

BECE/0021

INTEGRATED SCIENCE  
ESSAY and OBJECTIVE  
2 HOURS

**2&1**

Name: .....

Index Number.....

## MR GABRIEL EXAMINATION CONSULT

**BECE 2022**

**INTEGRATED SCIENCE 2 &1**

**2 hours**

*All answers must be provided on clean sheet of papers (Answer booklet).*

Write your name and index number on the sheets.

This examination consists of two papers. Answer Paper 2 which comes first, in your answer booklet and Paper 1 on your Objective Test answer sheet. Paper 2 will last for 1 hour 15 minutes and is in two parts; **I & II**. Answer all questions in part I and any other **four** questions in part II.

Answer all questions in your answer booklet.

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

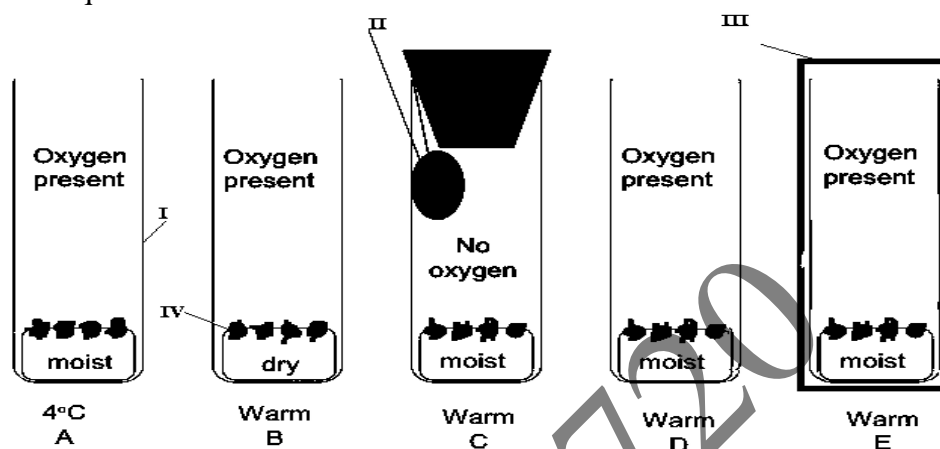
DESIST FROM REFERING TO BOOKS BEFORE PROVIDING ANSWERS

## INTEGRATED SCIENCE 2

This paper is in two parts; **I & II**. Answer all questions in part I and any other **four** questions in part II.

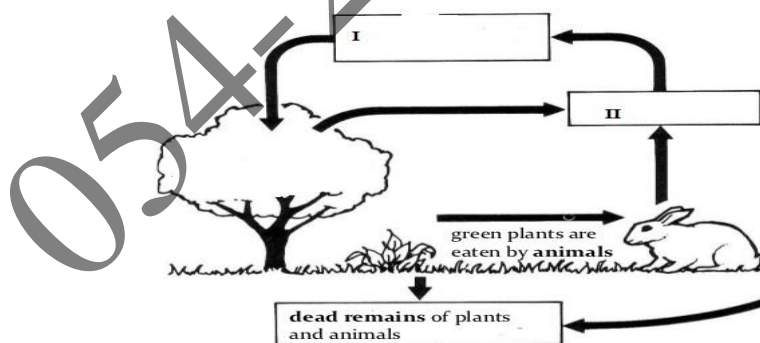
### PART I

Q1. (a) The set up below is an experiment to demonstrate the conditions necessary for germination to occur. Use it to answer the questions that follow



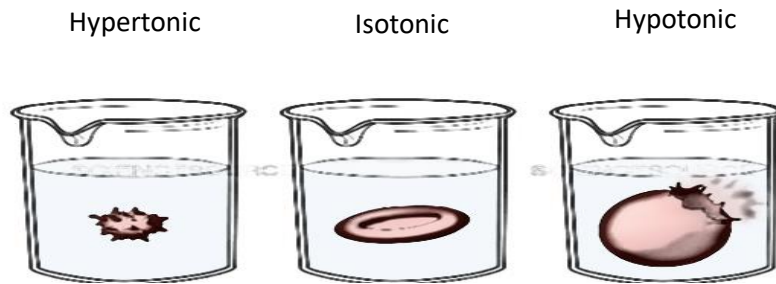
- i. Identify the parts labeled I, II, III and IV [2 marks]
- ii. What is the purpose of II in the experiment [2 marks]
- iii. In which test tubes are germination likely to occur [4 mark]
- iv. Explain your answer in question (iii). [2 marks]

