

INTEGRATED SCIENCE

SCHEME OF EXAMINATION

There will be three papers, Papers 1, 2 and 3 all of which must be taken. Papers 1 and 2 will be a composite paper to be taken at one sitting.

PAPER 1: Will consist of fifty multiple-choice objective questions all of which must be answered within 1 hour for 50 marks.

PAPER 2: Will consist of six essay-type questions. Candidates will be required to answer four questions within 1 hour 30 minutes for 20 marks each.

PAPER 3: Will consist of four questions on test of practical work. Candidates will be required to answer all the questions within 2 hours for 60 marks.

SAMPLE QUESTIONS

PAPER 1

(OBJECTIVE TEST)

- The pH of water is
 - 2.
 - 5.
 - 7.
 - 14.
- One characteristic feature of Kingdom Animalia is the possession of
 - cellulose cell wall.
 - nervous system.
 - starch granules.
 - chlorophyll.
- Which of the following statements explains the occurrence of large number of carbon compounds? Carbon
 - is present in all living things
 - atom is tetravalent element
 - compounds dissolve readily in organic solvents
 - compounds burn readily in air

4. The instrument used to measure diameter of a thin wire is
 - A. thread and rule.
 - B. engineer's callipers.
 - C. micrometer screw gauge.
 - D. spherometer.

5. A species **X** has 16 protons, 17 neutrons and 18 electrons. **X** must be
 - A. neutral atom equal of a metal.
 - B. a cation of two positive charges.
 - C. an anion of two negative charges.
 - D. an anion of one negative charge.

6. The **main** effect of diseases on crops is
 - A. reduction in photosynthesis.
 - B. inability of roots to absorb water.
 - C. shortening of internodes.
 - D. reduction in the yield of produce.

7. A car fuse is marked 15A and operates on a 12 volt battery. Determine the resistance of the fuse wire.
 - A. 0.8 ohms
 - B. 1.3 ohms
 - C. 3.00 ohms
 - D. 27.00 ohms

8. Rabbits are housed in a
 - A. pen.
 - B. hutch.
 - C. kraal.
 - D. sty.

9. Which of the following parts of a mammalian skin protects the tissues beneath from mechanical injury?
 - A. Dermis
 - B. Cornified layer
 - C. Granular layer
 - D. Malphigian layer

10. An element which can be considered as a semi-metal is
 - A. argon.
 - B. carbon.
 - C. silicon.
 - D. sodium.

11. Respiration is essential to life since
- A. food is oxidised.
 - B. oxygen is used up.
 - C. waste products are eliminated.
 - D. energy is released.
12. Which of the following statements about the importance of mulching are correct?
- I. Prevention of the surface of soil from caking
 - II. Conservation of moisture
 - III. Washing away of dissolved nutrients
 - IV. Keeping the soil cool
- A. I and II only
 - B. III and IV only
 - C. I, II and III only
 - D. I, II and IV only
13. A pulley system is used to lift a load of 300N. If the effort applied is 150N, determine the mechanical advantage of the system.
- A. 0.5
 - B. 2.0
 - C. 150
 - D. 450
14. The **easiest** method of fertilizer application is
- A. band application.
 - B. broadcasting.
 - C. ring application.
 - D. spraying.
15. Which of the following characteristic features are associated with insect-pollinated flower?
- I. Brightly coloured petals
 - II. Large petals
 - III. Horny guider
 - IV. Pendulous stamen
- A. I and II only
 - B. III and IV only
 - C. I, II and III only
 - D. I, II and IV only

PAPER 2

(ESSAY)

