

May 2022
INTEGRATED
SCIENCE 2&1
Essay & Objective
2 hours

2 & 1

Name.....
Index Number.....

BEST BRAIN EXAMINATIONS KONSORTIUM GHANA

Special Private Mock Examinations For BECE Candidates

May 2022
INTEGRATED SCIENCE 2 & 1 2 hours

Do not open this booklet until you are told to do so. While you are waiting, read and observe the following instructions carefully. Write your name and index number in ink in the spaces provided above.

This booklet 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 1 hour 15 minutes after which the answer booklet will be collected. Do not start Paper 1 until you are told to do so. Paper 1 will last 5 minutes.



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

Answer all the questions in your answer booklet.

Answers will be given for clarity of expression and orderly presentation of material

SECTION A

[40 marks]

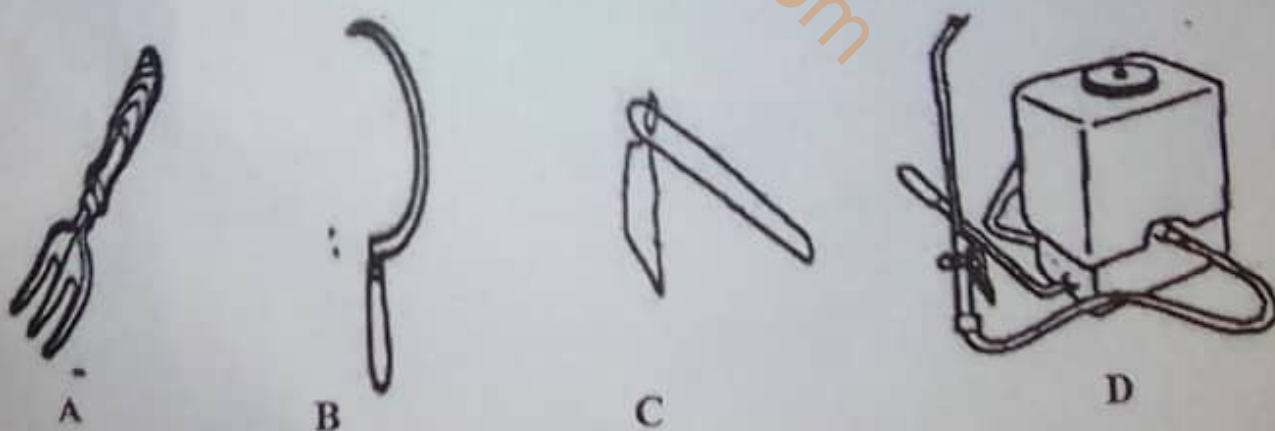
Answer all of Question 1

(a) The table below contains the first ten elements in the periodic table.

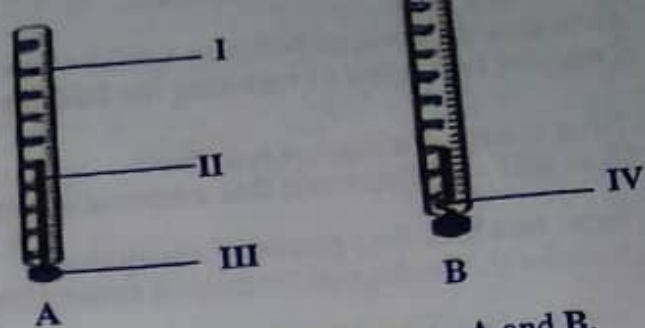
1.	2. Helium	3.	4. Beryllium	5. Boron
6.	7. Nitrogen	8.	9. Fluorine	10. Neon

- (i) Write the names and chemical symbols of elements 1, 3, 6 and 8. [2 marks]
- (ii) Draw the electronic structures of elements 1 and 8 in the table. [2 marks]
- (iii) What is the group name of elements 2 and 10 in the table above? [1 mark]
- (iv) Name the elements in the table above that are metals. [2 marks]
- (v) A common compound in everyday life is formed from a reaction between elements 1 and 8.
- (a) Name the substance formed; [1 mark]
- (β) Write a word equation for the reaction; [1 mark]
- (γ) Write a balanced chemical equation for the reaction. [1 mark]

(b) The diagrams below are illustrations of some farm tools. Study the diagrams carefully and answer the questions that follow.



