

BECE BOOSTER  
INTEGRATED SCIENCE  
Essay and Objective  
2 hours

2&1

Name: .....

Index number: .....

## DAS B.E.C.E PERFORMANCE BOOSTER

### BASIC EDUCATION CERTIFICATE MOCK

INTEGRATED SCIENCE

2 hours

[100 marks]

Write your **name** and **index number** in **ink** in the spaces provided above

This booklet consists of two papers. Paper 2 is in two sections: **A** and **B**. Answer all questions section **A** and four questions in section **B**.

Answer paper 2 on the question paper.

Paper 2 will last 1 hr. 15 minutes after which the drawing sheets will be collected

Answer paper 1 on your objective test answer sheet

Do not start paper 1 until you are told to do so. Paper 1 will last 45 minutes

ESSAY  
[100 marks]

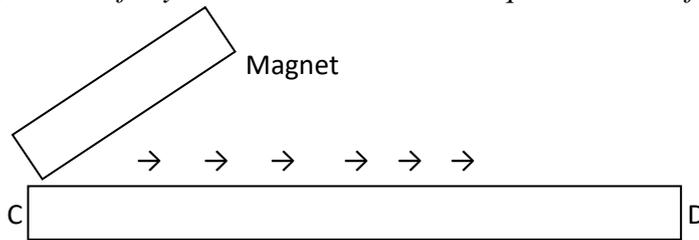
This paper is in two sections: **A** and **B**. Answer *Question 1* in section **A** and any other **four** questions in section **B**. Answer **all** the questions in your question paper  
Credit will be given for clarity of expression and orderly presentation of material

SECTION A  
[40 marks]

Answer all of *Question 1*

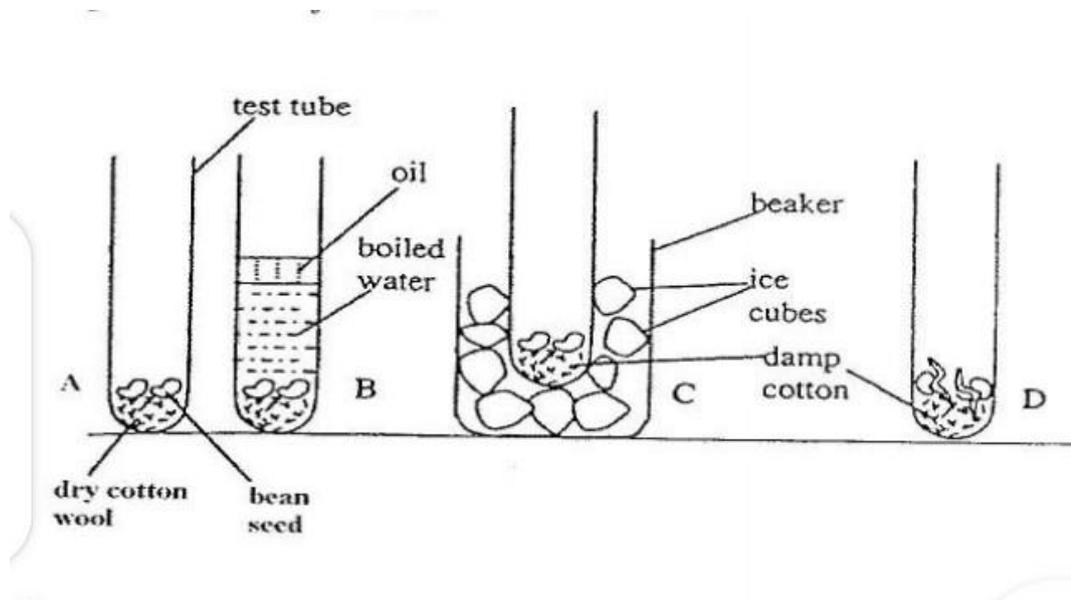
1. (a) In an experiment, a magnet was dragged over the surface of an iron bar from C to D several times as shown in the diagram

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



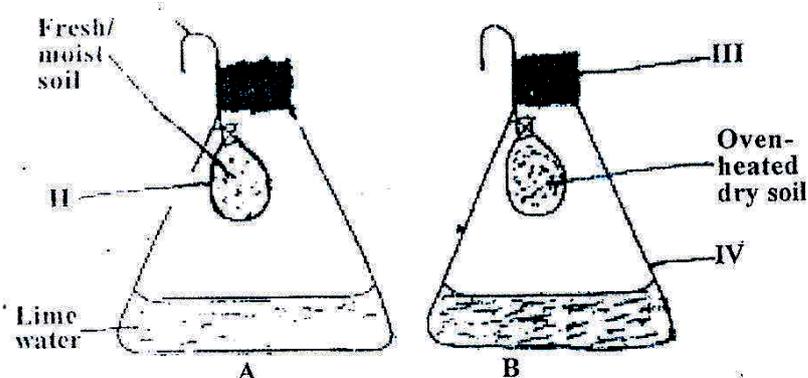
- (i) State the aim of the experiment [2 marks]
- (ii) State the type of method used in the experiment [1 mark]
- (iii) State the polarity of the end of the magnet used in the process, if the ends C and D of the bar become a north pole and a south pole respectively. [1 mark]
- (iv) How would you test that the bar CD is a magnet? [3 marks]
- (v) State one precaution that should be taken during the experiment [1 mark]
- (vi) Name two methods that would be used for this process other than the one stated in (ii) [2 marks]

- (b) The diagram labelled A, B, C and D below are illustrations of an experimental set-up used to investigate conditions necessary for germination of seeds. Study the diagrams and answer the questions that follow.

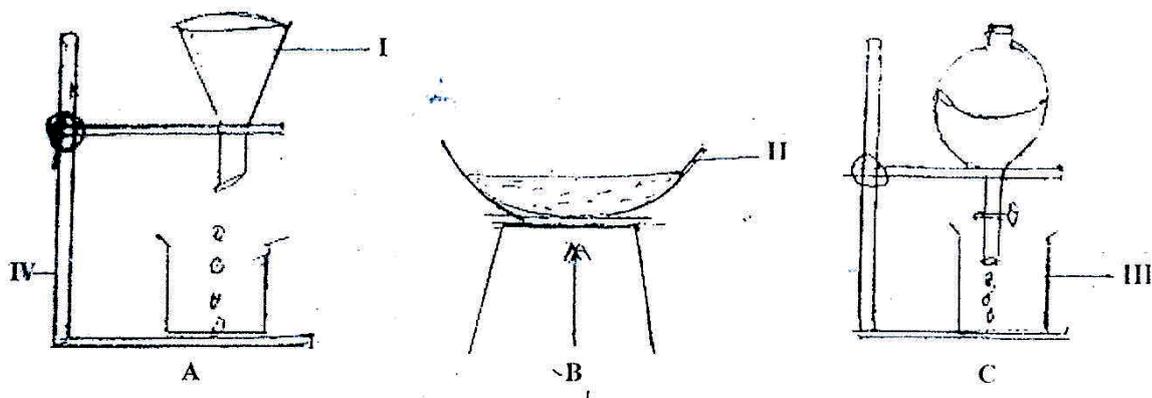


- (i) State the conditions which is absent in each of the diagrams labelled A, B, C, and D [3mark]  
 (ii) What is the purpose of the diagram labelled D in the set-up? [1 mark]  
 (iii) What is the role of:  
 (α) oil in the diagram labelled B [1 mark]  
 (β) ice cubes in the diagram labelled C  
 (λ) dry cotton wool in the diagram labelled [6 marks]

(c) The diagrams represent how to determine a component of a soil. Use them to answer the questions



- (i) Name each of the parts labeled I, II, III and IV [4 marks]  
 (ii) If the set – up is left for three days, state what would happen to the lime in each of the diagrams A and B [2 marks]  
 (iii) What is the function of the part labeled III? [1 mark]  
 (iv) Give **one** reason **each** for the answers given in (ii) [4 marks]  
 (v) What is the conclusion of the experiment [1 mark]
- (d) The diagrams represent separation of mixtures. Study the diagrams carefully and answer the questions that follow



- (i) Name each of the parts labeled I, II, III and IV [4 marks]  
 (ii) Name the separation method illustrated by each of the diagrams [3 marks]  
 (iii) Which of the set-ups could be used to separate water from kerosene water mixture [1 mark]  
 (iv) Which of the set – ups could be used to obtain clear water from muddy water? [1 mark]  
 (v) Which of the set-ups could be used to obtain salt from salt solution [1 mark]

## SECTION B

[60 marks]

*Answer four questions only from this section*

2. (a) (i) State whether each of the following is a chemical change or physical change  
 α) Rusting  
 β) Expansion of copper  
 γ) Filtration  
 δ) Burning

- (ii) Give a reason for your answer in (i)( $\alpha$ ) [5 marks]
- (b) (i) List three components of an electronic circuit
- (ii) State one function each of two of the components listed in (i) [5 marks]
- (c) What is a vegetable crop? [2 marks]
- (d) (i) Explain briefly the term infectious disease
- (ii) State one of the most common infectious diseases [3 marks]
3. (a) State three features which can be used to distinguish between the different layers of a typical well developed soil profile [3 marks]
- (b) Name the separation method used in the production of each of the following substances:
- (i) akpeteshie (local gin);
- (ii) tap water;
- (iii) common salt [3 marks]
- (c) (i) State the role that the liver plays in digestion
- (ii) Name each of the following gametes
- ( $\alpha$ ) Female gametes in humans;
- ( $\beta$ ) Male gametes in a flowering plant;
- ( $\gamma$ ) Male gamete in humans [4 marks]
- (d) (i) What is the importance of a capacitor in an electrical circuit?
- (ii) What is an electrical conductor?
- (iii) State one way of conserving electricity in the home
4. (a) (i) State the two characteristics of transistors [4 marks]
- (ii) State two uses of transistors
- (b) (i) State two sources of organic matter in soil
- (ii) State two ways by which organic matter in soil can be maintained [4 marks]
- (c)(i) Name the components of an atom which determines each of the following quantities:
- ( $\alpha$ ) Mass of an atom;
- ( $\beta$ ) Charge of an atom
- (ii) Why is an atom electrically neutral? [3 marks]
- (d) (i) State two functions of water in the human body
- (ii) Write the word equation for aerobic respiration [4 marks]
5. (a) Which conventional colours can we use to identify the following
- Live:
- Neutral:
- Earth: [3 marks]
- (b) State four factors that bring about the difference in the farming systems in crops [4 marks]
- (c) (i) State stage in life cycle of a mosquito
- (ii) Name two stages in the life cycle of a flowering plant [4 marks]
- (d) (i) Explain how an oxygen atom becomes negatively charged
- (ii) Name one raw material used in each of the following processes
- ( $\alpha$ ) Gari production
- ( $\beta$ ) Biogas production [4 marks]
6. (a) Explain the following methods of heat transfer
- i. Convection
- ii. Radiation [3 marks]
- (b) (i) ( $\alpha$ ) State two ways in which temperature is important in crop production
- ( $\beta$ ) State one way in which light is important in crop production
- (ii) How do changes in weather help farmers in their production processes? [5 marks]
- (c) (i) State one use of the following alloys
- ( $\alpha$ ) Bronze:
- ( $\beta$ ) Steel
- (ii) Explain why we must shake a bottles of mixtures well before using them [4marks]
- (d) State three ways of maintaining balance in ecosystem [3 marks]

***END OF PAPER***

PAPER 1 [45 MINUTES] 40 MARKS

- The eclipse formed when the moon comes between the sun and the earth is known as
  - annular eclipse
  - lunar eclipse
  - solar eclipse
  - total eclipse
- The element with the chemical symbol S is
  - silicon
  - silver
  - sodium
  - sulphur
- The term leaching in soil refers to
  - accumulation of organic matter
  - decomposition of plant material
  - fixation of nitrogen
  - removal of soil nutrient by water
- Which of the following statements about plant cell is **correct**? It
  - does not have a nucleus
  - contains large vacuoles
  - is surrounded by the cell membrane only
  - does not have a definite shape
- An example of a *derived quantity* is
  - length
  - mass
  - temperature
  - volume
- Solid non-metals normally break into pieces when hammered because they are
  - brittle
  - ductile
  - lustrous
  - malleable
- Soils are obtained from a process called
  - burning
  - curling
  - soil formation
  - weathering of rock
- Producers in the ecosystem are plants that
  - attract insects
  - feed on other plants
  - feed on dead materials
  - manufacture their own food
- The form of energy produced from the nucleus of an atom is termed
  - chemical energy
  - mechanical energy
  - nuclear energy
  - thermal energy
- Which of the following elements is a semi-metal?
  - Carbon
  - Nitrogen
  - Silicon
  - Sodium

11. A system of farming that leads to continuous destruction of virgin forest is
- A. mixed farming      B. mixed cropping      C. pastoral farming      D. shifting farming
12. The by-products of respiration are
- A. carbon dioxide and heat      B. carbon dioxide and water
- C. oxygen and heat      D. oxygen and water
13. Which of the following statements about a force are **correct**? It
- I. is measured in newtons
- II. is measured in newton-metre
- III. can start a motion
- IV. can change the direction of a moving body
- A. I and II only
- B. I and III only
- C. I, II and IV only
- D. I, II, III and IV
14. Which of the following substances is a solid-gas mixture?
- A. Lather      B. Bronze      C. Steel      D. Smoke
15. Weeds on a school farm could be controlled by
- A. handpicking      B. mowing      C. ploughing      D. tilling
16. An example of a non-living tissue used in osmosis experiment is
- A. cellophane      B. filter paper      C. potato      D. polythene
17. Kerosene is poured on the surface of a pond in order to
- A. make it unsafe for human consumption
- B. make it safe for animal consumption
- C. increase the surface tension
- D. break the surface tension
18. Which of the following processes is used to separate insoluble solids from liquids?
- A. Crystallization      B. Evaporation
- C. Filtration      D. Sublimation
19. The process of cutting branches of plant is done with
- A. trimming shears      B. pruning shears      C. cutlass      D. knife
20. Which of the following pairs of diseases can be spread easily when food is exposed to houseflies?
- A. Dysentery and malaria      B. Malaria and tuberculosis

C. Dysentery and cholera      D. Cholera and tuberculosis

21. The pressure in fluids

- A. acts differently in all directions
- B. acts upwards at any point
- C. decreases with depth
- D. increases with depth

22. Which of the following heavenly bodies is a star?

- A. Jupiter    B. Moon    C. Sun    D. Venus

23. Which of the following organisms is an endoparasite?

- A. Fleas    B. Louse    C. Tapeworm    D. Tick

24. The part of the plant where pollination occurs is the

- A. flowers    B. leaves    C. roots    D. stems

25. Which of the following substances is capable of neutralizing an acid?

- A. Vinegar                      B. water  
C. Sodium chloride      D. Sodium hydroxide

26. An example of inorganic fertilizer is

- A. compost
- B. debris
- C. NPK
- D. Animal droppings

27. An example of a derived quantity is

- A. length    B. mass    C. time    D. velocity

28. A structure in the human reproductive system which stores sperms temporarily is the

- A. Epididymis    B. penis    C. scrotum    D. vulva

29. Which of the following statements about diffusion is/are **correct**?

- I. It involves the movement of water molecules only
- II. It occurs in both gases and liquids
- III. It involves a semi-permeable membrane

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

30. A farming system which requires at least three years programme is

- A. mixed cropping    B. crop rotation    C. organic farming    D. mixed cropping

31. The component of a living cell responsible for respiration is

A. chloroplast    B. mitochondrion    C. nucleus    D. vacuole

32. Which of the following statements about a second-class lever is **correct**? The

- A. pivot is between the load and the effort
- B. pivot and the load are at the same position
- C. load is between the effort and the pivot
- D. effort is between the load and the pivot

33. One advantage of soft water over hard water is that soft water

- A. has a pleasant taste    B. can prevent heart diseases
- C. does not waste soap    D. forms scales in kettles

34. The gas produced when glucose is oxidized during aerobic respiration is

- A. Hydrogen    B. Nitrogen    C. Oxygen    D. Carbon dioxide

35. The systematic name for  $N_2O$  is

- A. Nitrogen (I) oxide    B. Nitrogen (II) oxide
- C. Nitrogen (III) oxide    D. Nitrogen (IV) oxide

36. A husbandry practice which involves the removal of unwanted plant parts is known as

- A. Mulching    B. Pruning
- C. Thinning    D. Pricking out

37. The number of p-n junctions in a transistor is

- A. 1    B. 2    C. 3    D. 4

38. Fruit dispersed by wind

- A. have hairs    B. are sticky
- C. are succulent    D. have hooks

39. Substances that burn living tissues when they come into contact with these tissues are considered

- A. Corrosive    B. Flammable    C. Irritant    D. Toxic

40. The function of the platelets in the circulatory system of humans is to

- A. Transport oxygen
- B. Transport carbon dioxide
- C. Clot the blood
- D. Defend the body