1. (a) (i) What is a *transistor*?
(ii) Explain how a transistor behaves as a switch. [5 marks]
- (b) (i) Explain the term *poultry*.
(ii) State **four** reasons for keeping poultry. [6 marks]
- (c) Explain the following terms:
(i) *population*;
(ii) *species*. [5 marks]
- (d) (i) What are *x-rays*?
(ii) State **two** dangers associated with over exposure to x-rays. [4marks]
2. (a) (i) What is *plant tissue culture*?
(ii) State **three** advantages of propagating a plant by tissue culture. [5 marks]
- (b) (i) Explain the term *parturition* as applied to animal production.
(ii) State **three** signs shown by an animal when parturition is about to occur. [5 marks]
- (c) Draw and label a ray diagram to show how the image of a point object is seen in a plane mirror. [5 marks]
- (d) A piece of zinc metal was placed in a beaker containing dilute hydrochloric acid.
(i) Write a balanced chemical equation for the reaction that took place.
(ii) If 10.4g of zinc was placed in the hydrochloric acid, determine the amount, in moles of hydrochloric acid, that would be required to react with the zinc completely.
[Zn = 65.4, H = 1, Cl = 35.5] [5 marks]
3. (a) Explain the following terms as applied to sound waves:
(i) *frequency*;
(ii) *loudness*;
(iii) *pitch*. [6 marks]
- (b) (i) What is *crop rotation*?
(ii) State **two** advantages of crop rotation. [4 marks]
- (c) (i) List **three** kingdoms used in the classification of living things.
(ii) State **two** reasons for classification of living things. [5 marks]
- (d) (i) Explain briefly how **each** of the following processes occurs:

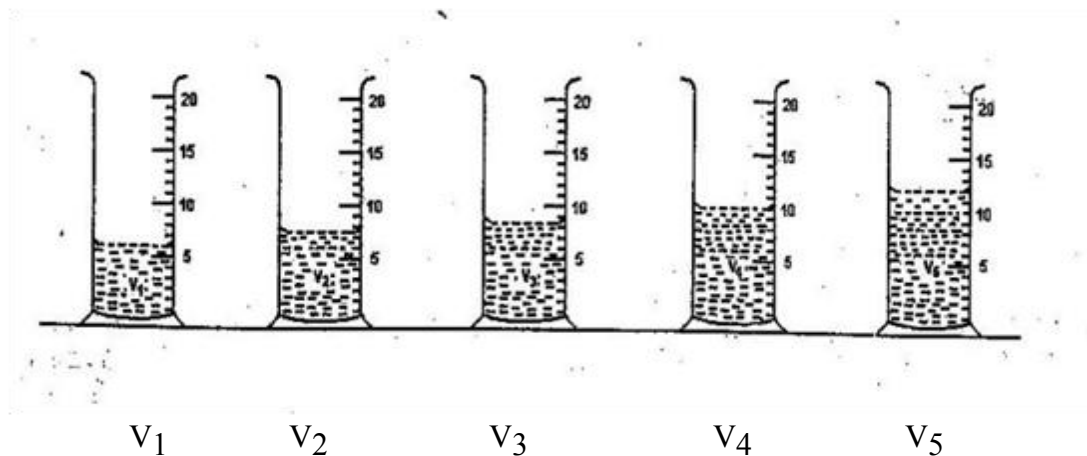
- (i) melting of a solid;
- (ii) condensation of a gas.

[5 marks]

PAPER 3

(TEST OF PRACTICAL WORK)

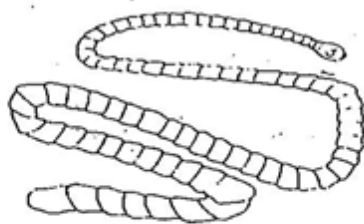
1. A stock solution of 1M HCl was prepared by dissolving 3.65 g of HCl in 100 cm³ of distilled water. 5 cm³ of the stock solution was put into each of the five measuring cylinders labelled V₁, V₂, V₃, V₄, and V₅ and diluted with different amounts of distilled water to the volumes shown in the diagram below.



- (a) (i) Read and record the volumes of the solution in each of the measuring cylinders labelled V₁, V₂, V₃, V₄, and V₅ respectively.
- (ii) Determine the volume of water used to dilute 1M HCl in each of the measuring cylinders. [8 marks]
- (b) Calculate the concentration of solution in measuring cylinder V₄ in
 - (i) mol dm⁻³
 - (ii) g dm⁻³

[6 marks]

2. The Figures F and G below illustrate organisms associated with farm animals. Study the figures carefully and answer the questions that follow



F



G

- (a) Identify organisms **F** and **G**. [2 marks]
- (b) Which group of parasites do organisms **F** and **G** belong to? [2 marks]
- (c) State **two** symptoms **each** of the infestation of organisms **F** and **G** on the animals they inhabit. [4 marks]
- (d) Briefly explain **two** common methods **each** of controlling organisms **F** and **G**. [8 marks]