09010021/2&1 BBEKO
October 2021
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

October 2021 **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* **45** *minutes.*

1¼ hours

PAPER 2
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 answer booklet.*

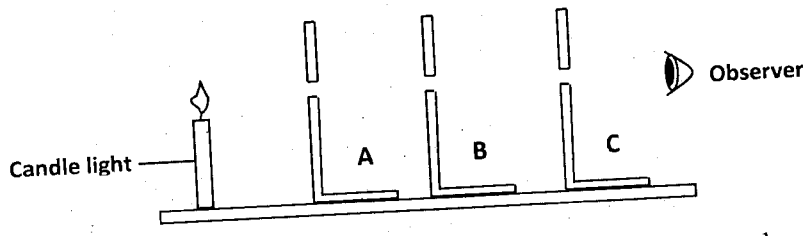
Credit will be given for clarity of expression and orderly presentation of material

SECTION A
[40 marks]

Answer **all** *of Question* **1**

1. **(a)** The diagram below is used to demonstrate a phenomenon of light.

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



(i) What will the observer see in the set-up above? [2 marks]

(ii) Name and explain the phenomenon being investigated. [2 marks]

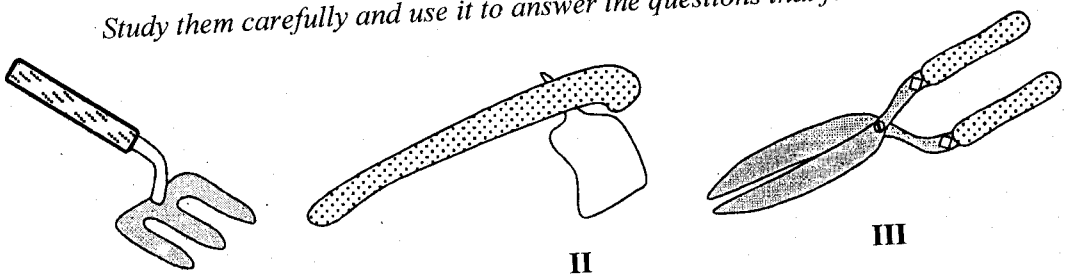
(iii) If the centre card is shifted slightly sidewards, state and explain what observation would be made. [2 marks]

(iv) If a plane glass and a coloured plastic were each placed in turn between the light and card **B**, state and explain what observations would be made. [2 marks]

(v) If another card without a hole was placed between the cards and the light, state and explain what observation would be made. [2 marks]

(b) The diagram below is an illustration of some farm tools.

Study them carefully and use it to answer the questions that follow.



I **II** **III**

(i) Identify the tools labeled **I, II** and **III.** [3 marks]

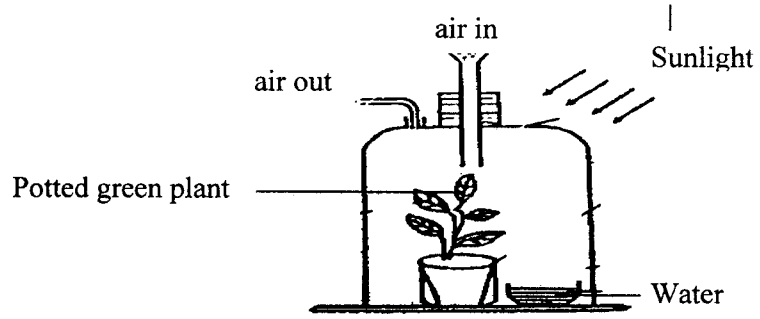
(ii) State one use of each of the tools labeled **I, II** and **III.** [3 marks]

(iii) Mention **two** ways of maintaining the farm tools above. [2 marks]

(iv) Give **two** reasons we need to maintain these tools. [2 marks]

(c) In an experiment to demonstrate photosynthesis, the set-up in diagram below was left to stand for two days.

Study the set-up carefully and answer the questions that follow.



(i) Give **four** reasons why photosynthesis will occur in the set-up above. [2 marks]

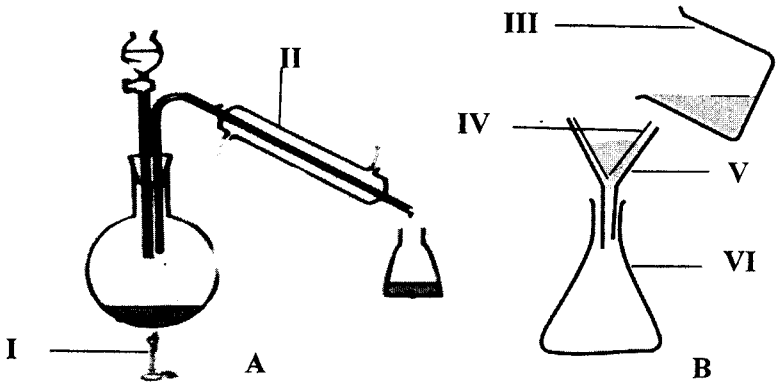
(ii) What is the role of sunlight in the process above? [2 marks]

(iii) State **four** steps to test for the main product of photosynthesis. [4 marks]

(iv) Name the by-product of photosynthesis and state how you would test for it. [2 marks]

(d) The diagrams below illustrate two different methods of separation of mixtures.