INTEGRATED SCIENCE

MARKING SCHEME

PAPER 2

SECTION A [TEST OF PRACTICALS] 40MARKS

QUESTION 1

- (a) (i) method of making a magnet/magnetization of a magnet-----**2marks, correct to score**  
(ii) stroking /single stroking -----**1mark, correct spellings to score**  
(iii) the end to C is the South pole and the end to D is the North pole of the magnet ---1mark  
(iv) (1) dip the ends of the bar CD into iron fillings if the iron filling cling to the bar, then it is a magnet  
(2) suspends the bar CD horizontally at its midpoint, the bar CD will settle in the North-south direction  
(3) suspend the bar freely at its midpoint, one pole brought at a time to the ends C and D will show both attraction and repulsion for both ends-----**3marks, any 1 , correct to score**  
(v) (1) the magnet should be drawn along the bar CD in only one direction  
(2) the magnet should be lifted way off the bar CD at the end of each stroke---**any1, 1mark**  
(vi) induction, electromagnetism or the use of electricity -----**2marks, 1mark each correct spellings to score**
- (b) (i) A.....Moisture(water)  
B.....air(oxygen)  
C.....warmth(suitable temperature)  
D.....all conditions suitable for germination are present, no condition is absent  
**[3marks, 1 mark for each, correct spellings to score]**
- (ii) D is the main experiment/experimental group.....**1mark**  
(iii) (α) prevention of air from entering the test tube.....**2marks**  
(β) regulate the warmth/temperature of the test tube.....**2marks**  
(γ) absorb water/moisture in the test tube.....**2marks**
- (c) (i) I -----thread  
II----- muslin bag/bag  
III-----cork  
IV-----Conical flask-----**4marks, 1mark each , correct spellings to score**  
(ii) to prevent air from escaping or entering the conical flask-----**1mark, correct to score**  
(iii) A—to show the presence of living organisms in soil/main experiment  
B--control experiment -----**4marks, 2marks each, correct to score**  
(iv) the lime water will turns milky -----**1 mark, correct to score**  
(v) to check soil micro- organisms\_ -----**1mark**
- (d) (i) I-----funnel  
II-----evaporating dish  
III-----Beaker  
IV -----retort stand and clamp/retort stand-----**4marks, correct spellings to score, 1 each**  
(ii) A-----filtration and decantation  
B-----evaporation  
C-----separation by funnel -----**3marks, 1 mark each, correct spellings to score**  
(iii) set-up C (separation by funnel)-----1 mark, correct to score  
(iv) set-up A (filtration)-----1 mark, correct to score  
(v) set-up B(Evaporation)-----1mark, correct to score

## SECTION B

### QUESTION 2

- (a) (i)  $\alpha$ . Rusting -----chemical change  
     $\beta$ ) expansion of copper-----physical change  
     $\gamma$ ) filtration-----physical change  
     $\delta$ ) burning -----chemical change.....4marks, correct to score, 1 mark each  
    (ii) the chemical change new substances are formed , it is irreversible  
        The physical change is reversible, new substances are formed.....1mark, ½ each
- (b) (i) (1) light emitting diode(LED)  
    (2) P-N junction diode  
    (3) resistors  
    (4) transistors  
    (5) capacitors  
    (6) etc-----**any three, 3marks, 1mark each, correct spellings to score**
- (ii) (1) light emitting diode (LED) converts electrical energy into light energy in the circuit  
        (2) P-N Junction diode allows current to flow in only one direction  
        (3) resistors oppose flow of electrical current through a circuit  
        (4) transistors are use as amplifier or switch in a circuit  
        (5) capacitors store charges or energy  
        (6) etc-----**any 2 points, 2marks, 1mark each correct to score**
- (c) Vegetable crop is any edible plant grown for food and edible parts such us leaves, flower, buds and fruits eaten fresh or semi-cooked -----**2marks, correct to score**
- (d)(i) Infectious disease is a disease that is passed on or spread or transmitted from an infected person to a healthy person through body contact-----**2marks, correct to score**
- (ii) tuberculosis, chicken pox, cerebrospinal meningitis , HIV/AIDS, Whooping cough, measles, hepatitis, influenza, yellow fever, etc.-----**any one, 1mark, correct spelling to score**

### QUESTION 3

- (a) (i) thickness of soil materials  
    (ii) soil texture  
    (iii) soil structure  
    (iv) soil colour  
    (v) mineral content of the soil  
    (vi) soil organic matter content  
    (vii) etc-----**any three, 3marks 1 mark each, correct spellings to score**
- (b) (i) distillation  
    (ii) filtration  
    (iii) evaporation-----**3marks, 1 mark each, correct spellings to score**
- (c) (i) liver emulsifies/breaks fats and oils during digestion-----1mark, correct to score  
    (ii) (a) ovum/egg  
         $\beta$ ) pollen grains  
         $\gamma$ ) sperm.....**3marks, 1mark each**
- (d) (i) capacitors store charges or energy-----2marks, correct to score

- (ii) electrical conductors are materials that allow electricity to pass through-----2mark, correct to score
- (iii) (i) iron in bulk  
 (ii) putting off switch after use  
 (iii) putting of light when not in use  
 (iv) using energy saving bulb  
 (v) etc-----any point, 1mark correct to score

#### QUESTION 4

- (a) (i) (1) it is made up of a emitter, a base and collector  
 (2) the emitter junction is forward biased  
 (3) the collector junction is reversed biased  
 (4) input signal at the emitter-base section can be amplified at the collector-base region  
 (5) etc. -----any two points, 2marks, 1 mark each, correct to score
- (ii) (1) it is used as an amplifier  
 (2) it is used as a switch  
 (3) it is used as a voltage  
 (4) for rectification  
 (5) etc-----**any two, 2marks, 1mark each, correct to score**
- (b) (i)(1) dead plant  
 (2) green manure  
 (3) crop residues  
 (4) dead spoil micro-organisms  
 (5) dead macro organisms  
 (6) farmyard manure
- (i) (1) cover cropping  
 (2) mulching  
 (3) bush fallowing  
 (4) green manuring  
 (5) etc-----**any 2, 2marks, 1mark each, correct to score**
- (c) (i) ( ) protons and neutrons-----**1 mark, ½ mark each**  
 ( ) electrons-----**1mark-----correct spellings to score**
- (ii) the number of protons are equal to the number of electrons hence the negative charge on electrons balances the positive on protons-----1mark
- (d)(i) (1) it helps in digestion  
 (2) it regulates body temperature  
 (3) it helps in circulation in the body  
 (4) it transports materials in and out of the cell of the body  
 (5) it carries away waste substances from the body  
 (6) etc-----**any 2 points, 2marks, 1mark each**
- (ii) Glucose + oxygen → carbon dioxide + water + energy -----2marks

#### QUESTION 5

- (a) Live-----brown for connection  
 Neutral -----blue colour  
 Earth -----yellow and green-----**3marks, 1mark each, correct spellings to score**
- (b) (i) the type of farm produce to be raised  
 (ii) crops cultivated  
 (iii) difference in soil type in places  
 (iv) difference in climatic conditions  
 (v) availability of land for cultivation

(vi) availability of water to the farm  
(vii) etc.-----**any 4 points, 4marks, 1 mark each**

- (c) (i) egg, larvae, pupae, adult-----any two, 2 marks, 1 mark each, correct spellings  
(ii) flowering, pollination, fertilization, fruit/seed formation, seed germination, seedling, planting-----any 2, 2 marks, 1 mark each correct spellings
- (d) (i) the arrangement of oxygen on the electronic configuration will be  $K(2):L(6)$  which requires extra 2 electrons from the outermost shell and forms negatively ions called oxide.-----**2marks**  
(ii) (α) cassava  
(β) organic matter, cow dung, poultry waste, human excreta, crop residue---**2marks, 1mark each.**

### QUESTION 6

- (a) (i) convection is the transfer of heat in fluids  
(ii) radiation is the transfer of heat in in a vacuum-----**3marks, 1 ½ marks each, correct to score**
- (b) (i) (α) (1) it helps in germination of crops  
(2) it helps to keep soil micro-organisms active to improve fertility of the soil  
(3) it regulate the pH of the soil  
(4) it helps in aeration of the soil  
(5) etc.-----**2marks, any 2 points, 1mark each**
- (β) light helps in photosynthesis-----**1mark**
- (ii) changes in whether helps farmer to prepare and harvest the crops. During dry season farmer prepare their land and plant during wet season. They also harvest in dry season.-----**2marks**
- (c) (i) (α) bronze for making bells, medals, statues, etc-----**1mark**  
(β) steel: for making car parts, ships and machine parts  
(ii) this is done because the solute tends to separate from the solvent and settles at the bottom of the containing vessel. Shaking the bottle makes the mixture uniform and even.-----**2marks, correct to score**
- (d) (i) afforestation  
(ii) enforcement of environmental laws  
(iii) illegal mining must be stopped  
(v) illegal hunting must be checked  
(vi) using clean fuels such as gas  
(vii) etc-----**any 3 points, 3marks**

**PAPER 1[40MARKS]**

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

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[100 marks]

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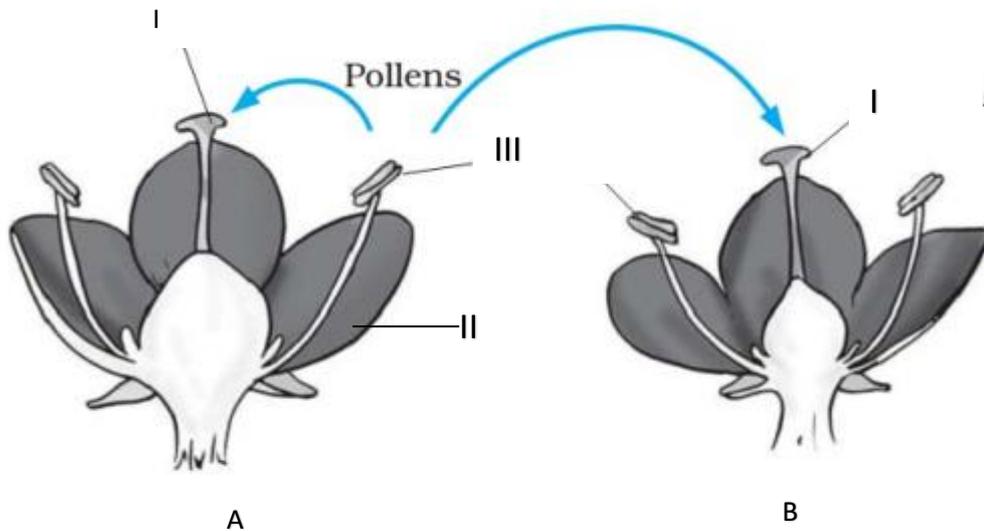
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Credit will be given for clarity of expression and orderly presentation of material.

SECTION A  
[40 marks]

Answer **all** of Question 1.

1. (a) Fig. A and Fig. B are illustrations of some natural processes. Study them carefully and answer the questions that follow.



- (i) What natural process is illustrated in fig. A and fig. B above? [2marks]  
(ii) What does fig. A represent? Explain your answer [2mark]  
(iii) What does fig. B represent? Explain your answer [2mark]  
(iv) Name the parts labelled I, II and III [3marks]  
(v) State the main function III [1 mark]

(b) The following activities were carried out on three samples of water labelled K, L and M. Study the activities carefully and answer the questions that follow.

ACTIVITIES

- I. Each of the samples of water was shaken with soap and only sample M easily formed lather with the soap.  
II. Next each of the samples was boiled, cooled and then shaken with soap. Samples L and M formed lather easily with the soap.  
III. Washing soda ( $\text{Na}_2\text{CO}_3$ ) was dissolved in each sample of water and then shaken with soap. All the samples easily formed lather with soap

- (i) From the above activities, which of the samples of water is:  
( $\alpha$ ) permanently hard water;  
( $\beta$ ) temporary hard water;  
( $\gamma$ ) soft water.

[3 marks]

(ii) State **two** other methods of softening hard water.

[2 marks]

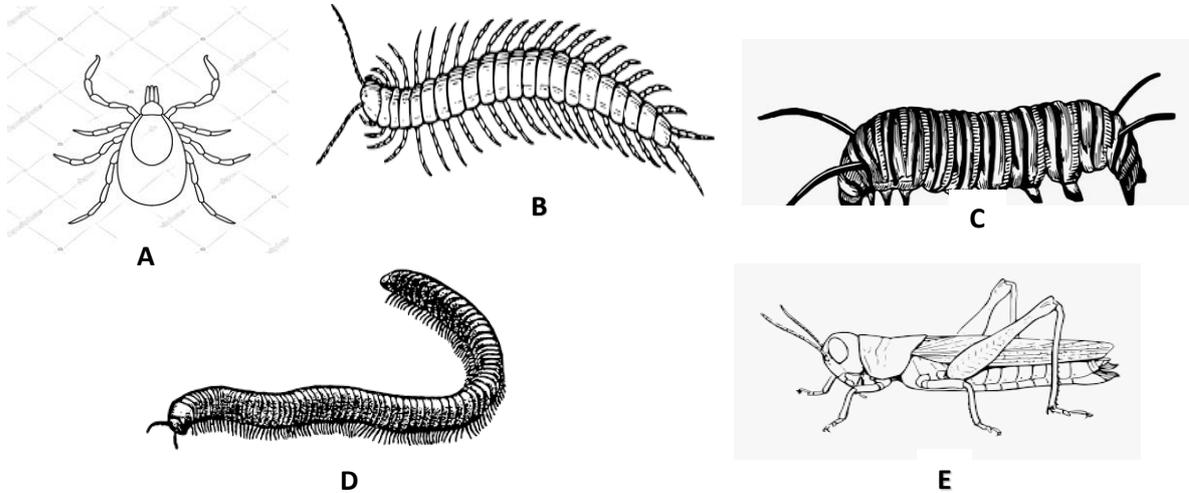
(iii) State **two** uses of water in agriculture.

[2 marks]

(iv) State **three** physical properties of water.

[3 marks]

(c) The diagrams organisms. *Study the figure carefully and answer the questions that follow.*



(i) Name organisms labelled A, B, C, D, E

[ 2 ½ mark]

(ii) Which of the organisms are considered soil organisms

[2 marks]

(iii) Which of the organisms are considered to be pests and parasites

[3 mark]

(iv) State one function of organism D

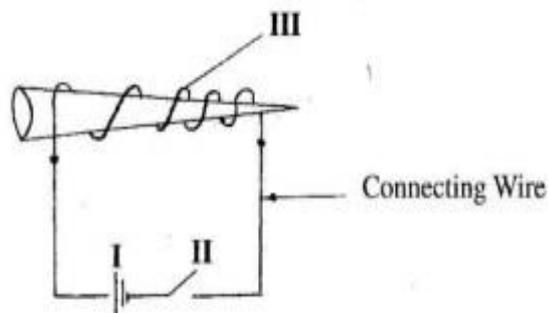
[1mark]

(v) State three effects of organism A on farm animals

[1 ½ mark]

d. The diagram below shows the electrical method of magnetizing a nail.

*Study the diagram and use it to answer the questions that follow.*



(i) Give the names of the parts of the circuit labelled I, II and III

[3marks]

(ii) List two substances that can be made into a magnet.

[2marks]

(iii) State two other methods of making magnets.

[2marks]

(iv) Name one material that is used in making an electrical wire

[1mark]

(v) Give two properties of the material you named in (iv) which makes it useful as a wire.

[2marks]

### SECTION B [60 marks]

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

2. (a)(i) Differentiate between hard water and soft water

[2 marks]

(ii) State one advantage of hard water

[1 mark]

(b) (i) What is adaptation?