(b) Study the diagram below and answer the questions that follow

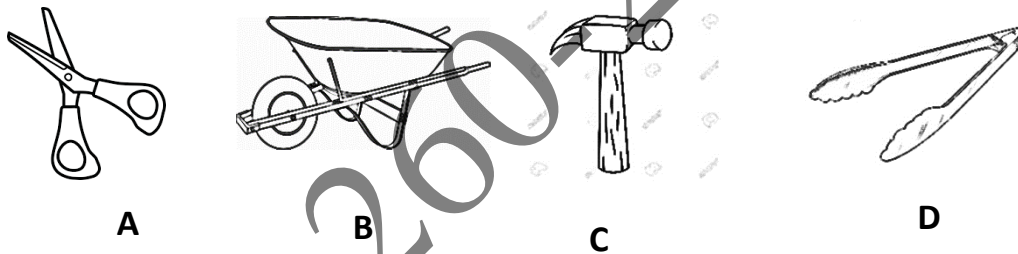


- i. Identify the above diagram [2 marks]
- ii. What gas do microbes release after decomposing dead matter? [2 marks]
- iii. Identify the parts labeled I and II in the diagram [2 marks]
- iv. What is fossilization? [4 marks]

(c) The diagram below shows three (3) types of solutions. Study the solutions and answer the following questions.



- i. State the outcome of placing red blood cells in each of the solutions. [3 marks]
- ii. What would be the results of the experiment if the red blood cells had been replaced with root hairs. [3 marks]
- iii. When too much fertilizer is applied to a plant is likely to wilt. What is the reason. [4 marks]
- (d) The following are examples of simple machines (levers). Study them carefully and answer the questions that follow.



- Identify the simple machines labelled A, B, C and D [2 marks]
- Identify the type of lever each of the simple machines depicted above belong to [4 marks]
- A man wanted to lift a rock occupying space on his farm. He has only a log to work with. What type of simple machine will he use and demonstrate how it makes his work easier? [4 marks]

## PART II

Answer only four (4) questions from this part

- Q2. (a) i. Explain what is meant by the term science.  
ii. Outline three (3) subjects that make up applied science [4 marks]
- (b) i. Outline two (2) characteristics each of the states of matter  
ii. Formation of frost and snow is based on what change of state of matter? [3 marks]
- (c) i. Give three (3) differences between plant and animal cells  
ii. Give two (2) functions of the plasmalemma. [4 marks]

- (d) i. Describe three physical properties of soil  
 ii. Give two importance of soil profile in crop production [4 marks]

- Q3. (a) i. List three physical quantities  
 ii. The diameter of Kofi's circular garden is 14cm. What is the area of the garden. [ $\pi=3.143$ ]  
 iii. If John's body temperature is  $98^{\circ}\text{C}$ . How low must his body temperature drop for him to attain standard body temperature. [4 marks]
- (b) i. Name and discuss three (3) hazards that can occur in teaching and learning science.  
 ii. How do you prevent the hazards stated in above? [4 marks]
- (c) i. State the stages in the life cycle of flowering plants  
 ii. Give two practical examples on why knowledge of flowering plants is important in vegetable crop production. [3 marks]
- (d) i. Explain the term vegetable crop  
 ii. Explain the effects of three factors considered in vegetable production. [4 marks]
- Q4. (a) i. Distinguish between the following farming systems  
 $\alpha$  mixed cropping and land rotation  
 $\beta$  mixed farming and mixed cropping  
 $\mu$  organic farming and crop rotation  
 ii. Give two (2) problems associated with land rotation. [4 marks]
- (b) i. Draw and label the respiratory system  
 ii. Explain three (3) factors that affect the rate of breathing [4 marks]
- (c) i. Give four examples of chemical changes that take place in the environment with egg frying exempted.  
 ii. Explain why frying an egg is not a physical change [4 marks]
- (d) i. Explain the terms Forward Bias and Reverse Bias  
 ii. What is the full meaning of LED with respect to simple electronics? [3 marks]
- Q5. (a) i. Give two (2) reasons why a fish from the sea may not survive in a fresh water environment  
 ii. Give two (2) importance of scavengers in the food chain. [4 marks]
- (b) i. Balance the following simple chemical equation  
 $\alpha.$   $\text{H}_2 + \text{O}_2 \longrightarrow$   
 $\beta.$   $\text{N}_2 + \text{H}_3 \longrightarrow$   
 $\mu.$   $\text{Mg} + \text{O}_2 \longrightarrow$   
 ii. Write the formula for calcium tetraoxosulphate (IV) [4 marks]