- (i) Identify each of the tools labelled A, B, C and D. [2 marks]
- (ii) State the use of each of the tools labelled A, B, C and D. [2 marks]
- (iii) Briefly describe how tool A is used. [2 marks]
- (iv) State two ways of maintaining tool C. [2 marks]
- (v) State two precautions that must be taken when using D. [2 marks]



- (i) Identify the types of thermometers shown as A and B. [2 marks]
- (ii) Name the parts labeled I, II, III and IV. [2 marks]
- (iii) Give two reasons why II is suitable for use in most thermometers. [2 marks]
- (iv) State two reasons why water cannot be used in place of II. [2 marks]
- (v) State the principle on which thermometers A and B work. [2 marks]

(d) The diagram below shows the process of fertilization in a flowering plant. Study it carefully and answer the questions that follow.



- (i) Explain the process shown above. [2 marks]
- (ii) What is the end product of the process above? [2 marks]
- (iii) Identify the parts labeled I, II, III and IV. [2 marks]
- (iv) State the function of each of the parts labeled I and III. [2 marks]
- (v) Name and explain the process which occurs before the above. [2 marks]

SECTION B

[60 marks]

Answer four questions only from this part

- 2. (a) (i) What is *transplanting* in vegetable crop production? [1 mark]
- (ii) Give two activities needed to ensure successful transplanting. [2 marks]
- (iii) State two characteristics of a good vegetable seedling. [2 marks]
- (b) Methane burns in air to produce water and carbon dioxide. Write a balanced chemical equation for the reaction [2 marks]

Turn

- (c) (i) Explain **two** processes of heat transfer. [2 marks]
(ii) Describe **two** ways in which the thermos flask works to prevent any of the heat transfer processes. [2 marks]
- (d) (i) Give **two** differences between a *food chain* and a *food web*. [2 marks]
(ii) Describe **two** ways of restoring the balance in an ecosystem. [2 marks]
3. (a) (i) What is a *neutralization reaction*? [1 mark]
(ii) How will you determine that a neutralization reaction is complete? [2 marks]
- (b) (i) Name **two** breeding places of mosquitoes. [1 mark]
(ii) Describe the biological method of controlling mosquitoes. [2 marks]
- (c) (i) Give **two** benefits of soil in agriculture. [2 marks]
(ii) State **two** uses of soil water to plants. [2 marks]
(iii) Identify **two** harmful effects of bush burning on agricultural soils. [2 marks]
- (d) (i) Give **two** uses of knowledge of density in science. [2 marks]
(ii) Explain how sinking and floating are related to density. [1 mark]
4. (a) (i) Describe **two** ways by which seeds can be sown on beds. [2 marks]
(ii) List any **two** tools used in making vegetable beds. [1 mark]
(iii) Give **four** benefits of growing vegetables. [2 marks]
- (b) (i) What is a *solvent*? [1 mark]
(ii) Mention **two** industrial uses of solvents. [2 marks]
- (c) (i) How would you use a compass to determine the poles of a magnet? [2 marks]
(ii) Describe the stroking method of magnetization. [2 marks]
- (d) (i) What is a *light emitting diode (LED)*? [1 mark]
(ii) Give **two** uses of LEDs. [2 marks]
5. (a) (i) Explain **two** methods to separate liquid-liquid mixtures. [2 marks]
(ii) Describe **two** mixture separation methods used in gari processing. [2 marks]
- (b) Explain why the length of the year differs from planet to planet. [3 marks]
- (c) (i) Give **two** benefits of legumes in a crop rotation programme. [2 marks]
(ii) State **two** principles of crop rotation. [2 marks]
(iii) Mention **two** advantages of a crop rotation programme. [2 marks]
- (d) Explain why expired air contains more carbon (IV) oxide than inhaled air. [2 marks]
6. (a) (i) Name **four** parts of a human tooth and give the function of each. [2 marks]
(ii) Give **four** ways of preventing dental disorders. [2 marks]
- (b) Explain why the volume of water in a measuring cylinder rises when a stone is dropped into it. [3 marks]
- (c) (i) Explain why gas particles diffuse rapidly. [2 marks]
(ii) State **four** factors that determine the rate of diffusion. [2 marks]
- (d) (i) State **four** benefits of mixed farming. [2 marks]
(ii) Give **two** reasons for controlling weeds on your vegetable farm. [2 marks]