[2 marks]

(ii) State **two** adaptations of a fish

[2 marks]

- (c) State four practical application of pressure [4 marks]
- (d) (i) What are cultural practices? [2 marks]  
(ii) Give **one** function **each** of the following cultural practices:  
(α) mulching; [1 mark]  
(β) pruning. [1 mark]
3. (a) State the function of the following in diet:  
(i) vitamins; [1 mark]  
(ii) water ; [1 mark]  
(iii) roughage [1 mark]
- (b) State **four** safety precautions to be observed at the laboratory [4marks]
- (c) Distinguish between the following terms in soil,  
(i) soil structure and soil texture; [2 marks]  
(ii) soil texture and soil porosity. [2 marks]
- (d) Explain the terms:  
(i) potential energy [2 marks]  
(ii) kinetic energy [2 marks]
4. (a) Mention three functions of soil living organisms [3 marks]  
(b) (i) What is a transistor? [2 marks]  
(ii) State one of the functions of a transistor [1 mark]
- (c) State four functions of the human blood [4 marks]
- (d) (i) Define corrosion of a metal [1 marks]  
(ii) Explain the reason why aluminum resist corrosion [2marks]
5. (a) (i) Explain **briefly** what is meant by the term friction. [2 marks]  
(ii) Give three reasons for studying friction [3marks]
- (b) (i) What is *stirring in crop production*? [2 marks]  
(ii) State **two** reasons for stirring in crop production [2 marks]
- (c) (i) Define the term respiration [2 marks]  
(ii) State the main reason for respiration [1 mark]
- (d) Sodium chloride is prepared by the reaction between dilute hydrochloric acid sodium hydroxide  
(i) Write a balanced equation for the reaction [2marks]  
(ii) What is the name given to this reaction? [1 mark]
6. (a) (i) Complete the following word equations:  
(α) Metal + dilute acid → salt + .....
- (β) Sodium + water → ..... + .....
- (ii) State **two** physical properties of alloys [3 marks]  
[2 marks]
- (b) (i) What is meant by the term germination? [2 marks]  
(ii) Explain the role of temperature in germination [2 marks]
- (c) (i) what is mixed farming? [2 marks]  
(ii) State **two** ways in which mixed farming is important [2 marks]
- (d) List two of the modes of heat transfer [2marks]

- The S.I for density is
  - $\text{ms}^{-1}$
  - $\text{ms}^{-2}$
  - $\text{kg m}^{-3}$
  - $\text{m}^3\text{kg}^{-1}$
- The centre of the solar system is the\_\_\_\_
  - sun
  - moon
  - earth
  - satellite
- When a piece of iron rod is brought near a permanent magnet for a while it becomes magnetized by
  - Stroking method
  - Electrical method
  - Friction
  - Induction
- Which of the following statements about an opaque object is correct? An opaque object
  - Allows light to pass through it partially
  - Allows light to pass through it fully
  - Forms a shadow
  - Does not form a shadow
- The process by which solid directly changes into gas is
  - solidification
  - evaporation
  - sublimation
  - condensation
- The instrument used to measure current in an electric circuit is the
  - Ammeter
  - Photometer
  - Thermometer
  - voltmeter
- An example of a source of energy which is non-renewable is
  - Petroleum
  - Solar
  - Tide
  - wind
- Which of the following substances can rust?
  - Aluminum
  - Bauxite
  - Copper
  - steel
- Energy stored in food is referred to as
  - Chemical energy
  - Heat energy
  - Solar energy
  - Kinetic energy
- Which of the following is a factor necessary for photosynthesis?
  - Water
  - oxygen
  - carbon dioxide

- D. salt
11. The mole is the S.I. unit of
- A. Amount of substance
  - B. Luminous intensity
  - C. Temperature
  - D. Mass of substance
12. Flowers with brightly coloured petals
- A. promote the development of ovules
  - B. induce the production of large fruits
  - C. aid pollination by animals
  - D. accelerate ripening of fruits
13. Immunization of children involves administering into the body small quantities of
- A. antigen
  - B. antibodies
  - C. red blood cells
  - D. white blood cells
14. An ecosystem can best be described as a
- A. Diagram showing a complex food relationship
  - B. Complete ecological unit that can be studied
  - C. Place where carnivores and omnivores live
  - D. Study of living things and their environment
15. Which of the following best defines temperature?
- A. Heat energy of a place
  - B. Degree of hotness of a place
  - C. The energy emitted by a hot body
  - D. Measure of hotness or coldness of body
16. The importance of ventilation is to .....
- A. Dry up water bodies
  - B. Ensure rainfall
  - C. Bring about draught
  - D. Introduce fresh air into rooms
17. Which is the original source of the energy which flows through a food chain?
- A. Carbon dioxide
  - B. Glucose
  - C. Oxygen
  - D. Sunlight
18. Water was added to a quantity of soil and the mixture shaken and filtered. When red litmus solution was added to the filtrate, the filtrate turned blue. The result shows that the soil
- A. Acidic
  - B. Alkaline
  - C. Clayey
  - D. Neutral
19. Which one of the following elements is needed by plants in small quantities for their ultimate growth?
- A. Application of inorganic fertilizer
  - B. Application of compost
  - C. Crop removal
  - D. Cover cropping
20. All the following activities promote soil conservation except

- A. Growing of cover-crops
  - B. Practicing land rotation
  - C. Over-cropping
  - D. Erection of wind breaks
21. The most effective method of reducing erosion on hilly lands is by
- A. Terracing
  - B. Applying organic manure
  - C. Creating wind breaks
  - D. Erection of barriers
22. Acidity of soil may be reduced by
- A. Growing legumes on the soil
  - B. Liming the soil
  - C. Adding manure
  - D. Applying NPK
23. During the purification of water, alum is added to the sedimentation tank to
- A. Soften hard water
  - B. Kill germs in the water
  - C. Give the water good taste
  - D. Coagulate the fine particles in water
24. Hard water can be softened by
- A. Boiling
  - B. Adding alum
  - C. Chlorination
  - D. Changing colour
25. Chlorine is used in water treatment to
- A. Kill microbes
  - B. Kill weeds
  - C. Prevent growth of algae
  - D. Coagulate fine particles in the water
26. Fertilization in humans usually occurs in the
- A. Ovary
  - B. Oviduct
  - C. Uterus
  - D. Vagina
27. The scrotum of a human is located externally because
- A. It will have limited space in the abdomen
  - B. It will take too much space in the abdomen
  - C. The temperature for sperm production should be higher than body temperature
  - D. The temperature for sperm production should be lower than the body temperature
28. Which of the following is not a source of current electricity?
- A. Dynamo
  - B. Battery
  - C. Solar panel
  - D. Transformer
29. The colour code for live wire is.....
- A. Brown
  - B. Blue
  - C. Green
  - D. Yellow

30. The chemical equation below represents  $C_6H_{12}O \rightarrow C_2H_5OH + CO_2 + \text{energy}$
- A. Aerobic respiration
  - B. Anaerobic respiration
  - C. Biological respiration
  - D. Cell respiration
31. The main process by which living things release energy from food is known as
- A. Assimilation
  - B. Digestion
  - C. Oxidation
  - D. Fermentation
32. A feature of anaerobic respiration that differentiates it from aerobic respiration is the
- A. Production of a lot of energy
  - B. Requirement of oxygen
  - C. Occurrence in the cytoplasm
  - D. Production of carbon dioxide and water as by-products
33. Anaerobic respiration can be employed industry for the
- A. Brewing of beer
  - B. Manufacturing of linen
  - C. Gas welding
  - D. Making of beads
34. Goiter is caused by the deficiency of:
- A. Calcium
  - B. Iodine
  - C. Iron
  - D. Vitamin C
35. In order to prevent rickets, one must take in diets rich in
- A. Calcium and vitamin D
  - B. Calcium and vitamin A
  - C. Magnesium and vitamin C
  - D. Phosphorus and vitamin
36. Which of the following practices is not a principle of crop rotation?
- A. Legumes should be added to the rotation programme
  - B. Deep rooted crops should be followed by shallow rooted crops
  - C. Crops that are closely related should follow each other
  - D. Fallow period should be allowed during the time of rotation
37. The relative proportion of sand, silt and clay in a given sample of soil is soil
- A. Profile
  - B. Porosity
  - C. Structure
  - D. texture
38. The first factor to be considered when deciding to cultivate crop is
- A. Cultural practices
  - B. Selection of land
  - C. Harvesting
  - D. Method of propagation
39. The removal of the top soil may be caused by
- A. Afforestation
  - B. Re-planting of trees

- C. Watering of crops
  - D. Overgrazing by farm animals
40. The main reason for dispersal of seeds and fruits is
- A. localization of plants
  - B. production of better plants
  - C. germination of seeds
  - D. food for animals

# INTEGRATED SCIENCE

## MARKING SCHEME

### PAPER 2

#### SECTION A [TEST OF PRACTICALS] 40MARKS

#### QUESTION 1

#### QUESTION 1a

I. Pollination

(2marks, correct to score)

II. Self – pollination: There is the transfer of pollen grains from the anther of the flower A to the stigma of the flower A.

(2marks, correct to score)

III. Cross – pollination is the transfer of pollen grains from the anther of flower A of one plant to the stigma of a flower on different plant.

(2marks, correct to score)

- Stigma
- Pollen grains (Pollen)
- Anther

(3marks, correct to score)

V. Anther (III) produces pollen grains.

(1mark, correct to score)

#### QUESTION 1b

- K
- L
- M

(1 mark)

(1 mark)

(1 mark)

II. 1. Distillation

2. Treatment with soft water softeners

3. Ion exchange (de – ionisation)

(Any 2, 2marks, 1 mark each)

III. 1. Irrigation

2. Spraying chemicals

3. Crop growth

(Any 2, 2marks, 1 mark each)

IV. 1. Water is colourless

2. Water is odourless

3. Water freezes at 0°C

4. Water boils at 100°C

5. Water expands y heating

6. Water is tasteless

(Any 3 point, 3Marks, 1mark)

**QUESTION 1c**

I) A - Tick

B - Centripede

C - Cartapiller

D - Millipede

E - Grasshopper

(2<sup>1</sup>/<sub>2</sub>marks, <sup>1</sup>/<sub>2</sub> mark each correct to score)

II). A - Centipede

D - Millipede

(2marks, 1mark each correct to score)

III. Pets - C, E

Parasite - A

(3marks, 1 mark each, correct to score)

IV. D (millipede) improve soil structure

D (millipede) improve soil fertility

D (millipede) improve soil aeration

(1mark, any one point)

V. 1. It causes pre-mature death of farm animals

2. It causes stunted growth

3. It causes still birth

4. It causes weight loss

5. It causes general weakness

(1<sup>1</sup>/<sub>2</sub>mark, <sup>1</sup>/<sub>2</sub> mark each correct to score)

**QUESTION 1d**

(I) I - Cell

II - Key or switch

III - Solenoid or coil

II). Substance: Iron (Fe), Steel, Nickel (N<sub>1</sub>), Cobalt (co) (Any 2 point, 1 mark each, 2marks)

III.) Single stroking, Double stroking, Induction (2marks, 1 mark each, 2 points)

IV). Copper, Aluminum, Steel, Iron, Silver (Any one, 1 mark)

V). 1. Ductile

2. Malleable

3. Low resistivity

4. High tensile strength

(2 marks, 1 mark each, 2 points)

## PART 2

### ANSWER FOUR QUESTIONS

#### QUESTION 2

a. I. Hard water does not lather easily with soap whilst soft water lathers easily with soap.

(Correct to score, 2 marks; incorrect to score)

II. 1. Use in brewery industries

2. Good for strong bones and teeth

3. Helps in clotting of blood

4. It does not lead to poisoning

(1 point, 1 mark, correct to score)

b. (i) Adaptation is the means by which an organism lives successfully in a particular habitat.

(ii) 1. It has a lateral line for detecting vibrations

2. It is a stream-lined body

3. It has gills for respiration

4. It has fins for movement

(Any, 1 mark each)

c. I. Water pumps operate on the principle of fluid pressure.

II. Bicycle pump for inflating tyres works on the principle of fluid pressure

III. Drinking straw for sucking juices

IV. Hydrate machine

(4 marks)

d. I. Cultural practices are activities performed on the farm after transplanting

(2 marks)

II. (α) 1. To conserve moisture in the soil

2. To check weeds

3. To check erosion

4. To add humus to the soil

(Any 1 point, 1 mark)

(β) 1. To prevent the spread of diseases

2. To promote air circulation

3. To encourage penetration of light

(Any 1 point, 1 mark)

#### QUESTIONS 3

a. (i) 1. Vitamins are for the maintenance of normal health, fight diseases

(ii) 1. Transport food substances

2. Protects the cells of the body

3.It regulates body temperature (any 1 point, 1mark)

(iii) Roughage

1. Prevention of constipation
2. It prevents colon cancer
3. It prevents obesity

(Any 1 point, 1 mark)

(b) 1.Protective clothing like shoes should be worn always to prevent objects like broken glasses, from hurting us.

2. Drinking or eating food is prohibited

3. When performing experiments involving dilution of acids, one should always add acid to water but not water to acid

4. Goggles should be worn to prevent chemical splash

c.(i). Soil structure describe how the soil particles are arranged or packed into groups or aggregates while soil texture is the relative proportions of gravels, sand and silt clay fraction in a given sample of soil.

(2marks, correct to score)

(ii) Soil texture is the native proportions of gravels, sand, silt and clay fractions in a given sample of soil while soil porosity refers to the amount of pores, or open space between soil particles (2marks, correct to score)

(d)I. Potential energy is the energy which a body has by virtue of its position. (2marks, correct to score)

II. kinetic is the energy which a moving body has by virtue of its motion (2marks, correct to score)

#### QUESTION 4

a. I. They help improve soil structure

II. They help improve soil drainage

III. They help improve soil fertility (3marks, correct to score)

b. (i) A transistor is a small low-powered solid-state electronic device consisting of a semi- conductor and at least three electrodes called the emitted (E), Base and collector. (any other definition) 2marks

(ii) . 1. Transistors are used in circuits to amplify a smaller voltage into a large one.

2. It can be used as an amplifier. (any 1 point, 1mark)

c. I. Blood regulates body temperature by distributing heat produced in muscles, like the liver uniformly.

II. Blood helps to maintain the level of water in the body

II. Blood helps to protect the body when there is a cut by forming clot.

III. In excretion blood transport wasted products such as urea from the tissue to the excretory organs to be removed.

IV. Blood helps to transport dissolved food substance to all the parts of the body

V. Etc. (4points, 4marks, correct to score)

d. (I)Corrosion of metals is the wearing away of the metal by the action of chemicals such as acids, alkalis, water, oxygen, salt water (1mark, correct to score)

II. When aluminium reacts with oxygen and water, a thin, continuous transparent layer of aluminium oxide forms on the surface of the metal. This film of oxide protects fresh part of the aluminium metal from further rapid corrosion hence, protecting it from rusting. (2marks)

## QUESTION 5

- a. I. Friction refers to the force that opposes the sliding or the movement of two different surfaces in contact with each other. (2marks, correct to score)  
II.1. It enables moving vehicles stop
2. It enables part of a machine to move
  3. It enables people to move about without falling
  4. etc. (3points, 3marks, any other points)
- b. (i) Stirring is the practice of ensuring enough supply of air and water into the soil. This is done by digging up the soil using a hand fork or a foot fork or cutlass depending on the type of crop cultivated to loosen up the soil. (2marks, correct to score)  
(ii) 1 It allows free movement of air in the soil.
2. It improves soil structure
  3. It helps the soil to retain water for plant use
  4. any other answers (2points, 2marks, correct to score)
- c. I. Respiration is the process by which oxygen is taken into the body to breakdown food and replace worn out cell parts, maintenance of body temperature and a lot of other metabolic activities (2marks, correct to score)  
II. to release/produce energy from food (1marks, correct to score)
- d. (I)  $N_aOH + HCL \rightarrow N_aCl + H_2O$  (2marks, correct to score)  
(II) Neutralisation reaction (1marks, correct to score)

## QUESTION 6

- a. I ( $\alpha$ ). salt + Hydrogen Gas  
( $\beta$ ) Sodium hydroxide + Hydrogen gas [1 ½ marks each, 3marks]
- II. 1. They are harder than pure metals  
2. They have high tensile strength than pure metals  
3. They are resistance to rusting [any 2 points, 1mark each, 2marks]
- b. I. Germination is the development of a seed to form a seedling. [2marks]  
II. to regulate moisture concentration, enzyme activities [2marks]
- c. I. This is the type of farming in which the farmer grows crops and rears animals on the same piece of land at the same time [2marks].  
II.
1. The farmer can generate income at any time, either through the sale of farm produce or animals and their products.
  2. Land is fully utilized

3. Animal feed may be used as manure for crops

4. Crops may be used as feed for animals

[any, 2points, 2marks, 1 mark each]

d.

i. Conduction

ii. Radiation

iii. Convection

[any 2 points, 2marks]

PAPER 1 [40marks]

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

## DAS B.E.C.E PERFORMANCE BOOSTER

### BASIC EDUCATION CERTIFICATE MOCK

## INTEGRATED SCIENCE

2 hours

[100 marks]

Write your **name** and **index number** in **ink** in the spaces provided above

This booklet consists of two papers. Paper 2 is in two sections: **A** and **B**. Answer all questions section **A** and four questions in section **B**.

Answer paper 2 on the question paper.

Paper 2 will last 1 hr. 15 minutes after which the drawing sheets will be collected

Answer paper 1 on your objective test answer sheet

Do not start paper 1 until you are told to do so. Paper 1 will last 45 minutes

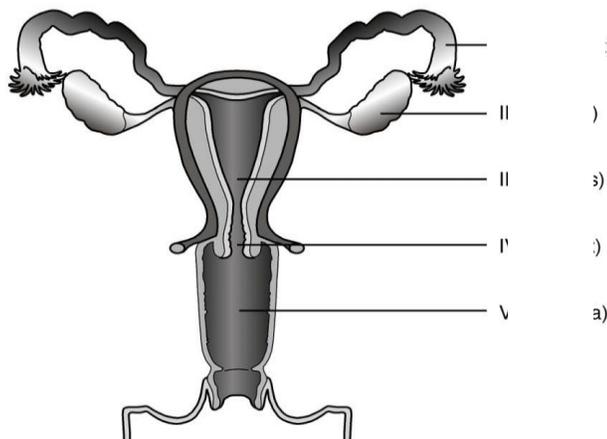
### PAPER 2 ESSAY 100 MARKS [1HOUR 15 MINUTE]

#### PART 1

#### [TEST OF PRACTICAL] 40 MARKS

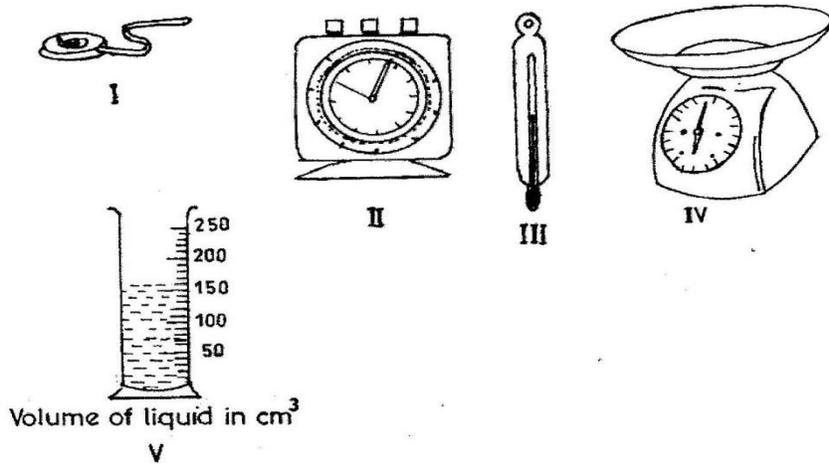
#### Answer all questions in question 1

1(a). The diagram represents a system. Study it and answer the questions on it.



