



PAPER 2

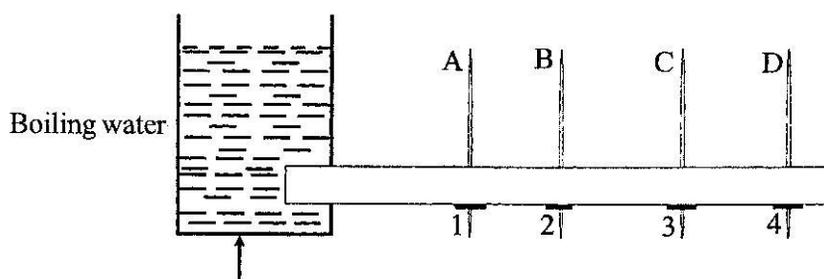
SECTION A [100 MARKS]

This paper consists of three sections; **A**, and **B**. Answer **one** question from Section A and any other four questions in Section B

PRACTICALS COMPULSORY [40 MARKS]

SECTION A

1. (a) In an experiment, four nails 1, 2, 3 and 4 are fixed with candle wax onto a metal bar and one end of the bar is heated by means of boiling water as shown in the diagram below

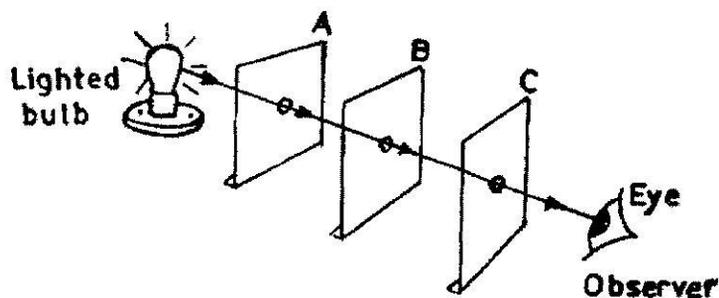


A, B, C, D are thermometers inserted in holes along the bar to measure the temperatures at the various points.

- (i) What is the temperature of the boiling water?
- (ii) State the observations that will be made about nails 1, 2, 3 and 4
- (iii) State the observations that will be made about the temperatures recorded by thermometers A, B, C and D.
- (iv) What mode of heat transfer is demonstrated in the experiment
- (v) State one effect of heat that is associated with the experiment
- (vi) State the aim of the experiment [10 marks]

(b) In an experiment to demonstrate a property of light, three cardboards, **A**, **B** and **C** with holes in their centres are arranged in a straight line between a lighted bulb and an observer as shown in the illustration below.

Study the illustration carefully and use it to answer the questions that follow



- (i) What would the observer see from the position shown?
  - (ii) What would the observer see when cardboard **B** is slightly displaced from the line?
  - (iii) Explain the observation made in (a)(ii) above.
  - (iv) What would be observed when the cardboard **B** is brought back to its original position?
  - (v) What property of light is being demonstrated in this experiment?
  - (vi) Mention
    - (a) **two** natural occurrences that could be explained by the property of light demonstrated.
    - (b) **one** device that works on the property of light demonstrated.
- [10 marks]

- (c) In an experiment the following activities were carried out on two green leaves A and B.

Leaf A was from a plant placed in the sunlight for some time while leaf B was from a plant placed in a dark cupboard for 24 hours.

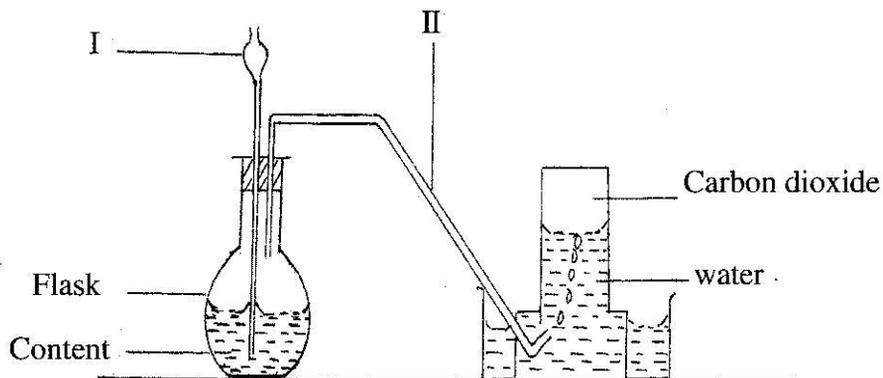
	<i>Activity</i>
I.	Leaves dipped in boiling water for 1 minute
II.	Leaves dipped in warm alcohol
III.	Leaves washed in cold water
IV.	Leaves dipped into iodine solution

After dipping in the iodine solution, it was observed that leaf A changed colour while leaf B did not change colour.

Answer the following questions:

- (i) Explain why each of the activities I, II, III and IV was carried out.
- (ii) State the colour change of leaf A
- (iii) Explain why leaf A changed colour but leaf B did not.
- (iv) Suggest an aim for the experiment. [10 marks]

(d) The diagram below shows the set-up for the preparation of carbon dioxide in the laboratory.