Answer all the questions.

Each question is followed by four options lettered A to D. Find out 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. An example is given below.

The element with the chemical symbol Si is

- A. Silver
- B. Silicon
- C. Selenium
- D. Sodium

The correct answer is Silicon, which is lettered B and therefore answer space B would be shaded.

shaded.

A

B

C

D

Think carefully before you shade the answer spaces. Erase completely any answer you wish to change.

Do all rough work on this paper.

Now answer the following questions.

1. Which of the following is the correct order of the last four of first twenty elements?
 - A. Chlorine, argon, potassium, calcium
 - B. Chlorine, potassium, argon, , calcium
 - C. Potassium, chlorine, argon, , calcium.
 - D. Calcium, potassium, chlorine, , argon
2. Which instrument would you use to determine the internal diameter of household water pipe?
 - A. Tape measure
 - B. Metre rule
 - C. Vernier callipers
 - D. Micrometre screw gauge
3. The fertility of a soil is determined by its ability to
 - A. hold more water.
 - B. supply right amounts of essential nutrients to plants.
 - C. hold plants firmly on the ground.
 - D. supply air and water for the plants to carry out photosynthesis.
4. An object will float on water if
 - A. its mass to volume ratio is less than that of water.
 - B. it contains less molecules than water.
 - C. its mass to volume ratio is more than that of water.
 - D. its mass to volume ratio is the same as that of water.
5. The alveoli are the structures in the respiratory system of humans where
 - A. internal respiration takes place.
 - B. gaseous exchange occurs.
 - C. oxygen is absorbed into the blood.
 - D. carbon dioxide is released from the heart.
6. The poles of a magnet are called north and south poles because they are
 - A. positive and negative.
 - B. at opposite ends of the magnet.
 - C. the coldest parts of the magnet.
 - D. lined up with the earth's north- south axis.
7. Water is **not** suitable to construct thermometer to read temperatures of about 180°C because
 - A. water boils below 180°C .
 - B. water boils above 180°C .
 - C. the temperature of water cannot reach 180°C .
 - D. water molecules evaporate at 180°C .