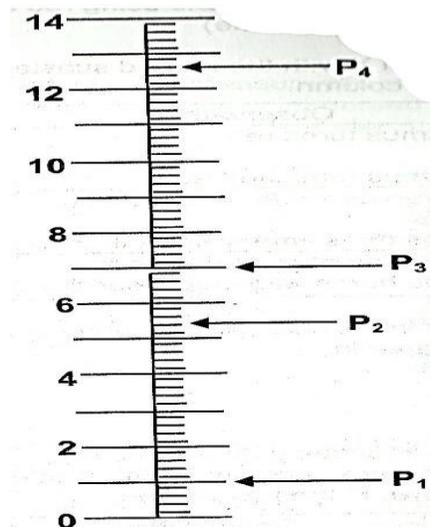
- i. What does the diagram represents and explain it 3 marks
- ii. Name the parts I to V 2 ½ marks
- iii. State the functions of I to V 2 ½ marks
- iv. Which part does fertilization takes place 1 mark
- v. Which part does implantation of the embryo takes place 1 mark

(b) The diagrams below show some instruments used in the laboratory. Study the diagrams carefully and answer the questions that follow



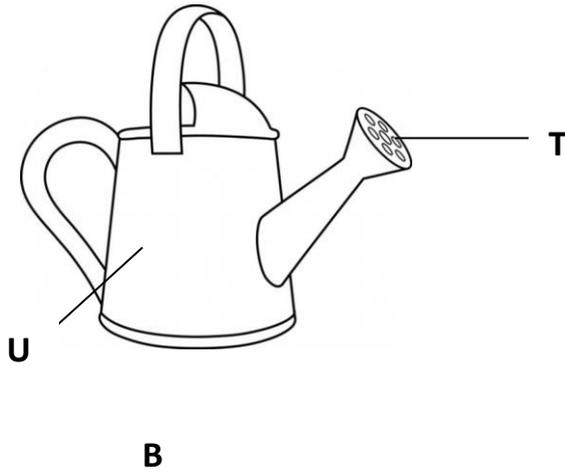
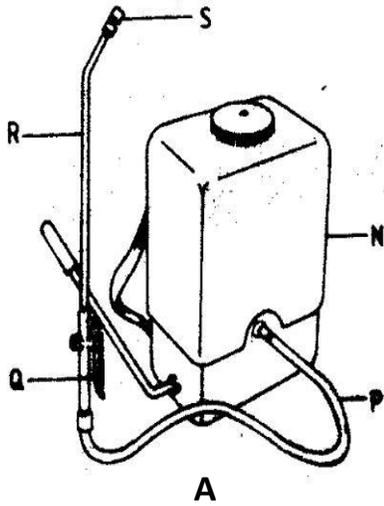
- i. Identify each of the instruments labeled I, II, III, IV and V 2 ½ marks
- ii. State one use of each of the instruments labeled I, II, III and IV 5 marks
- iii. Read and record the volume of the liquid in the instrument labeled V 2 ½ marks

(c) The graduated diagram below represents a pH scale. Answer the questions on it.



- i. Read and record each of the pH values; P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub> and P<sub>4</sub> 2marks
- ii. What does pH; P<sub>1</sub> and P<sub>2</sub> indicate. Give one examples of such liquid 2marks
- iii. What does pH; P<sub>3</sub> and P<sub>4</sub> indicate. Give one example of such liquid 2marks
- iv. Sate the observations red litmus and blue litmus paper are dipped in turns into each of the liquid 4marks

d) The diagrams below represent farm tools. Study them and answer the questions.



- |      |                                             |           |
|------|---------------------------------------------|-----------|
| i.   | Write the names of the devices A and B      | 2marks    |
| ii.  | Label the parts N, P, Q, R, S, T and U      | 3 ½ marks |
| iii. | State one use each of the two devices       | 2marks    |
| iv.  | State the use of the parts labelled Q       | 1 ½ marks |
| v.   | State one similarity between device A and B | 1 marks   |

**PART 2 [60 MARKS]**  
**Answer four questions in this section**

- 2 (a) i. Define respiration 1marks
- ii) State two differences between the types of respiration 2marks
- (b) i Differentiate between potential energy and kinetic energy 2marks
- (ii) A body of mass 100kg moves with velocity of  $8ms^{-1}$ . Calculate its kinetic energy 2marks
- (c) (i) Explain the term electronic configuration 2marks
- (ii) State two differences between protons and electrons 2marks
- (d) State four importance of soil water 4marks
3. a (i) Explain the following
- α) ecosystem
- β) adaptation
- μ) habitat 3marks
- (i) State three adaptations of a fish in its habitat 3marks
- b. State four uses of the periscope 2marks
- c (i) Differentiate between hard water and soft water 2 marks
- (ii) State two advantages of hard water over soft water 2marks
- d (i) Explain the term fertilizer application 1 marks
- (ii) List four methods of fertilizer application 2 marks
4. a. State four importance of the carbon cycle 2marks
- b. Explain the following
- (i) soil structure
- (ii) soil texture
- (iii) soil porosity
- (iv) soil capillarity 5marks
- c. (i) Define a compound 1 mark
- (ii) State three differences between a compound and a mixture 3marks
- d. (i) Define frictional force 1mark

(ii) State three applications of friction	3marks
5. a. (i) Differentiate between transpiration and photosynthesis	2marks
(ii) State three importance of photosynthesis	3marks
b. (i) Define a force	3mark
(ii) State three effects of a force	1½ marks
c. (i) List two causes of permanent hardness of water	1marks
(ii) State three ways of softening hard water	1½ marks
d. (i) Explain the term cultural practice	1mark
(ii) List four cultural practices in crop production	2marks
6 a. (i) Explain the following	
α) Biennial crops	
β) Perennial crops	2marks
(ii) List two examples each of biennial crops and perennial crops	2marks
(b) (i) What is the meaning of roughage?	2marks
(ii) State two benefits of roughage in our diet	3marks
c (i) Differentiate between pure science and applied science	2marks
(ii) State three methods of conducting scientific research	1 ½ marks
d (i) List the particulate nature of matter	1 ½ marks
(ii) Explain the reason why atoms are electrically neutral	2marks

**PAPER 1 [40 MARKS] 45 MINUTES**

1. Brass is an alloy of
  - A. iron and carbon
  - B. zinc and copper
  - C. iron and copper
  - D. copper and tin
2. An example of inorganic fertilizer is
  - A. ammonium nitrate
  - B. cow dung
  - C. farmyard manure
  - D. poultry dropping
3. The component of the human blood which transports oxygen to all parts of the body is
  - A. plasma
  - B. platelets
  - C. red blood cells
  - D. white blood cells
4. The importance of fuse in an electrical circuit is to
  - A. regulate the voltage
  - B. prevent damage to electrical appliances
  - C. alter the flow of current in the circuit
  - D. minimize the use of current
5. Which of the following step(s) is/are required in the scientific method?
  - I. Formulation of hypothesis
  - II. Identification of problem
  - III. Experimentation
  - A. I only
  - B. II only
  - C. II and III only
  - D. I, II and III
6. Which of the following food items produces amino acids as end-product of digestion?
  - A. cabbage
  - B. fish
  - C. margarine
  - D. rice
7. The process of increasing the strength of a signal using a transistor is known as
  - A. amplification
  - B. biasing
  - C. doping
  - D. switching

8. The physical arrangement of soil particles into aggregates is termed
- soil porosity
  - soil profile
  - soil structure
  - soil texture
9. The solvent which is most effective in washing bitumen from the hand is
- acid
  - alcohol
  - kerosene
  - water
10. A piece of stone could be classified as an opaque material because it
- absorbs all the light incident on it
  - does not absorb light incident on it
  - allows all the light incident on it to pass through it
  - does not allow light incident on it to pass through it
11. Fish swims in water with little resistance because it possesses
- gills
  - scales
  - caudal fins
  - streamlined body
12. Which of the following activities promote(s) rusting of iron?
- I. Air      II. Moisture      III. Oil
- I only
  - II only
  - I and II only
  - II and III only
13. The change in the volume of water when a piece of stone is dropped into it is equal to the
- density of the stone
  - mass of the stone
  - volume of the stone
  - weight of the stone
14. The second stage in the life cycle of a mosquito is the
- egg
  - imago
  - larva
  - pupa
15. Which of the following object can be attracted by a magnet?
- Copper chain
  - Gold chain
  - Steel chain
  - Aluminium spoon

16. The knowledge of soil texture is important because it
- A. influences plant population
  - B. determines the planting distance
  - C. determines the type of plant to be grown
  - D. influences the method of pest control
17. How many atoms are present in  $CaCl_2$ ?
- A. 2
  - B. 3
  - C. 4
  - D. 5
18. The transfer of heat from the bottom to the top of a beaker containing water is by
- A. absorption
  - B. conduction
  - C. convection
  - D. radiation
19. An example of chemical compound is
- A. aluminium
  - B. ammonium
  - C. oxygen
  - D. phosphorus
20. The type of human teeth used for biting food substance is
- A. canines
  - B. incisors
  - C. molars
  - D. premolars
21. An example of a third class lever is
- A. wheelbarrow
  - B. sugar tongs
  - C. pair of scissors
  - D. crowbar
22. The release of matured cells from an ovary into the fallopian tube in humans is called
- A. copulation
  - B. ejaculation
  - C. menstruation
  - D. ovulation
23. The blood vessels that carries oxygenated blood from the lungs to the heart is known as
- A. pulmonary artery
  - B. pulmonary vein
  - C. vena cava
  - D. aorta

24. An example of a plant micro-nutrient is
- A. calcium
  - B. copper
  - C. magnesium
  - D. potassium
25. What is the colour of the neutral wire in a three-pin plug?
- A. Blue
  - B. Brown
  - C. Green
  - D. Yellow
26. In the pin-hole camera, the image formed is always
- A. erect and bright
  - B. erect and blurred
  - C. inverted and real
  - D. inverted and virtual
27. The part of the flower that develops into the fruit is the
- A. ovary
  - B. ovule
  - C. stamen
  - D. style
28. The number element in the compound  $Ca(OH)_2$  is
- A. 2
  - B. 3
  - C. 4
  - D. 5
29. The reason why alum is added to water during treatment is to
- A. kill germs
  - B. give taste to water
  - C. make water colourless
  - D. make suspended particles to settle
30. Which of the following animal parasites could be controlled by hand picking?
- A. Liver fluke
  - B. Tapeworm
  - C. Tick
  - D. Roundworm
31. A stick which is partially immersed In water appears to be bent due to
- A. absorption
  - B. reflection
  - C. refraction
  - D. transmission
32. One difference between metals and non-metals is that metals
- A. have low density

- B. are not malleable
  - C. have luster
  - D. have low melting points
33. The cultivation of different crops on different plots of farmlands in a definite cycle is called
- A. land rotation
  - B. shifting cultivation
  - C. crop rotation
  - D. mixed cropping
34. Iodine deficiency in humans could result in a disorder known as
- A. diabetes
  - B. goiter
  - C. kwashiorkor
  - D. scurvy
35. A substance is termed combustible if it
- A. easily catches fire
  - B. dissolves common salt
  - C. sublimates at room temperature
  - D. boils at 100°C
36. Micro-organisms that cause diseases are collectively called
- A. bacteria
  - B. infections
  - C. pathogens
  - D. viruses
37. Which type of energy is lost when sweat evaporates from the human body?
- A. sound energy
  - B. mechanical energy
  - C. chemical energy
  - D. heat energy
38. Which of the following gases is involved in the rusting of iron?
- A. Hydrogen
  - B. Oxygen
  - C. Nitrogen
  - D. Carbon dioxide
39. The feeling of soil between fingers is used to determine the
- A. texture of the soil
  - B. drainage of the soil
  - C. capillarity of the soil
  - D. water holding capacity of the soil

40. Sodium hydroxide is an example of a base because it

- A. has sour taste
- B. has a pH less than 7
- C. turns wet blue litmus paper red
- D. turns wet red litmus paper blue**

# INTEGRATED SCIENCE MARKING SCHEME

## PAPER 2

### TEST OF PRACTICALS 40MARKS

#### QUESTION 1a

i. Female reproductive system. This system consists of various organs such as the vagina, uterus, fallopian tube, ovary, etc which makes it possible for females to reproduce/procreate.

Naming -----1mark, explanation 2marks-----3marks

ii. I – Fallopian tube

II – Ovary

III – Uterus

IV – Cervix

V – Vagina----- ½ mark each, 2 ½ marks, correct spelling to score

iii. I – It is the place where fertilization takes place/ it carries matured eggs from the ovary to the uterus.

II – It produces female gamete (sex cells) also called eggs/ova.

III – It is the place where implantation and development of embryo takes place.

IV – It serves as a link between the womb and the vagina.

V – It receives sperms during sexual intercourse/ it is the organ through a baby is born.

**½ marks each, 2 ½ mark -----correct to score**

iv. Part I fallopian tube -----1 mark, correct spellings to score

v. Part III uterus (womb) -----1 marks, correct spelling to score

### QUESTION 1(b)

(i) I – Tape measure

II – Stop watch

III - Thermometer

IV – Top pan balance/balance

V – Measuring cylinder-----**2 ½ marks, ½ mark each correct spellings to score**

ii. I – For measuring the length of objects

II – For measuring of time

III – For checking the temperature of substances/bodies

IV – For checking masses of substances

V – For measuring volume of liquids-----**5marks 1 mark each, correct to score**

iii. Volume of liquid =  $160\text{cm}^3$  -----2 ½ marks

### QUESTION 1(c)

(i) P1 =1, P2= 5.4, P3 =7, P4 =12.6 -----**2marks, ½ marks each, correct to score**

(ii) pH ; P1 and P2 are acids. Acids have pH less than 7. Hydrochloric acid, sulphuric acid, etc  
**2marks, 1 mark for indications and 1 mark for example**

(iii) Ph; P3 and P4 indicate bases. A base has ph greater 7. Sodium hydroxide, ammonia, etc  
**2marks, 1 mark for indications and 1 mark for example**

(iv) The liquid in (i) will make red litmus paper remain the same and make blue litmus paper red.  
The liquid in (iii) will turn red litmus paper blue and make blue litmus paper remain the same.-----**4marks, 2marks each**

### QUESTION 1d

(i) A-----Knack sack sprayer

B-----Watering Can-----2marks, 1mark each

ii. N – tank

P – hose

Q – trigger /regulator

R – spray gun

S – nozzles

T – rose

U – tank -----3 ½ marks, ½ mark each

iii. A---for applying chemicals like fertilizers, pesticides to crops

B---for irrigation and watering nursery beds-----2marks, 1mark each

iv. Q ---the trigger or regulator starts and stops the spraying processes-----1 ½ marks

v. Both of the devices can be used for spraying chemicals to crops as well as watering crops-----  
2marks

Both of the devices have tank to hold water

### PART 2 [60 MARKS]

2. (a) i. Respiration is the process whereby organism obtained energy from food with or without oxygen.-----1mark

ii. -----2marks, 1 mark each

<i>Anaerobic respiration</i>	<i>Aerobic respiration</i>
No oxygen is required	Oxygen is required
Less energy is produced	A lot of energy is produced
Alcohol, carbon dioxide or lactic acid are produced as by products	Carbon dioxide and water are produced as by products
Occurs in cytoplasm	Occurs in mitochondrion

(b)(i). Potential energy is possessed by stationary object whiles kinetic energy is possessed by a moving object.-----2marks, no contrast award zero

(ii) Mass of body = 100kg      Velocity =  $8ms^{-1}$

$$\text{Kinetic energy} = \frac{1}{2}mv^2$$

$$= \frac{1}{2} \times 100 \times 8$$

$$= 400 \text{ J}-----2marks, without calculations award zero$$

(c) (i) Electronic configuration is the arrangement of electrons around the shells of an atom.-----  
2marks

(ii) -----2mark, mark each

<i>Protons</i>	<i>Electrons</i>
Positively charged	Negatively charged
Located in the nucleus	Located outside the nucleus in shells
It is fixed and stationary	It is not fixed and it is mobile
Its mass is not negligible	It has a negligible mass

(d) 1. It is absorbed by plants for photosynthesis.

