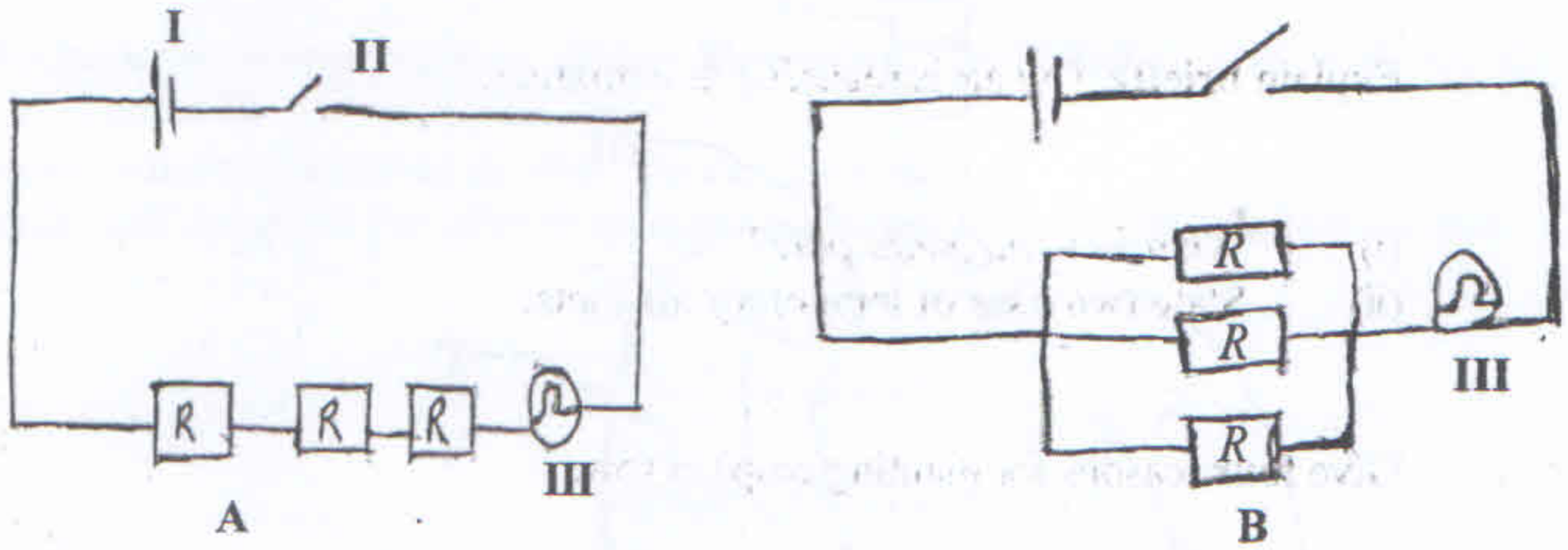
(i) Name the system illustrated. [1 mark]
(ii) Name **each** of the parts labelled **I**, **II**, **III** and **IV**. [4 marks]
(iii) What is the role of the part labelled **I**. [1 mark]
(iv) Name **three** diseases that affects the system illustrated. [3 marks]

(*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 passes 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:
(i) magnesium solution reacts with dilute hydrochloric acid;
(ii) 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:
(α) State what would be observed;
(β) State the phenomenon demonstrated in (α). [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:
(i) draw and label the structure of the atom.
(ii) State its valency.

[4 marks]

(*d*) (i) State **three** ways in which fluid pressure is applied in everyday activities.
(ii) State **one** substance that is an insulator.

[4 marks]

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:
(α) chlorophyll;
(β) 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]

END OF ESSAY TEST