Study the diagrams carefully and answer the questions that follow.



(i) Name and explain the separation methods labeled **A** and **B** above. [2 marks]

(ii) Identify the apparatus labeled **I, II, III, IV, V** and **VI.** [3 marks]

(iii) State the use of each of the apparatus labeled **I, II** and **IV.** [3 marks]

(iv) Explain the role of heat in one of the separation methods above. [2 marks]

SECTION B

[60 marks]

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

2. **(a)** (i) Give the function of **three** parts of the human female reproductive system. [3 marks]

(ii) Give the function of **three** parts of the human male reproductive system. [3 marks]

(b) (i) Explain why solids cannot be compressed easily. [1 mark]

(ii) Why is it that you cannot fetch water with a basket? [1 mark]

(iii) Explain why gases cannot be kept in an open cup. [1 mark]

Turn over

(c) Describe how the following are used to produce electricity:
(i) wind turbines; [2 marks]
(ii) nuclear power plant. [2 marks]

(d) (i) State **four** uses of soil to plants. [2 marks]
(ii) Identify **two** organic sources of crop nutrition. [2 marks]

3. (a) (i) Explain why an atom is electrically neutral. [1 mark]
(ii) State **two** differences between a proton and an electron. [2 marks]
(iii) Explain why Neon does not react with other elements. [1 mark]

(b) (i) Describe the **four** main stages in the life of a mosquito. [2 marks]
(ii) Give **two** environmental methods of controlling mosquitoes. [2 marks]

(c) (i) Explain the canning method of food processing. [1 mark]
(ii) Name **four** vegetables that can be processed by canning. [2 marks]

(d) (i) What is *capillary action*? [1 mark]
(ii) Give **three** examples of capillary action in everyday life. [3 marks]

4. (a) (i) With the aid of a labeled diagram only, show the two types of transistors. [3 marks]
(ii) Explain the difference between *forward bias* and *reverse bias* in a p-n junction diode [2 marks]

(b) Sodium metal is exposed to dry air.
(i) Write a word equation for the chemical reaction. [2 marks]
(ii) Write a balanced chemical equation for the chemical reaction. [3 marks]

(c) (i) Describe the three types of consumers in an ecosystem. [3 marks]
(ii) Mention **three** adaptive features of tilapia and the function of each.

(d) Explain the following cultural practices in vegetable crop production:
(i) Weeding; [2 marks]
(ii) Mulching.

5. (a) Draw a simple labelled diagram of the left and right lung showing the ***trachea***, ***bronchus*** and the ***bronchioles***. [4 marks]

(b) (i) Mention **two** applications of pressure in everyday life. [2 marks]
(ii) Explain why it is important to sharpen a knife before use. [1 mark]

(c) (i) State **four** properties of an acid. [2 marks]
(ii) State **four** properties of a base. [2 marks]

(d) (i) Describe **two** ways by which seeds can be sown on beds. [2 marks]
(ii) Give **two** benefits of raised beds in vegetable crop production. [2 marks]

6. (a) (i) Explain the difference between *tooth plaque* and *tooth decay*. [2 marks]
(ii) Give **four** ways of preventing dental disorders. [2 marks]

(b) (i) Explain the condition under which an object may float or sink in water. [2 marks]
(ii) Describe **two** features of a wooden boat that makes it suitable for fishing. [2 marks]

(c) (i) Describe how you can prepare a saturated sugar solution in the laboratory. [2 marks]
(ii) How would you separate the parts of sugar solution in the laboratory? [2 marks]

(d) (i) Give **two** symptoms of the swollen shoot disease in a cocoa plant. [1 mark]
(ii) State **two** ways to control the swollen shoot disease in a cocoa plant. [2 marks]

END OF ESSAY TEST

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

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

PAPER 1 — 45 minutes

OBJECTIVE TEST

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

Answer all the questions on your Objective Test answer sheet.

1. Use 2B pencil throughout
2. On the pre-printed answer sheet, check that the following details are **correctly** printed: Your **surname** followed by your **other names**, the *Subject Name*, your *Index Number*, *Centre Number* and the *Paper Code*.
3. In the boxes marked Candidate Number, Centre Number and Paper Code, **reshade** each of the shaded spaces.
4. An example is given below. This is for a candidate whose name is Seyram BABANAWO. Her index number is 772384188 and she is writing the examination at Centre Number 77234.