2. It dissolves mineral salts, which are used by plants for growth.

3. It cools plants through the process of transpiration.

4. It is used by plants to transport food substances.

5. Absorbed soil water maintains the turgidity of plants.-----any 4, 4 marks 1mark each

3. a (i)

$\alpha$ ) Ecosystem consists of different living things and their natural dwelling places/ It is a combination of a community and its environment.-----1mark

$\beta$ ) Adaptation refers to the ability of living organisms to successfully live in its habitat or environment due to the development of special body features. -----1mark

$\mu$ ) Habitat is a place where an organism lives successfully.-----1mark

(ii) 1. It possesses a streamlined body to enhance its movement in water

2. It has gills for exchange of gases (respiration)

3. It has eyes for viewing object

4. It possesses scales which protect its body from mechanical injury

5. It has gill cover which protect its gills

6. etc-----3marks, 1 mark each

b. 1. Periscope is used to look for objects behind obstacles

2. Submarines use periscope to search for oncoming warship

3. Drivers of double-decker buses also use periscope to view the upper deck.

4. They are used to observe from armoured tanks, objects that are above the armoured plate.

5. Short spectators at a football match use periscope to view the match over the heads of the tall spectators.-----any 4, 2marks ½ mark each

c. (i) Hard water does not lather easily with soap but soft water lathers easily with soap.-----2 marks

(ii) 1. Hard water has a pleasant taste

2. it prevents heart disease

3. it is good for the formation of strong bones and teeth

4. It does not cause lead poisoning -----any 2, 2marks

d. (i) Fertilizer application is the practice of supplying nutrient to crops for their continues growth as the soil losses nutrients.-----1mark

(ii) 1. Ring method

2. Broadcast method

3. Drilling method

4. Spraying

5. side dressing etc. -----any 4 for 2marks, ½ mark each

4. a.1. it provides carbon dioxide to plants for photosynthesis

2. It helps animals to get food

3. It helps in energy balance

4. It reduces sun's energy on earth

5. It helps in decay of organic matter-----any 4 for 4 marks

b. (i) Soil structure refers to the way soil binds or clumps together. It is the arrangement of individual particles into aggregate creating pore spaces of different sizes.----1mark

(ii) Soil texture refers to the relative proportion of sand, silt and clay in a given soil.-----1mark

(iii) Soil porosity refers to the size, number and arrangement of pores in the soil.-----1mark

(iv) Soil capillarity refers to the height to which water rises in a soil.-----1mark

c. (i) A compound is a substance formed from the chemical combination of two or more elements-  
1mark

(ii) -----3marks

Mixtures	Compounds
No new substance is formed	A new substance is formed
The constituent can be separated by physical means	Constituent can only be separated by chemical means
The proportions of constituents can vary	The proportions of constituents is fixed
No energy is gained or lost	Energy is usually gained or lost
Their formation is not followed by heat changes	Their formation is followed by heat changes
Has similar properties to those of the constituent substances	Has different properties from those of the constituent substances

d. (i) Frictional force is defined as the force which opposes the relative or sliding motion between two surfaces in contact.-----1mark

(ii) 1. Sharpening of tools such as cutlasses, knives and axes.

2. Nail and wood are held together by friction.

3. Friction between lorry tyres and a road allows vehicles to stop moving when brakes are applied.

4. Friction is applied when walking.

5. With friction, machine parts are able to move against each other when the machine is in operation. -----any 3 points 3 marks 1 mark each

5. a. (i) Transpiration is the by process which plants loose water during dry seasons while photosynthesis is a process which involves plants producing their own food with the help of sunlight, water and carbon dioxide.-----2marks

(ii) 1. Help plants to manufacture their own food.

2. It helps to reduce the amount of carbon dioxide in the atmosphere.

3. Oxygen is given off as a by-product which animals breathe in for cellular respiration

4. Photosynthesis makes it possible for herbivores to live by feeding on green plants.-----

3marks

b. (i) A force is defined as that which tends to change a body's state of rest or state of uniform motion in a straight line/ pull or push

(ii) 1. It can cause a body to move from rest.

2. It can bring a body to rest.

3. It can change the direction of a moving body or a body at rest.

4. It can change the speed of a moving body.

5. It can change the shape of a body.-----any 3 points, 1 ½ marks, ½ mark each

c. (i) The following ions dissolve in water to make it a hard water;

a. Magnesium ion ( $Mg^{2+}$ )

b. Calcium ion ( $Ca^{2+}$ )

c. iron ion ( $Fe^{2+}$ )-----any 2 for 1 mark

(ii) 1. By boiling                      3. Addition of washing soda

2. By distilling                      4. Deionization or ion-exchange method-----any 3, 1 ½ marks

d. (i) Cultural practice is any activity that is carried out after planting or sowing crops on the field up to the time of harvesting.-----1mark

(ii) 1. Weeding                      5. fertilizer application

2. mulching                      6. pests control-----any 4 points, 2 marks

3. watering

4. Shading

6. a (i)

a) Biennial crops are crop plants, which complete their life cycle in two seasons. Examples are carrot, cabbage and beetroot.-----1 mark

b) Perennial crops are crop plants which continue to grow from season to season or year after year. Examples are oil palm, cocoa, coffee and cashew.-----1mark

(ii) any two each ½ mark each, 2 marks

Biennial crops	Perennial crops
Carrot	Oil palm
Cabbage	Cocoa
Beetroot	Coffee
	cashew
	Coconut

b. (i) Roughage is indigestible fibrous material. One example is cellulose.-----2marks

(ii) 1. Helps in the movement of food through the gut.

2. Prevents constipation

3. Reduces the risk involved in bowel cancer.-----any 2 points, 3marks

c. (i) Pure science is the study of nature through enquire and experimentations while applied science is the study and application of two or more pure sciences.-----2marks

(ii)

1. Problem identification

2. Making hypothesis

3. Analyzing results

4. Making conclusions -----any 3, ½ mark, 1 ½ marks

d. (i) 1. atoms

2. molecules

3. ions-----3 points ½ mark , 1 ½ marks

(ii). Every atom contains sub atomic particles which are the protons, neutrons and electrons. Protons are positively charged, neutrons are neutral and electrons are negatively charged but the number of protons are always equal to the number of electrons. This makes their charges to balance each other which make every atom electrically neutral.-----2mark

PAPER 1

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

BECE BOOSTER  
INTEGRATED SCIENCE  
Essay and Objective  
2 hours

2&1

Name: .....

Index number: .....

## DAS B.E.C.E PERFORMANCE BOOSTER

### BASIC EDUCATION CERTIFICATE MOCK

INTEGRATED SCIENCE

2 hours

[100 marks]

*Write your **name** and **index number** in **ink** in the spaces provided above*

*This booklet consists of two papers. Paper 2 is in two sections: **A** and **B**. Answer all questions section A and four questions in section B.*

*Answer paper 2 on the question paper.*

*Paper 2 will last 1 hr. 15 minutes after which the drawing sheets will be collected*

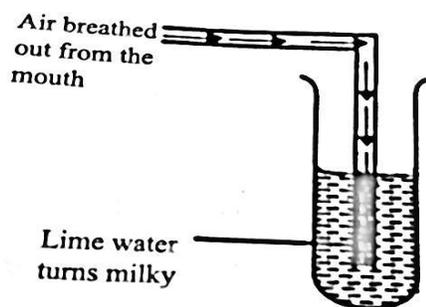
*Answer paper 1 on your objective test answer sheet*

*Do not start paper 1 until you are told to do so. Paper 1 will last 45 minutes*

**PAPER 2 ESSAY 100 MARKS (1 HOUR 15 MINUTES)**

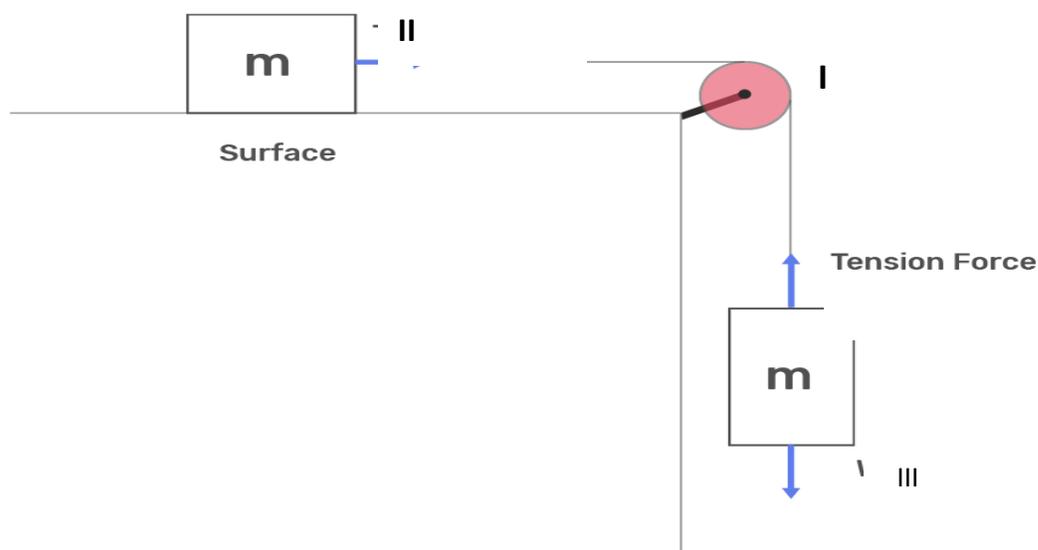
This paper is in two parts: I and II. Answer question 1 and any other 4 questions in part 2

1. (a) The set-up below shows air being breathed out through the mouth into test-tube containing lime water.



- i. Why does the lime water turn milky? 2marks
- ii. Identify the milky substance produced 2marks
- iii. Write a balanced chemical equation for the reaction 2marks
- iv. Name two other substances present in breathed-out air 2marks
- v. What is the aim of the experiment? 2marks

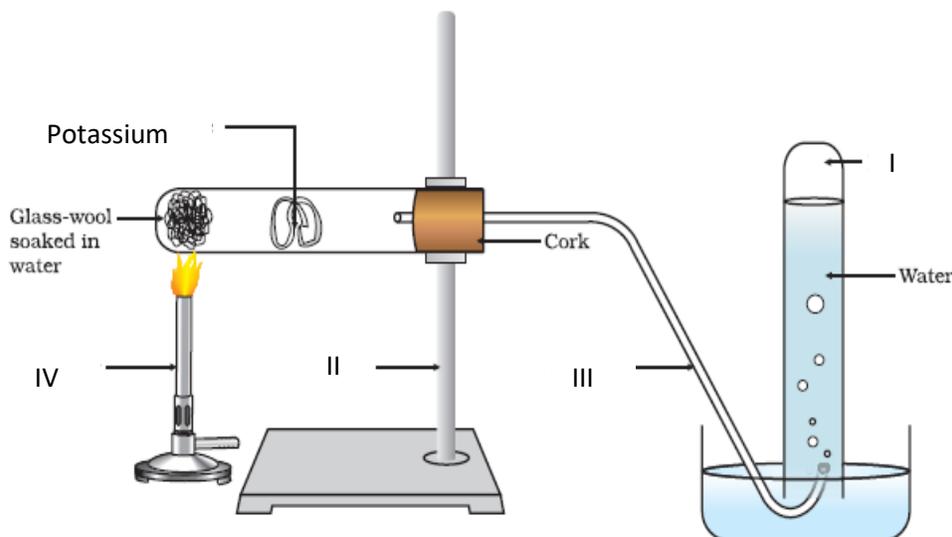
- (b) The diagram below shows a scientific experiment. Study it and answer the questions



- (i) Give the names of the parts labelled I, II and III 3marks

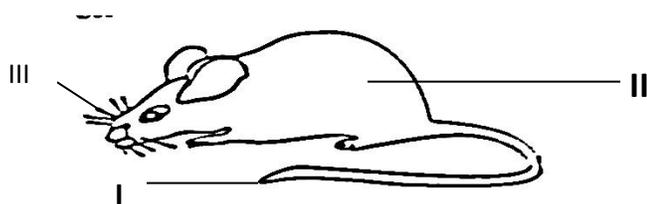
- (ii) What force acts between the surface and the object M? 2marks
- (iii) State two effects of the force in (ii) 2marks
- (iv) Explain how you can use **m** to obtain **III** 2marks
- (v) What type of machine is I? 1mark

(c) In an experiment to investigate the reactivity of potassium with water, a piece of the metal was dropped into a test tube containing water. The experimental set-up is illustrated below.



- i. Label the parts I to IV 2marks
- ii. List two metals that can be used in place of potassium 2marks
- iii. Name the gas evolved 2marks
- iv. Write word equation for the reaction 2marks
- v. Write the balance of chemical equation for the reaction 2marks

(d) Below is a diagram of a crop pest. Use it to answer the questions that follow.



- i. Name the crop pest 2marks
- ii. Name the parts I, II and III 3marks
- iii. List four crops which are attacked by the crop pest 2marks
- iv. State three methods of controlling the crop pest 3marks

## PART 2 (60 MARKS)

### ANSWER FOUR QUESTIONS IN THIS SECTION

2. (a) i. What is germination? 1 mark  
ii List three(3) conditions necessary for germination 3marks  
(b) i. Explain the meaning of soil micro-organisms 2marks  
ii. State three(3) functions of soil micro-organisms 3marks  
(c) i Briefly explain the following  
( $\alpha$ ) Mass 1 mark  
( $\beta$ ) Volume 1 mark  
ii Explain how the volume of a stone can be determined 2marks  
(d) State three (3) differences between a compound and a mixture 3marks
3. (a) i. Define humus of the soil 1 mark  
ii. State three importance of humus 3marks  
(b) i. What is matter? 2marks  
ii. List the three-particulate nature of matter 3marks  
(c) i. Explain the meaning of pressure 2marks  
ii State three applications of pressure in our daily lives 1 ½ marks  
(d) i. Define a flower 1 mark  
ii. State three importance of a flower to a plant 1 ½ marks
4. (a) i. Differentiate between soil texture and soil structure 2marks  
ii Mention three importance of soil in crop production 3marks  
(b) Mention four elements of weather and the instrument used to measure each one of them 2marks
- (c) i. What is reactivity of metals 1 mark  
ii List four examples of reactive metals 2marks  
(d) i. What is a balanced diet? 2marks  
ii. List the six-food requirement in a balanced diet 3marks
5. (a) Define the following  
i. pollination  
ii. a fruit 2marks  
(b) State three (3) advantages of cross-pollination over self-pollination 3marks  
(c) i. Differentiate between rusting and corrosion 2marks  
ii Mention three(3) effects of corrosion of metals 3marks  
d) i. Distinguish between a pest and a parasite 2marks  
ii. State three reasons for applying insecticides to crops 3marks
- 6) (a) i. Explain the term circulatory system 2marks  
ii. State three(3) parts of the circulatory system 3marks  
(b) i. Define force of gravity 1 mark

- |                                                                      |        |
|----------------------------------------------------------------------|--------|
| ii. List three(3) ways of reducing friction                          | 3marks |
| (c) State four (4) importance of mixed farming                       | 2marks |
| (d) i. what is hazard?                                               | 1mark  |
| ii. State three accidents that might occur at the science laboratory | 3marks |

**PAPER 2 [40 MARKS] 45 MINUTES**

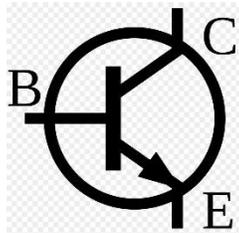
1. Cocoa drink is a mixture of cocoa powder and water. The cocoa powder is the
  - A. solute
  - B. liquid
  - C. solvent
  - D. solution
2. Which of the following is a change that occurs in girls during puberty?
  - A. Their voices deepen
  - B. Their hips grow wider
  - C. Their muscles grow stronger
  - D. They start producing sperms
3. Which one of the following gases do plants use to make their food?
  - A. Oxygen
  - B. Nitrogen
  - C. Hydrogen
  - D. Carbon dioxide
4. All objects on the earth are pulled to the earth by the force of
  - A. gravity
  - B. weight
  - C. height
  - D. mass
5. Fossil fuels are non-renewable sources of energy because they
  - A. are cheap
  - B. last forever
  - C. are irreplaceable
  - D. are readily available
6. Given below is a list of reactions involving some physical and chemical changes
  - I. Iron rusting
  - II. Wax melting
  - III. Paper burning
  - IV. Water freezing
  - V. Dissolving saltWhich of the above reactions involve chemical change?
  - A. I and II
  - B. I and III
  - C. I and IV
  - D. I and V
7. In a female, an unborn baby attaches itself to the
  - A. egg
  - B. ovum
  - C. ovaries
  - D. uterus
8. Which of the following is an example of a replaceable energy source?
  - A. coal
  - B. wind
  - C. candles

- D. kerosene
9. The metal that is liquid at room temperature is
- A. sodium
  - B. chlorine
  - C. mercury
  - D. hydrogen
10. The turning point of a lever is called the
- A. load
  - B. effort
  - C. fulcrum
  - D. Sprocket
11. How many modes of heat transfer exist?
- A. 2
  - B. 3
  - C. 4
  - D. 5
12. The natural way water circulates in nature is referred to as
- A. water conservation
  - B. water cycle
  - C. water circle
  - D. water recycle
13. A mixture can be solid-solid, an example is
- A. banku and soup
  - B. koko and sugar
  - C. iron-fillings and sand
  - D. water and salt
14. Anything that has weight, mass and occupies space is called
- A. energy
  - B. solid
  - C. liquid
  - D. matter
15. The bouncing back of light rays when it falls on smooth or shiny surfaces is referred to as
- A. refraction
  - B. bouncing
  - C. reflection
  - D. beam
16. A group of petals is called
- A. sepals
  - B. corolla
  - C. stigma
  - D. filament
17. Which of the following is formed when sunlight passes through many raindrops in the atmosphere?
- A. Echo
  - B. Rainbow
  - C. Thunder
  - D. Snow
18. Similar organs combined to perform one function is called
- A. cell

- B. organ
  - C. organ system
  - D. tissue
19. Which of the following activities uses distillation?
- A. Preparation of soup
  - B. Preparation of starch
  - C. Preparation of akpeteshie
  - D. Tapping of palmwine
20. Electricity is the flow of
- A. neutrons
  - B. electrons
  - C. protons
  - D. photons
21. The part of an electric circuit that completes the circuit and starts the flow of electricity when closed is called the
- A. power source
  - B. switch
  - C. load
  - D. conductor
22. Another name for the layers of a soil is
- A. levels
  - B. stories
  - C. horizons
  - D. blocks
23. The solid mass of rock below the soil is called
- A. organic
  - B. topsoil
  - C. subsoil
  - D. bedrock
24. Which of the following separation processes uses boiling to separate mixtures?
- A. Filtration
  - B. Sublimation
  - C. Crystallization
  - D. Distillation
25. Which of the following shows the three states of matter?
- A. Wood, charcoal and ash
  - B. Petrol, kerosene and diesel oil
  - C. Clay, humus and water
  - D. Steam, water and ice
26. Which of the following types of energy is stored energy?
- A. Kinetic energy
  - B. Heat energy
  - C. Electricity energy
  - D. Potential energy
27. A person must wear goggles in the laboratory when handling substances that
- A. are corrosive
  - B. are highly flammable
  - C. are poisonous
  - D. emit sparks

28. Which of the following is **not** a characteristic of every living thing?
- Photosynthesis
  - Reproduction
  - Growth
  - Feeding
29. Which of the following is **not** a characteristic of all cells?
- Cell membrane
  - Nucleus
  - Cytoplasm
  - Chloroplast
30. Which of the following is **not** matter?
- Ice block
  - Air
  - Light
  - Smoke
31. Which of the following activities is carried out in a crop production nursery?
- Mulching
  - Pruning
  - Prickling out
  - Transplanting
32. Which of the following is **not** a plant pest?
- Maize weevil
  - Louse
  - Weed
  - Rat
33. Which of the following organisms is an ectoparasite?
- Housefly
  - Liver fluke
  - Tapeworm
  - Tick

The diagram below is an illustration of a transistor. Study it carefully and use it to answer Questions 34 and 36.