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8. In an electronic circuit, charge and discharge is the work of the
 A. light emitting diode.
 B. capacitor.
 C. inductor.
 D. switch.
9. For current to flow in an electric circuit,
 A. a bulb must be connected.
 B. the circuit should be open.
 C. the circuit should be closed.
 D. there must be connecting wires.
10. Blood clotting is an important natural mechanism that
 A. gives the blood its red colour.
 B. makes blood thick.
 C. prevents excessive loss of blood.
 D. helps the blood to flow.
11. There is no generation of heat when
 A. current flows through a bulb.
 B. the palms are rubbed together.
 C. sun radiations hit the earth.
 D. salt dissolves in water.
12. The force acting on mass due to the earth's gravity is termed
 A. weight.
 B. push.
 C. pull.
 D. resistance.
13. Water is prevented from passing through the tiny holes in an umbrella by
 A. osmosis.
 B. surface tension.
 C. tensional force.
 D. frictional force.
14. The following are uses of LED except
 A. for electronic indicators.
 B. in remote controls.
 C. as a source of power.
 D. for sign posts.
15. The gene is a structure in the cell which
 A. controls reproduction process.
 B. carries hereditary materials.
 C. controls internal respiration.
 D. transports oxygen.
16. The pulmonary artery carries
 A. deoxygenated blood to the lungs.
 B. oxygenated blood to the heart.
 C. oxygenated blood to the lungs.
 D. deoxygenated blood to the heart.
17. Which of the following organisms is a primary consumer?
 A. Goat
 B. Grass
 C. Dog
 D. Lion
18. Blood pressure can be measured using an instrument called
 A. Hygrometer
 B. Thermometer.
 C. Sphygmomanometer.
 D. Hydrometer.
19. Which of the following changes in a substance is **not** a physical change?
 A. Change of state. ✓
 B. Change of shape. ✓
 C. Change in temperature.
 D. Change of mass. ✓
20. In which of the following states of water are the particles far apart?
 A. Iced water
 B. Steam
 C. Iced block
 D. Water vapour
21. The teeth used to hold and tear food apart are
 A. incisors.
 B. molars.
 C. premolars.
 D. canines.
22. Chlorophyll dissolves in
 A. alcohol.
 B. water.
 C. benzene
 D. Carbon dioxide.
23. The basic component of a digital thermometer is
 A. water.
 B. alcohol.
 C. transistor.
 D. cell.
24. Petroleum is a mixture of
 A. solids and gases.
 B. liquids only.
 C. liquids and gases only.
 D. solids, liquids and gases.

25. Dropping a bar magnet repeatedly can increase its magnetic strength.
 A. demagnetize it.
 B. change the position of the poles.
 C. change the area of its magnetic field.
 D.
26. The respiratory station of a living cell is the
 A. nucleus.
 B. chloroplast.
 C. mitochondrion.
 D. vacuole.
27. Which of the following statements is true about the digital thermometer?
 A. It has no thermometric liquid.
 B. Its uses alcohol.
 C. Its thermometric liquid is water.
 D. It is graduated.
28. Transplanting of young seedlings is usually done in the evening because
 A. darkness promotes rapid growth.
 B. there is little pest attack in the evening.
 C. the rate of loss of water is less.
 D. seedlings do not need sunlight.
29. The most porous soil type is
 A. loam.
 B. sand.
 C. clay.
 D. organic.
30. Which of the following fruits is seedless?
 A. Mango.
 B. Pawpaw.
 C. Banana.
 D. Orange.
31. One effective use of the hand fork is for
 A. weeding.
 B. preparing mounds.
 C. stirring beds.
 D. pruning.
32. The solvent for coal tar is
 A. water.
 B. oil.
 C. benzene.
 D. alcohol.
33. Pure water is naturally
 A. acidic.
 B. basic.
 C. salty.
 D. neutral.
34. Catarrh or common cold is a disorder of the
 A. circulatory system.
 B. respiratory system.
 C. digestive system.
 D. reproductive system.
35. Nitrogen in soil promotes the growth of
 A. flowers.
 B. fruits.
 C. leaves.
 D. roots.
36. Stainless steel has the property of
 A. high tensile strength.
 B. high ductility.
 C. high resistance to corrosion.
 D. extreme brittleness.
37. Rice grains in water can be separated by
 A. distillation.
 B. sieving.
 C. evaporation.
 D. using separatory funnel.
38. Primary consumers in an ecosystem
 A. produce oxygen to support life.
 B. begin the simple food chain.
 C. produce their own food.
 D. supply carbon dioxide.
39. Which of the following types of teeth is absent in herbivores?
 A. Canines
 B. Incisors
 C. Premolars
 D. Molars
40. The two elements that form methane are
 A. carbon and hydrogen.
 B. carbon and nitrogen.
 C. hydrogen and nitrogen
 D. mercury and hydrogen.

END OF PAPER