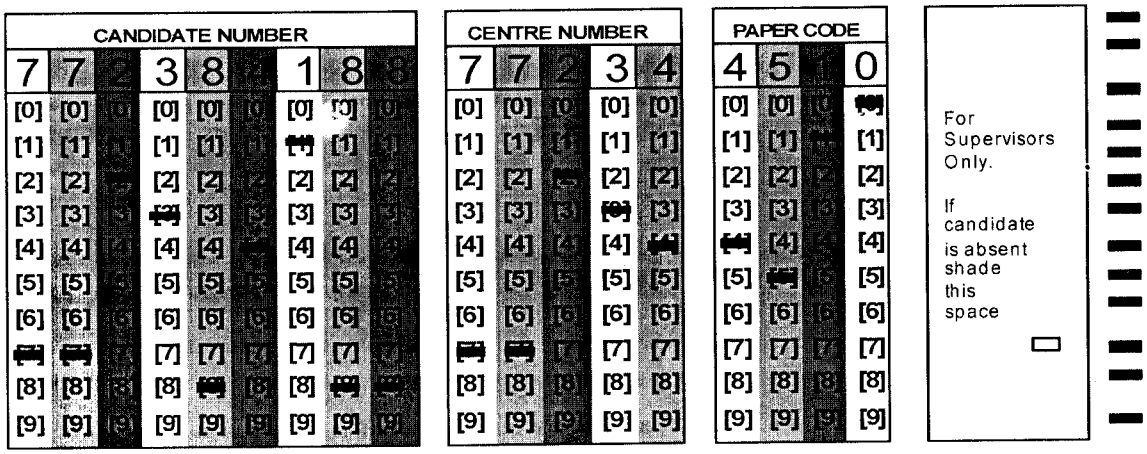
BEST BRAIN EXAMINATION KONSORTIUM
SPECIAL PRIVATE MOCK FOR BECE CANDIDATES
OBJECTIVE ANSWER SHEET.

CANDIDATE NAME:	SUBJECT:
SEYRAM BABANAWO	INTEGRATED SCIENCE

1. Use HB Pencil Press firmly
2. Answer each question by choosing one letter and then, shade through the letter chosen like this

   [A] [B] [C] [D] [E]

3. If you want to change an answer, rul out your First mark completely
4. If only four alternative answers are given for each question, ignore the letter E
5. Your question paper may have fewer than 60 Questions.



*Answer **all** the following 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*

[A] [■ B] [C] [D]

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

Do all rough work on this paper.

Now answer the following questions.

1. When the load distance is greater than the effort distance in a simple machine,
   A. it makes work easy.
   B. it makes work difficult.
   C. no work can be done.
   D. work input is equal to work output.
2. The alveoli is a structure in the body
   A. which absorbs nutrients from the small intestine into the blood.
   B. where waste products of digestion are removed from the stomach.
   C. where gaseous exchange takes place between air and blood in the lungs.
   D. directs oxygen from the atmosphere to the blood.
3. Which of the following is **true** about the states of matter?
   A. Molecules in a solid are disorderly arranged.
   B. Solids are highly compressible.
   C. Liquids have definite form and volume.
   D. Molecules in a gas move faster than those in a liquid.
4. Plants pollinated by wind usually
   A. have brightly coloured petals.
   B. possess powdery pollen grains.
   C. are heavily scented.
   D. produce a lot of nectar.
5. The process of respiration in living cells does **not**
   A. lead to release of energy.
   B. involve the use of oxygen.
   C. take place at all times.
   D. involve the use of carbon dioxide.
6. The base-emitter junction in an n-p-n is forward biased because
   A. the n-type collector is connected to the positive terminal of the battery.
   B. the n-type collector is connected to the negative terminal of the battery.
   C. the p-type collector is connected to the neutral terminal of the battery.
   D. the p-type collector is not connected to any terminal of the battery.
7. An atom of mass number 13 has 7 neutrons in its nucleus. How many electrons are in its outermost shell?
   A. 6
   B. 7
   C. 4
   D. 2
8. Which of the following substances is neither an acid nor a base?
   A. H_2SO_4.
   B. NaOH.
   C. HCl.
   D. $CaCl_2$.
9. Which of the following diseases **cannot** be spread when the infected person coughs openly into the air?
   A. HIV/AIDS
   B. Tuberculosis
   C. Covid 19
   D. Measles.