34. The part labelled **B** is
- base
  - collector
  - emitter
  - resistor
35. The function of the part labelled **C** is to supply
- protons

- B. voltages
  - C. negative charges
  - D. positive charges
36. The part labelled **E** is
- A. capacitor
  - B. inductor
  - C. base
  - D. emitter
37. An example of small-scale industry in Ghana is the production of
- A. aluminium
  - B. computers
  - C. petrol
  - D. soap
38. Which of the following device is indigenous?
- A. Gear wheel
  - B. Loom
  - C. Pulley
  - D. Wheel barrow
39. A by-product obtained from the manufacture of soap is
- A. nylon
  - B. glycerol
  - C. polythene
  - D. vegetable oil
40. All the following are scientific principles involved in salt making **except**
- A. evaporation
  - B. polymerization
  - C. crystallization
  - D. recrystallization

**DAS BECE PERFORMANCE BOOSTER**  
**INTEGRATED SCIENCE MARKING SCHEME**

**Question 1**

(a)

- i. Because of presence of carbon dioxide in the expired air.....2mark
- ii. Calcium carbonate or  $CaCO_3$ .....2marks
- iii.  $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$ .....2marks
- iv. Nitrogen, water vapour or water, rare gases,..... 2marks
- v. To show that carbon dioxide is a by-product of respiration.....2marks

(b) (i) I. Pulley

II – Mass

III... Weight.....3marks

(ii) Frictional force

(iii)1. it causes wear and tear of machine parts

2. It reduces efficiency of a machine

3. It generate heat

4. It causes to wearing of the sole of our shoes

5. etc.....any 2points, 2marks, 1 mark each

(iv) weight is the product of mass and force of gravity .....2marks

(v) Pulley(simple machine).....2marks

(c) (i) I-----hydrogen gas

II-----retort stand

III-----delivery tube

IV-----Bunsen burner(source of heat) -----2marks, ½ mark each

ii) sodium, lithium, magnesium.....2marks

(iii) Hydrogen gas.....2marks

(iii) Potassium +water  $\rightarrow$  potassium oxide and hydrogen gas.....2marks

(v)  $2K + H_2O \rightarrow K_2O + H_2$ .....2marks

(d) (i) Rat or mouse-----2marks

(ii) I-----Fur,

II-----tail

III..... Vibrissa(sub-mental).....one mark each, 3marks

(ii) Yam, cassava,maize, rice, groundnut, etc.....any 3, 3mark

(iii) Trap, weeding, early harvest, rodenticides, etc.....any 2, 2marks

**NOTES: CORRECTS SPELLINGS TO MARK OTHERWISE AWARD ZERO MARK**

**THEORY 60 marks**

2(a) (i) Germination is the process whereby a viable seed starts to develop into a young plant or seedlings.....1mark, Correct definition and spellings to score

(ii) (1) Presence of water

(2) Suitable temperature

(3) The presence of oxygen

(4) Viability of seed.....3marks, any three points

(b) (i) Soil micro-organisms are organisms living in the soil for its proper functioning and productivity

[2marks]

(ii) i. they decompose organic matter in the soil thereby releasing plant nutrients

ii. They enhance the aggregation of soil particles thus improving soil structure

iii. They do borrow activities to aerate the soil

iv. Dead and decaying soil organisms help to make the soil fertile

v.etc. ....3marks, any 3 points, 1 mark each

(c)i. (α) Mass is the amount substances a matter contains.....1mark

(β) Volume is a space occupied by matter.....1mark

(ii) Apparatus: Measuring cylinder, string, stone

1. Half fill the measuring cylinder with water and take the volume as V1

2. Tie the stone with the string and carefully lower it into the water in the measuring cylinder

3. Read the volume as V2

4. Find the volume of the stone by subtracting V1 from V2(v2-v1).....2marks

(d) .....4marks

**Compound**

1. Chemical combination of two or more metals.
2. Cannot be separated by physical mean.
3. It is irreversible
4. It produces heat

**Mixture**

- Physical combination of two or more substances.
- Can be separated by Physical means
- It is reversible
- It does not produce heat

3(a) (i) Humus is the decayed remains of plants and animals in the soil----1 mark

(ii) 1. It lowers the stickiness of clay soil.

2. it helps in absorption of excess heat in the soil

3. it helps to bind the loose particles of the soil

4. it improves soil aeration

5. It improves of soil fertility-----3marks, 3points, 1 mark each

(b) Matter is anything that has weight and can occupy space. Eg. Stone .....1 mark

(iii) 1. Atom

2. Molecule

3. ion-----3marks

(c) (i) Pressure is defined as the force acting normally or perpendicularly per unit area of a surface--1 mark

(ii) (1) Pumping bicycle or a vehicle tyre

(2) The Brakes of a car use third pressure to cause the car to stop.

(3) Syringes for injections use atmospheric pressure etc.....3marks, 3points, 1 mark each

(d) (i) A flower is part of a shoot system of a plant which contains the male and the female sex organs for reproduction-----1 mark

(ii) (i) The flower helps the plant to produce fruits and seeds

(ii) The flower helps the plant during pollination

(iv) The flower helps plant to fertilized-----3marks, 3points, 1 mark each

4(a) (i) Soil texture refers to the relative proportions of sand, silt and clay in a given soil whiles soil structure refers to the way soil binds together. (It is the arrangement of soil into aggregates-----2marks

(ii) (1) Soil holds plants firmly into the ground

(2) Soil serves as habitat for organisms

(3) Soil helps in plant growth

(4)soil help plants to get water for photosynthesis, etc.....3marks, 1 mark each

(b) (4marks, 1mark each)

Elements of weather	Instruments
Rainfall	Rain gauge
Temperature	Thermometer
Atmospheric pressure	Barometer
Wind speed	anemometer
Wind direction	Wind vane

(c) (i) Reactivity of metals is the ability of metals to react with atmospheric oxygen, water and acids.....1mark

(ii) 1. Iron

2. Zinc

3. Magnesium

4. Potassium

5. Calcium etc.....2marks, any four, ½ mark each

d(i) A balanced diet is the type of diet which contain all the food nutrients in their correct proportions for growth.

2mark

(ii) 1. Carbohydrate

2. protein

3. Fats and Oil

4. Vitamins

5. Minerals

6. Water and Roughage.....3marks, ½ mark each

- 5(a) (i) pollination is the transfer of mature pollen grains from the anther to the stigma of a flower.....1mark  
(ii) A fruit is a fertilized ovule..... 1mark
- (b) 1. Seeds form may be varied  
2. Stamens and anthers ripe at different times but pollination is still possible  
3. it produces healthier plants,  
4. etc.....-3marks, 3points, 1 mark each
- (c) (i) Rusting is the reaction of iron or iron containing metals with water or moisture and oxygen to form an oxide of iron while corrosion is the gradual wearing away of the surface of the metal as a result of a chemical reaction between the surface of the metals and its environment.....2marks, without contrast award zero
- (ii) 1. Rusting causes accidents  
2. Rusting can cause injuries to people  
3. They reduce the value of the goods  
4. It increases the cost of maintenance.....3marks, 3points, 1 mark each
- d) (i) A pest is any organism which causes damage to crops or animals while a parasite is any organism which lives or depends on other organisms for survival or food.....2marks
- (ii)  
1. to increase crop yield  
2. to prevent and control pest  
3. to reduce the cost of production  
4. improve the growth of crops.....3marks, 3points, 1 mark each
- 6(a) (i) Circulatory system is a system of organs responsible for transporting materials (nutrients, water, oxygen) throughout the whole body..... 1mark
- (ii) 1. The Heart  
2. The blood vessel  
3. The blood.....3mark, 3 points, 1 mark each
- (b) (i) force of gravity is the type of force which pulls a falling object towards the center of the earth.....-1mark  
(ii) lubrication, the use of rollers, watering the surface, polishing, powdering, etc,.....any 3, 3marks
- (c) (1) Animals feed on by-products  
(2) There is improvement in soil fertility  
(3) There is regular supply of food for the farmer  
(4) The economic use of the land  
(5) etc.....4marks, 4points, 1 mark each
- (d)(1) Hazard is anything that can be dangerous to one's health or safety—1mark  
(ii) (1) Fire outbreak  
(2) Burns  
(3) Electric shock  
(4) Bruises  
(5) Fall  
(6) cut  
(7)etc.-----3marks, any 3, 1 mark each

PAPER 1

1. A
2. B
3. D
4. A
5. C
6. B
7. D
8. B
9. C
10. C
11. A
12. B
13. C
14. D
15. C
16. B
17. B
18. D
19. C
20. B

21. B
22. C
23. D
24. D
25. D
26. D
27. D
28. A
29. D
30. C
31. C
32. B
33. D
34. A
35. B
36. D
37. D
38. C
39. B
40. B

BECE BOOSTER  
INTEGRATED SCIENCE  
Essay and Objective  
2 hours

2&1

Name: .....

Index number: .....

## DAS B.E.C.E PERFORMANCE BOOSTER

### BASIC EDUCATION CERTIFICATE MOCK

INTEGRATED SCIENCE

2 hours

[100 marks]

Write your **name** and **index number** in **ink** in the spaces provided above

This booklet consists of two papers. Paper 2 is in two sections: **A** and **B**. Answer all questions section A and four questions in section B.

Answer paper 2 on the question paper.

Paper 2 will last 1 hr. 15 minutes after which the drawing sheets will be collected

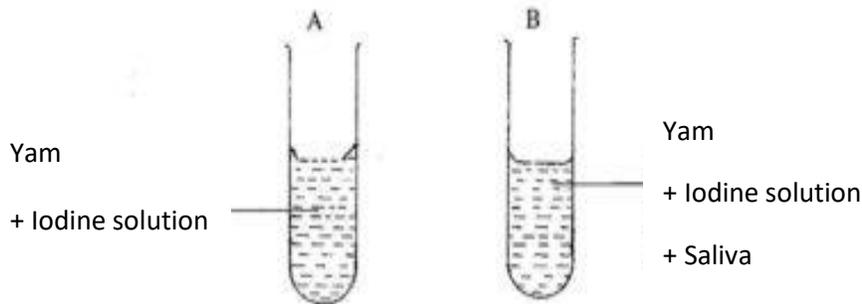
Answer paper 1 on your objective test answer sheet

Do not start paper 1 until you are told to do so. Paper 1 will last 45 minutes

**PAPER 2 ESSAY 100 MARKS (1HOUR 15 MINUTES)**

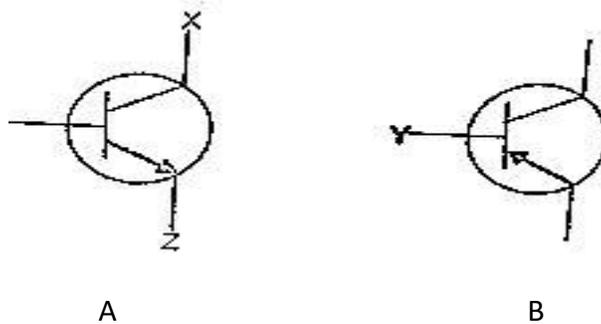
This paper is in two parts: I and II. Answer question 1 and any other 4 questions in part 2

1. (a) In an experiment, yam pap is put into two test tubes A and B containing iodine solution. The test tubes are warmed slightly to a temperature of 37°C and saliva is put into test tube B



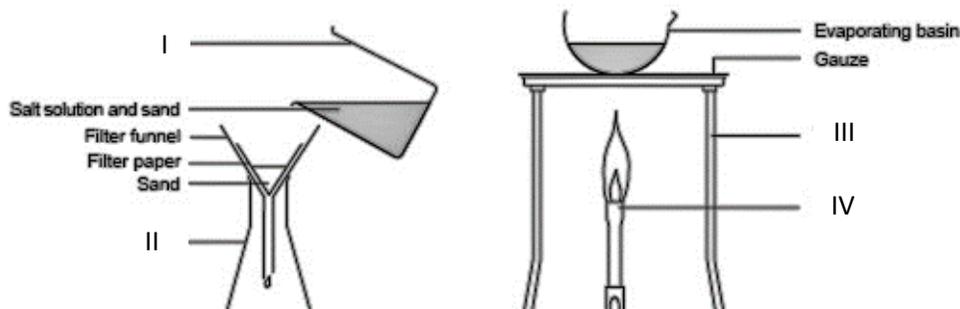
- State the colour of the content of test tube A 2 marks
- State the colour changes of the contents in test tube B after about 3 minutes 2 marks
- Fehling's solution is added to the contents of test tube B after the 3 minutes and it turns brick- red. What food substance is present? 2 marks
- Give two functions of saliva in eating 2 marks
- Why was it necessary to warm the contents of the test tubes to about 37°C? 2marks

- (b) The set-up below represents an electronic component. Study it carefully and answer the questions below



- What does A and B represent 2marks
- Name parts labelled X and Y 2marks
- What is the role of Y 4marks
- Mention the material that can be used to make A and B 2marks

- (c) The diagram below shows the set -up of how a mixture was separated in the laboratory. Use it to answer the questions that follow.





- 5a. (i) Describe the following
- α) Osmosis
  - β) Diffusion
- ii) State two applications of diffusion 4marks
- b. i. Define a compound
- ii. Write down the chemical formula for the following compounds
- α. carbohydrate 4 marks
  - β. chalk 5 marks
  - μ. table salt 2 marks
- c) Mention five importance of studying agriculture
- d) Mention four effects of illegal electrical connection on the country
- 6) a) State four functions of the blood 4 marks
- b) Mention four ways of conserving electricity in our homes 4 marks
- c) i. Differentiate between a pest and a parasite 2 marks
- ii. State three effects of pests on crops 3 mark
- d) Explain the reasons why gold does not rust but iron does 2 marks

**PAPER 2: OBJECTIVES 40 MARKS (45 MINUTES)**

1. The SI unit for measuring the work done by force is
  - A. J
  - B. K
  - C. N
  - D. w
2. The chemical formula of a compound describes the
  - A. Number of molecules in the compound.
  - B. Type of bonding in the compound.
  - C. Ratio in which the elements are combined.
  - D. State of the compound.
3. Which of the following life processes is presented by the equation  
Glucose + Oxygen + carbon dioxide+ water + energy?
  - A. Digestion
  - B. Excretion
  - C. Photosynthesis
  - D. Respiration
4. Each layer of the soil profile is known as
  - A. Horizon
  - B. B. litter
  - C. C. regolith
  - D. D. coarse
5. When the p-n junction of a transistor is reverse biased
  - A. Current flows from the p-type to the n-type
  - B. No current flows from the p-type to the n-type
  - C. Conduction of current occurs
  - D. Current flows from the n-type to the p-type
6. When a solid-liquid mixture is filtered, the liquid that separates out into the container is called
  - A. Filtrate
  - B. residue
  - C. sediment
  - D. solution
7. Which of the following processes involves the solid state of matter?
  - A. Boiling
  - B. condensation
  - C. Evaporation
  - D. melting

8. Which of the following system is **most** effective in maintaining soil fertility?
- A. Crop rotation
  - B. Land rotation
  - C. Mixed cropping
  - D. monoculture
9. The disease in humans which is associated with insufficient intake of calcium is
- A. Goiter
  - B. kwashiorkor
  - C. rickets
  - D. scurvy
10. The arrow in the circuit symbol of either N-P-N or P-N-P transistor is always on the
- A. Base lead
  - B. collector lead
  - C. emitter lead
  - D. receiver lead
11. Which of the following insect pests of crops has piercing and sucking mouthparts?
- A. Aphids
  - B. grasshoppers
  - C. Stem borers
  - D. Termites
12. The type of image formed in a plane mirror is always
- A. Diminished
  - B. enlarge
  - C. real
  - D. virtual
13. Which of the following statements about acids are **correct**?
- I. They turn red litmus paper blue
  - II. They can be classified as either organic or mineral acids
  - III. They can be neutralized by bases
- A. I and II
  - B. I and III only
  - C. II and III only
  - D. I, II and III
14. A transistor is said to operate in an active region when
- A. One P-N junction is forward biased and the other is reverse biased
  - B. Base- emitted junctions are reverse biased
  - C. Both P-N junctions are reverse biased
  - D. Base-collector junction is forward biased
15. Tuberculosis is spread
- A. Through eating of contaminated food
  - B. When an infected person coughs openly
  - C. Through shaking of hands of hands of infected persons
  - D. Through sharing of contaminated syringes
16. One function of engine oil in the engine of a tractor is to
- A. Warm the engine