- (i) Name the parts of the set-up labelled **I** and **II**
- (ii) Give the name of the method of gas collection shown in the diagram.
- (iii) Give one property of gases collected over water
- (iv) What will happen if component **I** does **not** dip into the contents of the flask?
- (v) List **two** compounds that form the content of the flask.
- (vi) Write down the systematic name of carbon dioxide.

[10 marks]

### SECTION B

Answer **four** questions **only** from this part

2. (a)
  - (i) What are ruminants?
  - (ii) Give **two** examples of ruminants
- (b)
  - (i) What is force?
  - (ii) State **two** effects of forces on a body

- (c) (i) Mention **two** ways in which the carbon cycle can be maintained.  
(ii) State **one** environmental effect when the carbon cycle is disrupted
- (d) (i) Mention the **three** sub-atomic particles  
(ii) State the relative charge on **each** of the **three** sub-atomic particles mentioned in (d) (i) above.  
(iii) Name the particle formed when an atom loses an electron
- 3.** (a) (i) What is a simple machine?  
(ii) Give **two** examples of a simple machine
- (b) (i) What is rusting?  
(ii) State **two** effects of rusting
- (c) (i) What are food nutrients?  
(ii) Classify the following food items as carbohydrate, fats and oil or protein:  
Beans, palm fruits, meat margarine, bread and maize.
- (d) (i) State **two** effects of malnutrition in farm animals.  
(ii) Mention **one** disease of farm animals caused by virus.
- 4.** (a) (i) What is a vector of a disease  
(ii) State **two** methods **each** by which the vectors of the following diseases can be destroyed:  
α) river blindness;  
β) malaria
- (b) Write down the systematic names of the following compounds:  
(i)  $\text{CaCO}_3$   
(ii)  $\text{FeS}$   
(iii)  $\text{NaCl}$   
(iv)  $\text{NaOH}$
- (c) (i) Give the two properties that are common to all states of matter.  
(ii) In an experiment to determine density, a stone of mass 60 g is put into a bowl containing water.

If the level of the water rises from the 60 cm<sup>3</sup> mark to 75 cm<sup>3</sup>, determine the density of the stone.

5. (a) (i) Define *pressure*.  
(ii) Explain why it is important to sharpen a knife before use  
[4 marks]
- (b) (i) State **two** differences between *metals* and *non-metals*  
(ii) What is an *alloy*?  
(iii) Mention the components of **each** of the following alloys:  
(α) steel  
(β) brass  
[6 marks]
- (c) Mention **three** conditions suitable for rearing tilapia in a fishpond  
[3 marks]
- (d) Explain how the streamlined body of a bony fish enables it to live successfully in water  
[2 marks]
6. (a) (i) What is the difference between *unicellular organism* and *multicellular organism*  
(ii) State two reasons why vegetable crops are important to humans  
[4 marks]
- (b) (i) State **two** elements of climate  
(ii) What is the difference between *climate* and *weather*?  
[4 marks]
- (c) Mention **three** advantages of staking in crop production  
[3 marks]
- (d) Explain **each** of the following processes:  
(i) corrosion;  
(ii) sublimation  
[4 marks]

**END OF ESSAY TEST**

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***YOU WILL BE SEVERELY PENALISED IF YOU ARE FOUND LOOKING AT THE  
NEXT PAGE BEFORE YOU ARE TOLD TO DO SO***

## OBJECTIVES

1. An example of a noble gas is
  - A. chlorine
  - B. neon
  - C. nitrogen
  - D. oxygen
  
2. The structure that stores sperms temporarily in the male reproductive system of humans is
  - A. epididymis
  - B. scrotal sac
  - C. sperm duct
  - D. testes
  
3. Which of the following properties of alcohol as a thermometric liquid is correct?
  - A. It is opaque
  - B. It does not wet glass
  - C. It has a very low freezing point
  - D. It has a high freezing point
  
4. In which of the following vegetation zones of Ghana does millet and sorghum grow well?
  - A. Coastal savannah
  - B. Forest zone
  - C. Guinea savannah
  - D. Transition zone
  
5. Which of the following methods is/are used for preserving fish?
  - I. Canning
  - II. Frying
  - III. Smoking
  - A. I only
  - B. I and II only
  - C. II and III only
  - D. I, II and III

6. Which of the following practices in the home can prevent disease infection?
- A. Covering one's food
  - B. Drinking unclean water
  - C. Keeping one's surroundings untidy
  - D. Sharing towels and sponges
7. An example of a semimetal is
- A. calcium
  - B. lithium
  - C. silicon
  - D. sodium
8. Which kind of energy transformation takes place in an electric motor?
- A. Chemical energy to electrical energy
  - B. Chemical energy to mechanical energy
  - C. Electrical energy to light energy
  - D. Electrical energy to mechanical energy
9. *Landrace* is a breed of
- A. cattle
  - B. goats
  - C. pigs
  - D. sheep
10. In flowering plants, the stamen is made up of
- A. anther and stigma
  - B. anther and filament
  - C. stigma and filament
  - D. stigma and style
11. A simpler way of maintaining the efficiency of a machine is by
- A. oiling its parts
  - B. fitting new parts on the machine
  - C. making sure it is always working
  - D. making sure it works at low speed.
12. The part of a seed which grows to become the shoot of a plant is the
- A. cotyledon