- (c) i. A solid object has a density of  $40\text{kg/m}^3$ . If this object is placed in a liquid which has a density of  $50\text{kg/m}^3$ , what will happen to the object?
- ii. Give four effects of force on a body. [4 marks]
- (d) i. Describe four practices that destroy water bodies
- ii. Explain the term water conservation? [3 marks]

Q6. (a) i. Discuss the composition of the following

$\alpha$ . earth

$\beta$ . moon

$\mu$ . sun

ii. Outline the relationship between the sun and earth in the milky way galaxy. [4 marks]

(b) i. Explain how plants convert energy from the sun with the help of carbon dioxide into food.

ii. Explain whether a plant with red leaves will photosynthesize or not. [4 marks]

(c) i. State two human activities that lead to air pollution

ii. List two possible effects of air pollution. [4 marks]

(d) Identify the scientific concept or principles in

$\alpha$ . kenkey making

$\beta$ . salt making

$\mu$ . Brewery [3 marks]

END OF PAPER

**DO NOT TURN OVER THIS PAGE  
UNTIL YOU ARE TOLD TO DO SO.**

**Answer all the questions.**

Each question is followed by four options lettered A to D. Find the correct option for each question and shade in pencil on your answer sheet the space which bears the same letter as the option you have chosen. Give only one answer to each question.

1. The particle of soil which gives a gritty feeling when rubbed between the fingers is
  - A. clay
  - B. sand
  - C. silt
  - D. loam
2. The physical property that refers to how rough or smooth a soil is known as,
  - A. capillarity
  - B. air content
  - C. water holding ability
  - D. texture
3. A collection of magnetic lines of force is known as
  - A. magnetic density
  - B. magnetic flux
  - C. magnetic field
  - D. field density
4. Meat, beans and dried fish are food typically rich in
  - A. starch
  - B. protein
  - C. fat
  - D. vitamins
5. A place where seedlings are raised before they are transplanted to the field is known as
  - A. the nursery
  - B. the vegetable farm
  - C. beds
  - D. flower pot
6. The transfer of heat through a solid medium is by  
I – Conduction II- Convection III- Radiation
  - A. I only
  - B. II only
  - C. III only
  - D. I and II only
7. Excess glucose in the body is converted into
  - A. urea
  - B. glycogen
  - C. fatty acid and glycerol
  - D. ammo acids
8. Which of the following nutrients is needed for the development of strong teeth?
  - A. Protein
  - B. Roughage
  - C. Calcium
  - D. Fats and oil
9. The planet Earth is located in a galaxy known as
  - A. constellation
  - B. meteorites
  - C. milky way
  - D. satellite
10. Which of the following methods of mosquito control requires high technical expertise?
  - A. Environmental method
  - B. Chemical method
  - C. Genetic method
  - D. Biological method
11. Soil erosion takes place when
  - A. Soil is limed
  - B. The land is ploughed
  - C. Soil nutrients are lost
  - D. Rainfall is heavy
12. Which of the following is the source of Salicylic
  - A. Vinegar
  - B. Grapes
  - C. Red ants
  - D. Aspirin
13. The efficiency of a machine is given by the ratio
  - A.  $\frac{\text{Load}}{\text{effort}}$