- B. Enhance air intake
  - C. Ensure proper mixing of fuel
  - D. Lubricate the engine parts
17. The efficiency of a machine is always less than 100% because part of the energy input is used to
- A. Stop the machine after working
  - B. Perform useful work of the load
  - C. Overcome friction
  - D. Lift the machine up
18. Which of the following electronic components are used to produce oscillator circuits?
- I. Transistor
  - II. Inductor
  - III. Capacitor
- A. I and II
  - B. I and III only
  - C. II and III only
  - D. I, II and III
19. Which of the following crops is not correctly matched with its group?
- A. Cowpea – cereal crop
  - B. Cocoa-beverage crop
  - C. Coconut-oil crop
  - D. Cocoyam-tuber crop
20. Which of the following substances is a salt?
- A.  $H_2SO_4$
  - B. NaOH
  - C. HCL
  - D.  $CaCl_2$
21. Million's reagent is used to test for
- A. Carbohydrates
  - B. fats
  - C. protein
  - D. vitamin
22. Soil erosion on sloppy farmlands is **best** controlled by
- A. Cover cropping
  - B. mulching
  - C. strip cropping
  - D. terracing
23. A viable seed is one that
- A. germinates under suitable conditions
  - B. contains oil
  - C. develops from fertilize
  - D. has a pericarp
24. which of the following pairs of structures from part of the female reproductive system of humans?
- A. Urethra and uterus
  - B. Cervix and uterus
  - C. Ureter and uterus
  - D. Cervix and ureter

25. Which of the following chemical symbols is that of a metal?
- A. Ca
  - B. Ne
  - C. P
  - D. S
26. All the living and non-living things that surround an organism constitute its
- A. Community
  - B. ecosystem
  - C. environment
  - D. habitat
27. Which of the following crops should be planted after cassava in crop rotation?
- A. Cocoyam
  - B. cowpea
  - C. Onion
  - D. Yam
28. Endo- parasites in farm animals can be controlled by
- A. Drenching
  - B. dipping
  - C. dusting
  - D. spraying
29. Which of following devices requires the use of transistors in its operation?
- A. Computer
  - B. Electric heater
  - C. microphone
  - D. wall clock
30. Feel method is to determine soil
- A. Air
  - B. colour
  - C. Structure
  - D. texture
31. 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
32. An anemometer is an instrument used in determine
- A. Amount of rainfall
  - B. Speed of wind
  - C. Relative humidity
  - D. Intensity of light
33. 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
34. Which of the following characters is not acquired through heredity?  
A. Language spoken B. Shape of nose C. Colour of eyes D. Temperament
35. Which of the following statements is true at the boiling point of water? The  
A. Mass of the water remains the same.  
B. Temperature increases  
C. Temperature remains constant.  
D. Volume of the water increases
36. When matter changes state from gas to liquid there is  
A. a decrease in mass  
B. a decrease in volume  
C. a decrease in pressure  
D. an increase in temperature
37. the basic unit of matter is the  
A. Atom B. Compound C. Element D. Mixture
38. The process by which steam is changed into water is called  
A. Evaporation B. condensation C. melting D. sublimation
39. Which of the following metals exists as a liquid at room temperature?  
A. Iron A. Brass C. Gold D. Mercury
40. The chloroplasts in the plants cells contain  
A. Dissolved food substances  
B. Waste materials  
C. Chlorophyll  
D. Oxygen

# DAS BECE PERFORMANCE BOOSTER

## INTEGRATED SCIENCE

### MARKING SCHEME

- (a) (i) Blue black [ 2 marks, correct to score, correct spellings]  
(ii) pale blue black [2 marks, correct and correct spellings to score]  
(iii) maltose or reducing sugar [ 2 marks, correct and correct spellings]

**(Correct spellings to score otherwise award zero)**

- (iv) a. Functions of saliva  
b. makes the food softer for easier chewing and swallowing  
c. Contains the enzyme ptyalin, which breaks down carbohydrates to reducing sugar

**[Any 2 points, 2marks, 1 mark each, correct to score]**

- (v) To attain the normal body temperature, at which the enzyme in saliva can work efficiently

**[Any point, 2 marks, correct to score]**

- b) (i) A-----NPN Transistor  
B-----PNP Transistor -----correct to score 2marks  
(ii) x-----collector  
Y-----base  
Z-----Emitter-----3marks, correct to score  
(iii) the base pulls holes/positive charges from the emitter-----1marks  
(iv) silicon-----correct to score,.....-2marks  
(v) a. as a switch  
b. As an amplifier  
c. As a voltage regulator  
d. As a rectification -----correct to score, 2marks

- (c) (i) I .....Beaker

II .....conical flask

III.....Tripod Stand

III.....Bunsen Burner

[4marks]

- (ii) A.....filtration  
B.....Evaporation/boiling [2marks, 1mark each]  
(iii) Provide a source of heat [ 1 mark]  
(iv) A.....Mixture of water and sand/purification of water  
B.....mixture of salt and water, mixture of sugar and water [1mark, ½ mark each]  
(v) B.....sea salt is obtained through evaporation [1 mark]  
(vi) Water [1mark]

(correct spellings to score, otherwise award zero)

(d) i.

- A. Digging fork/garden fork
  - B. Spade
  - C. Hand fork
  - D. Garden trowel/hand trowel
  - E. Watering can
- 5marks, 1mark each
- correct spellings to score, otherwise award zero)**

ii.

Tool	uses
A. Garden fork	Turning compost heap/digging soil during bed preparation
B. Spade	Digging/lifting and turning soil
C. Hand fork	Stirring soil/vegetable bed
D. Garden trowel	Transplanting seedlings
E. Watering can	Watering/irrigating crops

5marks, 1mark each

**(note correct spelling to score, otherwise award zero mark)**

### PART 2(60 marks)

**(a) (i)** Respiration is the process by which the body obtain energy(glucose) from food with or without oxygen----  
----**1mark, correct to score**

**(ii) 2marks, correct to score**

Aerobic respiration	Anaerobic respiration
Oxygen is required	No oxygen is required
A lot of energy is produced	Less energy is produced

**(b) (i)** Crop rotation is a system of farming where different types of crops are grown on the same piece of land in a definite order or cycle whiles land rotation is the system of farming whereby a farmer cultivate a piece of land for some time and leaves it to cultivate a new land and the fertility of the land is lost-----  
**2marks, correct to score**

**(ii)**

1. It retains nutrients in the soil
2. It controls weeds
3. Pest are controlled
4. Soil erosion is controlled
5. Etc. -----**any 3 points, 1 mark each ,3marks, correct to score**

**(c) (i)** A transistor is a three-terminal semi-conductor device commonly use as an amplifier or an electrical control switch-----**1marks, correct to score**

**(ii)**

1. It used as a switch
2. It is used as amplifier
3. It is used for rectification
4. It is used to regulate current -----**any 3 points, 1 marks-3marks, correct to score**

(d) Differences between acids and bases---**any 3 points,3marks, correct to score**

Acids	bases
1. They taste sour	They taste bitter
2. They turn wet blue litmus paper red	They turn red litmus paper blue
3. They have Ph less than 7	They have Ph greater than 7
4. etc	

### Question 3

(a) (i) pruning is the removal unwanted part of a plant/crop-----**1mark, correct to score**

(ii)

1. It makes harvesting easy
2. It reduces pests and diseases
3. It makes fruits bigger
4. It improves penetration of light-----**any 3 points, 1 mark each 3marks, correct to score**

(b) (i) Mass number is the number of protons and neutrons in the nucleus of an atom while atomic number is the number of protons in the nucleus of an atom -----**2marks, correct to score**

(ii)

Mass number = 35

Atomic number =17

The electron number = 17

The electron number is the same as the number of proton which also the atomic number-----

**3marks, correct to score**

(c) (1) it cause the speed of object to change

(2) it cause a moving object to stop

(3) it can change the direction of a body

(4) it changes the shape of a body ----- **any 4 points, 1 mark each 4marks, correct to score**

(d) (i) Indigestion refers to the condition in which food is not properly digested or broken down into simpler unit in the digestive system-----1mark.

(ii) (1) nausea

(2) stomach ache

(3) severe abdominal pain

(4) burning sensation in the stomach-----**2marks, half each**

### Question 4

(a)

1. It helps farmers to know the type of farming method to be used
2. It affects water and air relationship in the soil
3. It influences the water holding capacity of the soil
4. It helps the farmers to know the type of crops to cultivate
5. Etc.

**any 4 points, 1 mark each 4marks, correct to score**

(b) (i) reflection of light is the bouncing back of light into the same medium when it strikes on a surface -----  
-----**1marks, correct to score**

(ii)

- a. submarines use it to search for incoming warship
- b. drivers of double decker buses use it to view upper deck
- c. it is used to look for objects behind obstacles
- d. it is used to observe from armoured tanks the objects above them
- e. short spectators use it to watch match

**any 3 points, 1 mark each 3marks, correct to score**

(c) Differences between physical and chemical change----**4marks**

Physical change	Chemical change
No new substances are formed	New substances are formed
Not accompanied by heat	Accompanied by heat
Reversible	Not reversible
No change in mass	Change in mass

**any 3 points, 1 mark each 3marks, correct to score**

(d) (i) fertilization in human is fusion of male and female sex cell to form embryo zygote----**2marks**

**Correct to score**

(ii)

- a. it prevents diseases and infections
- b. it helps in intercourse -----**2marks, any 2 points, 1 mark each 2marks, correct to score**

**Any other relevant answers**

### Question 5

(a) (i) osmosis is the movement of solvent molecules from a weaker solution to a stronger solution through a semi-permeable membrane---**1mark**

(ii) diffusion is the process whereby molecules or particles move from a region of higher concentration to a region of lower concentration—**1mark**

(b) (i) compound is the chemical combination of two or more elements

(ii)

α) carbohydrate-  $C_6H_{12}O_6$

β) chalk -  $CaCO_3$

μ) Table salt- $NaCl$ -----**3marks, 1 mark each, correct to score**

(c)

1. income for farmers
2. food for people
3. employment
4. foreign exchange
5. raw materials for industries
6. medicine-----**5marks**

(d)

1. it cause low current
2. It causes fire out-break
3. It causes damage to appliance
4. High cost electricity
5. Loss of government revenue-----**4marks**

### QUESTION 6

- (a) (i) it helps to transport oxygen to the parts of the body  
(ii) It transport food nutrients to other parts of the body  
(iii) it helps the body to fight against infections  
(iv) it helps in reproduction  
V. it helps in blood clothing -----**4marks**

**any 4 points, 1 mark each 4marks, correct to score**

- (b) (1) ironing in bulk  
(2) switching all appliance if not in use  
(3) avoid illegal connection  
(4) do not leave frequently open doors of fridges  
(5) etc. -----**4marks**

**any 4 points, 1 mark each 4marks, correct to score**

(c) (i) A pest is an organism that cause damage to crops or other organisms while a parasite is an organism that live on another organism for food and survival-----**2marks**

(ii) (1) they cause diseases

(2) they cause stunted growth

(3) they reduce crop yield

(4) they increases the cost of production-----**3marks**

**Any 3 points, 1 mark each 3marks, correct to score**

(d) Gold is non-reactive metal but iron is a reactive metal-----**2marks**

OBJECTIVES

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

BECE BOOSTER  
INTEGRATED SCIENCE  
Essay and Objective  
2 hours

2&1

Name: .....

Index number: .....

# DAS B.E.C.E PERFORMANCE BOOSTER

**BASIC EDUCATION CERTIFICATE MOCK**

## INTEGRATED SCIENCE

2 hours

[100 marks]

Write your **name** and **index number** in **ink** in the spaces provided above

This booklet consists of two papers. Paper 2 is in two sections: **A** and **B**. Answer all questions section A and four questions in section B.

Answer paper 2 on the question paper.

Paper 2 will last 1 hr. 15 minutes after which the drawing sheets will be collected

Answer paper 1 on your objective test answer sheet

Do not start paper 1 until you are told to do so. Paper 1 will last 45 minutes

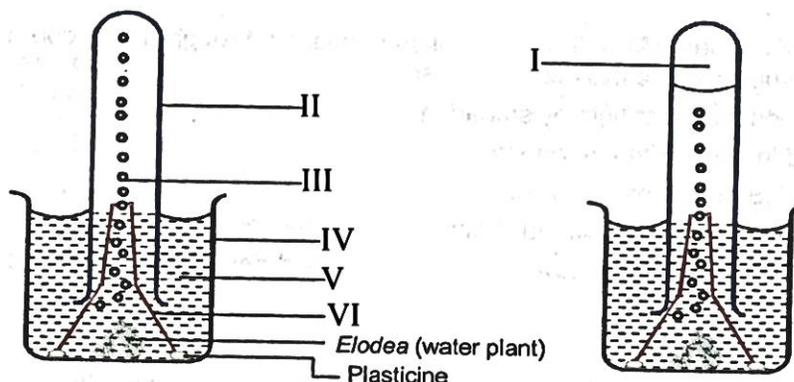
This paper is in **two** sections: **A** and **B**. Answer Question **1** in section **A** and any offer **four** questions in section **B**. Answer **all** the questions in your answer booklet.

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

SECTION A  
 [40 marks]

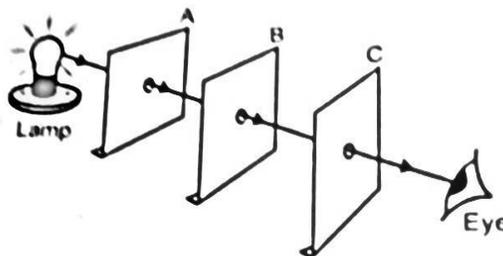
Answer **all** of Question 1

1(a) The experiment below represents a test for a phenomenon in a laboratory. Study it carefully and answer the questions below.



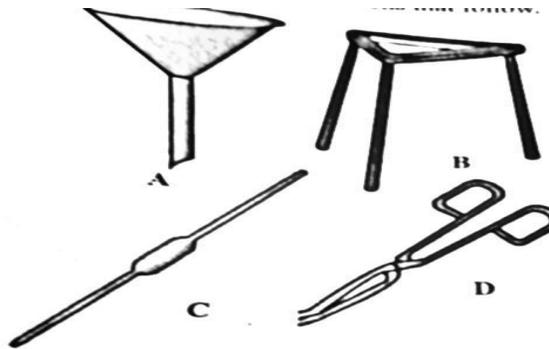
- i. State the aim of the experiment [1mark]
- ii. Name I to VI in the set-up [6marks]
- iii. Why was II in the experiment inverted [1marks]
- iv. How will you test for the gas produced [1mark]
- v. Why is the set-up placed in sunlight but not a dark room? [1mark]

(b) Use the diagram below to answer the questions that follow



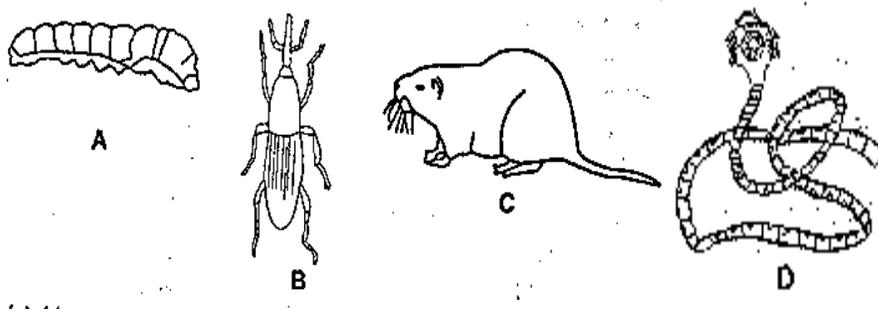
- i. What would the observer see from the position shown? [2mark]
- ii. What happens when cardboard B is shifted? [1mark]
- iii. Explain the observation made (b) above [2marks]
- iv. What does the experiment demonstrate? [1mark]
- v. Mention two devices that works on property of light demonstrated [2marks]
- vi. Mention two natural occurrences that could be explained by the property of light demonstrated [2marks]

- c) Study carefully the laboratory devices illustrated in the diagrams and use them to answer the questions that follow.