- B. plumule
- C. radicle
- D. testa

**13.** One disease that affects the nervous system of humans is

- A. filariasis
- B. measles
- C. poliomyelitis
- D. typhoid

**14.** Which of the following life processes leads to the release of energy?

- A. Absorption of food
- B. Digestion of food
- C. Photosynthesis
- D. Respiration

**15.** Mineral salts in dead organisms are released into the soil by a process called

- A. decomposition
- B. diffusion
- C. leaching
- D. osmosis

**16.** Spectacles fitted with concave lenses are worn by people suffering from

- A. loss of accommodation
- B. total blindness
- C. long sightedness
- D. short sightedness

**17.** Which of these organs in humans releases carbon dioxide as a waste product?

- A. Kidney
- B. Liver
- C. Lung
- D. Skin

**18.** Farmers do not plant the stems of maize because the stems

- A. do not have buds
- B. are difficult to obtain

- C. dry up too quickly
- D. do not contain food

**19.** Which of the following ways of treating water makes the water soft?

- A. Adding alum
- B. Adding washing soda
- C. Chlorinating
- D. Filtering

**20.** Water that needs a small amount of soap to form lather is described as

- A. clean
- B. hard
- C. pure
- D. soft

**21.** Which of the following devices requires the use of transistors in its operation?

- A. Computer
- B. Electric heater
- C. Microphone
- D. Wall clock

**22.** Feel Method is used to determine soil

- A. air
- b. colour
- C. structure
- D. texture

**23.** Which of the following modes of heat transfer is the thermos flask designed to minimize?

- I. Conduction
- II. Convection
- III. Radiation

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

24. An atom of an element is represented as  ${}_{12}^{25}\text{X}$ . What is the respective number of neutrons and protons in the atom?
- A. 12 and 13
  - B. 12 and 25
  - C. 13 and 12
  - D. 25 and 12
25. The anemometer is an instrument used in determining
- A. amount of rainfall
  - B. speed of wind
  - C. relative humidity
  - D. intensity of light
26. Which of the following subjects is/are considered as applied science?
- I. Biology
  - II. Medicine
  - III. Psychology
- A. I only
  - B. I and II only
  - C. I and III only
  - D. II and III only
27. *Chinchilla* is a breed of
- A. goats
  - B. pigs
  - C. rabbits
  - D. sheep
28. Which of the following characters is **not** acquired through heredity?
- A. Language spoken
  - B. Shape of nose
  - C. Colour of eyes
  - D. Temperament
29. The food nutrient which ensures good health in farm animals is
- A. carbohydrates

- B. minerals
- C. proteins
- D. vitamins

- 30.** The use of resistant breeds of farm animals to control pests is a
- A. biological method
  - B. chemical method
  - C. cultural method
  - D. physical method
- 31.** Which of the following arrangements show the correct order of increasing complexity of structures in living organisms?
- A. cells → organs → tissues → systems
  - B. cells → tissues → organs → systems
  - C. cells → systems → tissues → organs
  - D. cells → tissues → systems → organs
- 32.** The mosquito and housefly are harmful in that they
- A. suck blood
  - B. bite and cause pain
  - C. settle on food
  - D. spread diseases
- 33.** Which of the following diseases affects the central nervous system?
- A. Cerebro Spinal Meningitis (CSM)
  - B. Poliomyelitis
  - C. Measles
  - D. Yellow Fever
- 34.** Day and night occur because the earth
- A. moves round the sun
  - B. moves from east to west
  - C. moves round the moon
  - D. rotates on its axis
- 35.** Bronze is an alloy of
- A. iron and carbon
  - B. zinc and copper
  - C. iron and zinc
  - D. copper and tin

36. Which of the following substances causes acid rain when released into the atmosphere?
- A. Carbon dioxide      B. Water vapour      C. Sulphur dioxide  
D. cement dust
37. Which of the following gases helps in rusting?
- A. Carbon dioxide      B. Hydrogen      C. Oxygen      D. Nitrogen
38. The force of attraction between molecules of different substances is called
- A. adhesion      B. cohesion      C. tension  
D. viscosity
39. A metal block has a mass of 0.1kg. Calculate its volume if the density is  $1.0 \text{ kgm}^{-3}$ .
- A.  $0.01 \text{ m}^3$       B.  $0.10 \text{ m}^3$       C.  $1.00 \text{ m}^3$   
D.  $10.00 \text{ m}^3$
40. The food manufactured by a plant is distributed to all parts of the plant through the
- A. chlorophyll      B. phloem      C. stomata  
D. xylem

***END OF OBJECTIVE TEST***