- B.  $\frac{\text{Momentum}}{\text{velocity}}$
- C.  $\frac{\text{Work input}}{\text{Work output}} \times 100$
- D.  $\frac{\text{Mechanical advantage}}{\text{Velocity ratio}} \times 100$
14. The force of attraction between molecules of different substances is called
- adhesion
  - cohesion
  - tension
  - viscosity
15. An example of a parasite which lives in the intestine of an animal is
- guinea worm
  - jigger
  - plasmodium
  - tapeworm
16. The purpose of vaccination is to
- kill disease-producing organisms in the body
  - increase the activity of white blood cells
  - induce the production of anti-bodies
  - cure the disease
17. A transistor whose middle layer is a P-type semiconductor is called
- PNP Transistor
  - NPN transistor
  - NPP transistor
  - PNN transistor
18. Electrical energy is measured in
- volts
  - ohms
  - joules
  - watt
19. A group of atoms that stay together as a charged unit is called
- isotope
  - radical
  - atom
  - ion
20. Which of the following gases is given out during photosynthesis?
- Carbon dioxide
  - Carbon monoxide
  - Nitrogen
  - Oxygen
21. Which of the following carry oxygenated blood to the cells and tissues of the body?
- Arteries
  - Capillaries
  - Veins
  - Hormones
22. When fish is dried, the fish loses water by
- transpiration
  - osmosis
  - diffusion
  - active transport
23. Which of the following happens during fertilization in humans?
- Membrane forms around the egg
  - Only one sperm fuse with the egg
  - The egg divides into two
  - The egg moves down into the egg tube
24. Relative humidity is usually expressed in
- percentage
  - millimeters
  - centimeters
  - degree celcius
25. Which of the following is not a fossil fuel?
- coal
  - Kerosene
  - Petrol
  - Sun
26. The simplest way of making well water suitable for laundry purpose is by
- Adding alum
  - boiling

- C. chlorination  
D. filtering
27. The method used to separate an insoluble solid from liquid is  
A. crystallization  
B. distillation  
C. filtration  
D. sublimation
28. Which of the following compounds is formed when copper burns in oxygen?  
A. CuO  
B. MgO  
C. CO<sub>2</sub>  
D. NH<sub>3</sub>
29. Which of the following alloys is used for making currency coins?  
A. Solder  
B. Cupronickel  
C. Duralumin  
D. Ni
30. The combining power of an element is called  
A. ion  
B. electron  
C. atom  
D. valency
31. The shedding of leaves of plants during the dry season protects them against  
A. bush fire  
B. plant-eating animals  
C. heat loss  
D. water loss
32. The eclipse of the moon occurs when the  
A. moon and the sun are in straight line  
B. earth and the sun are in straight line  
C. sun is between the earth and the moon  
D. earth is between the sun and the moon
33. A car battery produces electrical energy from  
A. chemical energy  
B. sound energy  
C. Kinetic energy  
D. Heat energy
34. The process by which living things obtain energy from food in their body cells is known as  
A. Tissue respiration  
B. Excretion  
C. Selective reabsorption  
D. Digestion
35. The farming system that involves the growing of the same crop on the same piece of land year after year is called  
A. Crop rotation  
B. Ecological farming  
C. Monocropping  
D. Monoculture
36. Which of the following crops is a fruit vegetable?  
A. Cabbage  
B. Carrot  
C. cassava  
D. Tomato
37. What type of fruit is a mango?  
A. Drupe  
B. Pepo  
C. Berry  
D. Caryopsis
38. Sickles are tools used for  
A. Pruning shrubs  
B. Harvesting cassava  
C. Harvesting rice  
D. Harvesting orange
39. Substances produced by a reaction are termed  
A. Raw materials  
B. reactants  
C. raw substances  
D. products
40. The human tooth that is chisel-shaped and used for biting food is  
A. canine  
B. incisors  
C. molar  
D. premolar