- i. Identify each of the devices A, B, C and D [4marks]
- ii. State one use of each of the devices A,C and D [4marks]
- iii. Describe how each of the devices C and D is use [2marks]

- d) Study the organisms below and answer the questions



- i) Identify the organisms A, B, C,D [4marks]
- ii) List one crop each destroyed by organisms A, B,C [3marks]
- iii) State one way of controlling D [1mark]
- iv) List the group by which organisms B and D belongs [ 2marks]

SECTION B [60 marks]

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

2. (a)(i) Differentiate between ecosystem and community [3 marks]
- (ii) State two adaptations of fish [3 marks]
- (b) (i) Differentiate between corrosion and rusting [4 marks]
- (ii) Explain how moisture causes rusting [4 marks]
- (c) State four applications of pressure [4 marks]
- (d) (i) What is soil structure [4marks]
- (ii) Mention two ways of improving the structure of the soil [4marks]

- 3 (a) Explain the meaning of the following in science:
  - (i) integrated science;
  - (ii) biology;

- (iii) technology [3marks]
- (b) State **three** functions of the human blood [3marks]
- (c) (i) Explain the meaning of agriculture  
(ii) State three reasons for studying agriculture [5marks]
- (d)(i) Explain the terms kinetic energy  
(ii) An Object of mass 50kg with a velocity of  $2010\text{ms}^{-1}$  calculate the kinetic energy [4 marks]
4. (a) Mention three reasons for mixed farming [3 marks]  
(b) (i) List three sources of electricity  
(ii) Define electric current [4 marks]  
(c) State four applications of anaerobic respiration [4 marks]  
(d) (i) Define atom  
(ii) State the three charges of atom [4marks]
5. (a) (i) What is lever of a machine?  
(ii) List the types of lever [5marks]  
(b) (i) Differentiate between pest and parasite  
(ii) State **two** effects of pest on crops [4 marks]  
(c) (i) What is female reproductive system in humans?  
(ii) List two parts of the female reproductive system [3marks]  
(d) Write the systematic names of the following compounds  
i.  $\text{CaCO}_3$   
ii.  $\text{CuSO}_4$   
iii.  $\text{NaCl}_2$  [3marks]
6. (a) (i) Define basic quantity  
(ii) State three reasons for taking measurement [4 marks]  
(b) (i) what is respiration?  
(ii) Explain the role of oxygen in respiration [4 marks]  
(c) (i) Define stirring in crop production  
(ii) State two reasons for stirring crops [3 marks]  
(d) State four differences between physical and chemical change [4 marks]

1. Which of the following is similar to a bulb in electronics?
  - A. Transistor
  - B. Light Emitting Diode (LED)
  - C. P-N junction diode
  - D. Capacitor
2. The two main processes for rain formation are
  - A. Solidification and freezing
  - B. Freezing and evaporation
  - C. Sublimation and condensation
  - D. Evaporation and condensation
3. The scientific errors occur due to
  - A. Lack of science textbooks
  - B. Inadequate staff
  - C. Wrong measurement
  - D. Wrong hypothesis
4. A higher mass with a decrease length, width and height of a block will result in
  - A. Lower density
  - B. Equal density
  - C. Higher density
  - D. No change in density
5. The application of natural science in specific field of study is referred to
  - A. Biology
  - B. Technology
  - C. Applied science
  - D. Integrated science
6. One unique characteristics of compound is that it is
  - A. Made up of molecules
  - B. Chemically bond
  - C. Mixture of elements
  - D. Separable with physical means
7. Mulching of the soil helps the soil to
  - A. Retain more courses
  - B. Crops
  - C. Regulate temperature
  - D. Brings more water to crops
8. The section of the soil profile where nutrients of the soil are found is
  - A. B-horizon
  - B. A-horizon
  - C. C-horizon
  - D. D-horizon
9. The part of a cell which contains all living materials in the cell is
  - A. Nucleus
  - B. Cell wall
  - C. Cytoplasm
  - D. Vacuole
10. A multi-cellular organism
  - A. Consists of only one cell
  - B. Does not reproduce
  - C. Consist of many different cells
  - D. Does not respire
11. In simple term cotyledon is
  - A. Seed coat
  - B. Seed leaf
  - C. Seed radicle
  - D. Seed plumule
12. The embryo of a seed consists of
  - A. The plumule and cotyledons
  - B. The plumule and radicle
  - C. The radicle and the cotyledons
  - D. The plumule, radicle and cotyledons
13. Which of these crops can grow well in clayey soil?
  - A. Sugar cane
  - B. Cocoa
  - C. Plantain
  - D. Yam
14. One advantage of mixed farming is that
  - A. Farmer gets more yield
  - B. Animals ration are obtained
  - C. Farmer gets engage
  - D. More income is assured
15. The rotational point of a lever is the
  - A. Load
  - B. Effort
  - C. Pivot
  - D. normal
16. Which of these are true about real image?
  - I. It can be formed on a screen
  - II. It can be represented by a dotted line
  - III. It is formed by the actual intersection of two or more rays from an object
  - IV. An example is image formed in a camera
  - A. I and II only
  - B. I, III and IV
  - C. I, II, III, and IV
  - D. III and IV only

17. One advantage of hard water is that, hard water
- Is good for strong bones and teeth
  - Dissolves lead
  - Saves a lot of soaps
  - Is for dyeing and tanning
18. One of the effects of science and technology on humanity is
- Destruction of water bodies
  - The use of weapons and bombs
  - Negation of traditional medicine
  - The use of internet
19. The tapeworm mostly infests
- Human beings
  - Farm animals
  - Crops
  - plants
20. The first principle in crop production is
- Climatic condition
  - Site selection
  - Marketing
  - Land preparation
21. Total darkness in the formation of eclipse is
- Shadow
  - Opaque
  - Umbra
  - Penumbra
22. ....is the bouncing back off light into the same medium, when it strikes a surface
- Refraction
  - Shadow
  - Incident ray
  - Reflection
23. Which of the following is used to look for objects behind obstacles?
- Microscope
  - Camera
  - Pinhole camera
  - Periscope
24. The colour code of carbon resistors for black is
- 1
  - 2
  - 5
  - 0
25. Oxygen dissolves in water for aquatic organism to
- Respire
  - Excrete
  - Reproduce
  - Grow
26. The blood vessel which carries blood away from the heart is called
- Heart
  - Capillary
  - Artery
  - Vein
27. Chicken pox is caused by.....
- Fungi
  - Bacteria
  - Virus
  - nematodes
28. The pressure of an objects is 5Pa. If the force acting on the objects is 50N. Find the area
- $5m^2$
  - $10m^2$
  - $9m^2$
  - $20m^2$
29. The farming system whereby a farmer cultivates a piece of land for sometime and then leave it to cultivate a new land without moving his family is
- Shifting cultivation
  - Crop rotation
  - Land rotation
  - Mixed farming
30. In respiration, gaseous exchange takes place in the
- lungs
  - nasal cavity
  - trachea
  - aveoli
31. The main function of hair in nostril is to..
- Trap air
  - Filter inhaled air
  - Filter exhaled air
  - Dissolve air
32. Which gas turns lime water milky
- Oxygen
  - Carbon dioxide
  - Hydrogen
  - Helium
33. Which of the following is a renewable source of energy?
- The sun
  - Fire wood
  - Nuclear
  - Fossil fuel

34. The two compounds which make biogas are
- Methane and water
  - Methane and carbon dioxide
  - Carbon dioxide and water
  - Water and calcium carbonate
35. The type of energy produced by splitting up of the nucleus of an atom is
- Chemical energy
  - Kinetic energy
  - Heat energy
  - Nuclear energy
36. The main condition between the sun, the earth and the moon for the formation of eclipse is
- The sun should be vertical to the earth
  - The three heavenly bodies must be on straight line
  - They must be opposite each other
  - The sun must be on always
37. A torchlight derives its energy from
- Petrol
  - A dry cell
  - Gas oil
  - Kerosene
38. A 1000 ohm resistor has the colour code
- Brown, black, red, gold
  - Red, yellow, blue, black
  - Red, black, green, gold
  - Yellow, green, brown, red
39. The basic unit of matter which can take part in chemical reaction is
- Element
  - Molecule
  - Atom
  - Anion
40. The process of combining several pest control methods to control pests is called
- Mechanical Pests control
  - Chemical Pests control
  - Biological pest control
  - Integrated pest management

**INTEGRATED SCIENCE**

**MARKING SCHEME**

**TEST OF PRACTICAL**

**QUESTION 1a.**

- i. Experiment to demonstrate that oxygen is released as a by-product of photosynthesis.....1mark
- ii. I..... oxygen (air)  
II.....Test Tube  
III .....Bubble of gas  
IV.....Beaker  
V.....Water  
VI.....Inverted Funnel  

**[6marks, ½ mark for each, correct spellings to score]**
- iii. To enclose the water plant.....**1mark**
- iv. A glowing splint is introduced to the gas suspected to be oxygen, a pop sound will be produced or rekindles.....**1mark**
- v. Sunlight produces energy to help water and carbon dioxide to release oxygen as by-products of photosynthesis.....**1mark**

**Note: correct to score, 10 marks**

**QUESTION 1b.**

- i. The observer will see the source of light through the holes.....2marks
- ii. The source of light cannot be seen by the observer.....**[1mark, correct to score]**
- iii. The observation is that light travels in a straight line.....[2 marks]
- iv. The experiment demonstrates rectilinear propagation of light ..... 1mark
- v. Projector, camera, touch light, lamp.....**any two points, 1 mark each, 2marks**
- vi. Eclipse of the sun, eclipse of the moon.....**any two marks, 1 mark each, 2 marks**

**QUESTION 1c.**

- i. A .....Funnel  
B.....Tripod stand  
C.....Pipette  
D.....A pair of tongs.....4marks, 1 mark each
- ii. A(Funnel) .....transferring liquid from one container into another container---2marks  
C(Pipette).....for drawing solutions of specific volume of liquids-----1mark  
D(A pair of tongs).....to hold hot objects.....1mark
- iii. (C) Pipette
  - a. The pointed part of C is immersed in the solution
  - b. The mouth is put at the blunt end and air sucked from it.....1mark

(D) a pair of tongs

a. the thumb is place in the cavities of the device D

b. open the end of the device to hold the object.....1 mark

**QUESTION 1d.**

i.

F. Caterpillar

G. Weevil

H. Rat/mouse/grasscutter

I. Tape worm.....[5marks, 1mark each]

**(correct spellings to score, otherwise award zero)**

ii.

Tool	uses
F. Caterpillar	All green leafy vegetables
G. weevil	All grains or cereals and legumes like beans
H. rat/mice	Maize, cassava, tubers, grains or cereals etc

**[3 marks, 1 mark each, correct to score]**

iii. deworming, vaccination [[1 mark any one point, correct to score]

iv. B(rat, mouse).....rodent pest/pest

D (tape worm).....endo parasite/parasite.....2marks, one mark each

**SECTION B [60 marks]**

**Answer four questions**

**QUESTION 2a.**

i. Ecosystem refers to living things and their natural environment **while** community refers to all the population of different species living in a habitat [ **1mark, correct to score**]

- ii. (1) It has gills for breathing  
(2) It has fins for sifting through the water bodies  
(3) It has eyes for viewing objects  
(4) It has scales for easy movements  
(5) It is streamlined for easy movement ..... [two points, 2 marks, 1 mark each]

**QUESTION 2b.**

(i) Corrosion is the wearing away of the metal by the action of chemical reactions such as acids, water, etc where as rusting is the reaction of iron or iron containing substances with moisture and oxygen to form an oxide iron.....[ **2marks, correct to score**]

(ii) Moisture enables oxygen to be reacted to be able to form iron oxide for rusting to occur [2marks}

**QUESTION 2c.**

1. Syringes for injections use atmospheric pressure
2. Pumping bicycle and lorry tyres
3. Pipette uses pressure
4. Brakes of a car uses pressure
5. Drinking straw uses pressure

**[ any 4 points, 4marks, 1mark each]**

**QUESTION 2d(i)**

Soil structure describes how the soil particles are arranged or packed into aggregates

**[ correct definition to score, 2marks]**

**QUESTION 2d(ii).**

1. Mulching
2. Crop rotation
3. Proper farming methods
4. Application of fertilizers
5. Adding organic manure to the soil

**6. Etc. [ any two points, 2marks, 1 mark each, correct to score]**

**QUESTION 3a.**

- i. Integrated Science is the study of science in holistic manner in such a way that no aspect of science are left out.
- ii. Biology is the study of living organisms
- iii. Technology is the study of scientific knowledge to create things to benefit mankind

**[ 3 marks,1mark each, correct definition to score]**

**QUESTION 3b.**

- i. Blood carries oxygen from the lungs to the body tissue
- ii. It carries digested food from the small intestine to the body tissue
- iii. It carries carbon dioxide from the body to the lungs
- iv. It distributes heat in the body to regulate body temperature
- v. It forms defensive system of the body to fight infections
- vi. It carries hormones from the glands to target organs or tissues
- vii. It helps in excreting waste product from the body

**viii. Etc.....[ 3marks, 3points, 1mark each, correct to score]**

**QUESTION 3c(i).**

- i. Agriculture is the growing of crops and rearing of farm animals

**QUESTION 3c(ii) .**

- i. Provision of food
- ii. Income generation
- iii. Raw materials to industries
- iv. Employment creation
- v. Revenue to government
- vi. Foreign exchange
- vii. Medicinal purpose
- viii. Game and sports [any 3 points, 1 mark each, 3marks, correct spellings to score]

**QUESTION 3d(i).**

Kinetic energy is the energy possessed by a body by virtue of its motion

[2 marks, correct definition to score]

**QUESTION 4d(ii).**

$mass = 50kg$ ,  $velocity = 2010ms^{-1}$

$$kinetic = \frac{1}{2}mv^2.$$

$$kinetic = \frac{1}{2} \times 50 \times 2010^2.$$

$$kinetic = \frac{1}{2} \times 50 \times 2010 \times 2010.$$

$$kinetic = 25 \times 2010 \times 2010.$$

$$kinetic\ energy = 101,002,500J.$$

[ 2marks, show working to score]

**QUESTION 4a.**

1. To get animals to feed on the crop residue on the farm
2. To improve soil fertility as animal manure will be used
3. To get regular supply of food and animal product
4. To reduce risk against bad weather or any outbreak of epidemics
5. To get efficient use of labour
6. To use the land economically
7. Etc.

[ 3 points, correct to score, 1 mark each, 3marks]

**QUESTION 4b(i).**

- i. Hydroelectric power

- ii. Generators
- iii. Dynamos
- iv. Solar panels
- v. Windmills
- vi. Thermal power
- vii. Voltaic cells
- viii. Etc.

[ any 3 points, correct to score, 1 mark each, 3marks]

**QUESTION 4c.**

- i. Bakery industry uses anaerobic respiration for preparation of bread
- ii. Anaerobic respiration is used in kenkey preparation
- iii. Brewery respiration in preparation of soft drink
- iv. Distilleries used respiration for preparation of gin
- v. It is applied in production of yoghurt
- vi. Etc. ....[ any 4points, 1 marks each, 4marks]

**QUESTION 4d(i)**

Atom is the smallest indivisible particle of element which can take part in chemical reaction

[1mark, correct definition to score]

**QUESTION 4d(ii)**

- 1. Protons (positive charge)
- 2. Electrons (negative charge)
- 3. Neutron (neutral charge or zero charge) [ 3mark, 1 mark each, correct spellings to score]

**QUESTION 5a(i).**

A lever is a simple machine that consists of a rigid bar, which turns freely at a fixed point called pivot

[ correct definition to score, 1mark]

**QUESTION 5a(ii).**

- i. First class lever
- ii. Second class lever
- iii. Third class lever [3 marks, 1 mark each, correct to score]

**QUESTION 5b(i).**

A pest is living organism which cause physical damage to crops and animals whiles a parasite is an organism which depends on other organisms for food and shelter

[ correct definition to score, 2marks, it should have contrast to score]

**QUESTION 5b(ii).**

- i. Pest causes physical damage to crops
- ii. Pest causes diseases in crops and animals
- iii. Pest reduces yield of crops and animals
- iv. It leads to stunted growth in animals
- v. Etc.

[ any 2points, 1 mark each, 2marks]

**QUESTION 5c(i)**

The female reproductive system consists of organs producing the female sex responsible mating with male sex cell to produce a fetus .....[1 mark, correct definition to score]

**QUESTION 5c(ii).**

Ovary, uterus, cervix, vagina, vulva, clitoris

[Any two, 1 mark each, 2marks]

**QUESTION 5d.**

- iv.  $CaCO_3$  =calcium carbonate
- v.  $CuSO_4$  =copper sulphate (copper (II) sulphate
- vi.  $NaCl_2$  =sodium chloride

[ 1mark each, correct spellings to score, otherwise award zero]

**QUESTION 6a(i).**

Basic quantity is a quantity whose units cannot be derived from other quantities or units.

[correct definition to score, 1 mark]

**QUESTION 6a(ii)**

- i. To avoid cheating
- ii. To prevent wastage
- iii. To show truthfulness
- iv. To ensure consistency and reliability
- v. Etc. ....[any 3 points, 3marks, 1mark each, correct to score]

**QUESTION 6b(i).**

Respiration is the breaking down of glucose in the cell with or without oxygen to release energy by bringing out carbon dioxide and water vapour.

[2 marks, correct definition to score]

**QUESTION 6b(ii)**

Oxygen aid the process of breathing(inhalation) to able to help complex food substance to break down into simple form to release energy.....[2 marks, correct to score]

**QUESTION 6c(i)**

Stirring is the practice of digging up the soil to allow fresh air and water penetrate into the soil.

[1 mark, correct definition to score]

**QUESTION 6c(ii)**

- i. Free movement of air into the soil
- ii. It improves drainage
- iii. It controls weed growth
- iv. It improves soil structure
- v. Etc.....[any 2 points, 1mark each, 2marks]

**QUESTION 6d.**

Physical change	Chemical change
No new substances are formed	New substances are formed
It is reversible	It is not reversible
No change in mass	Change in mass
Individual components retain their properties	Individual components lose their property
Not accompanied by heat change	Accompanied by heat change

[any four points, 1 mark each 4marks]

**PAPER 1 [40 MARKS]**

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