10. The use of an emitter in a transistor is to
    A. supply negative charges called electrons.
    B. pull the electrons from the emitter.
    C. allow the current to flow through to the base.
    D. supply positive charges called electrons.
11. Which of the following is true about the properties of water?
    A. It is a good conductor of heat.
    B. It is a good conductor of electricity.
    C. It has a low surface tension.
    D. It is a universal solvent.
12. When an atom having two electrons in its outermost shell loses all two electrons, it forms an ion with
    A. two positive charges.
    B. two negative charges.
    C. one positive charge and one negative charge.
    D. zero charge.
13. Constipation and indigestion can be prevented by
    A. eating lots of carbohydrate.
    B. eating regularly.
    C. fasting.
    D. drinking lots of sugary juices.
14. Soil profile helps the farmer to determine the following **except**
    A. amount of organic manure in soil.
    B. depth of soil.
    C. soil fertility.
    D. water-holding capacity of soil.
15. The charge carriers in a p-type semiconductor are mostly
    A. protons.
    B. electrons.
    C. neutrons.
    D. neutral particles.
16. Which of the following substances is **not** a mixture?
    A. Sugar solution
    B. Salt solution
    C. Water
    D. Air.
17. The reason why gaps are left in the joints of railway lines is to
    A. check over speeding.
    B. reduce the cost of metals used in construction.
    C. create enough room for bolts and knots.
    D. make room for the expansion of metals.
18. Which of the following statements about a plant cell is **true**?
    A. It contains a few large vacuoles.
    B. It is surrounded by a cell membrane only.
    C. It does not have a definite shape.
    D. It does not have a nucleus.
19. The two planets between the sun and the earth are
    A. Mercury and Mars.
    B. Mars and Venus
    C. Mercury and Venus
    D. Venus and Jupiter.
20. The part of the tooth that holds it firmly in the jawbone is the
    A. crown.
    B. dentine
    C. cement.
    D. pulp cavity.
21. Which of the following parts of the human reproductive system is internal?
    A. Testis
    B. Vagina
    C. Vulva
    D. Penis.

Turn over

22. Arteriosclerosis is a disease of the
A. digestive system.
B. reproductive system.
C. respiratory system.
D. circulatory system.

23. The systematic name for Cu_2O
A. copper (I) oxide.
B. copper (II) oxide.
C. copper (III) oxide.
D. copper (IV) oxide.

24. Wood ash is basically
A. acidic.
B. basic.
C. neutral.
D. salty.

25. We prevent tooth decay by
A. eating very hot food.
B. keeping the mouth hydrated.
C. smoking heavily.
D. eating a lot of sugary foods.

26. The crown and root of the tooth meet at the
A. dentine.
B. neck.
C. pulp cavity.
D. periodontal membrane.

27. The image formed by a plane mirror is **not**
A. virtual
B. laterally inverted.
C. of the same size as the object.
D. closer behind the mirror than in front.

28. The knowledge of soil texture is important because it
A. influences plant population.
B. determines the planting distance.
C. determines the type of crop to grow.
D. helps in pest control.

29. The larvae for mosquito have a pair of spiracles for
A. biting.
B. gaseous exchange.
C. movement.
D. floating on the surface of water.

30. The number of oxygen atoms in four molecules of water is
A. 2
B. 4
C. 8
D. 1

31. The presence or absence of electric current in an electronic circuit is indicated by the
A. battery.
B. capacitor.
C. inductor.
D. LED.

32. In gardening, the rake is mainly used for
A. harvesting.
B. leveling.
C. making moulds.
D. turning compost.

33. Which of the following statements is **not** true about weather?
A. It varies with time.
B. It is not measurable.
C. It covers small area.
D. It is a short term phenmenon.

34. The sharpening of cutting tools is made possible by the force of
A. magnetism.
B. friction.
C. gravity.
D. capillarity.

35. The farming system which involves the growing of one type of crop on the same piece of land every season is known as
A. mixed cropping.
B. mixed farming.
C. monocropping.
D. monoculture.

36. The part of an electrical circuit that controls current in the circuit is called
A. voltmetre.
B. cell.
C. rheostat.
D. resistor.

37. The chemical formula of nitrogen (II) oxide is
A. NO
B. NO_2
C. N_20
D. N_2O_2.

38. The energy transformation that takes place in the resistor of an electrical circuit is
A. chemical to electrical.
B. electrical to heat.
C. electrical to chemical.
D. chemical to heat.

39. Which of the following statements about bases is **not** correct?
A. They turn red litmus paper blue.
B. They can be organic or inorganic.
C. They neutralize acids.
D. They react with salts to produce acids.

40. The arrow in the circuit symbol of either n-p-n or p-n-p transistor is always on the
A. emitter lead
B. collector lead
C. base lead
D. neutral lead

END OF PAPER