

033/2&1 BECE  
June 2018  
INTEGRATED  
SCIENCE 2&1  
Essay and Objective  
2 hours

**2&1**

THE WEST AFRICAN EXAMINATIONS COUNCIL

GHANA

Basic Education Certificate Examination

June 2018

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.*

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

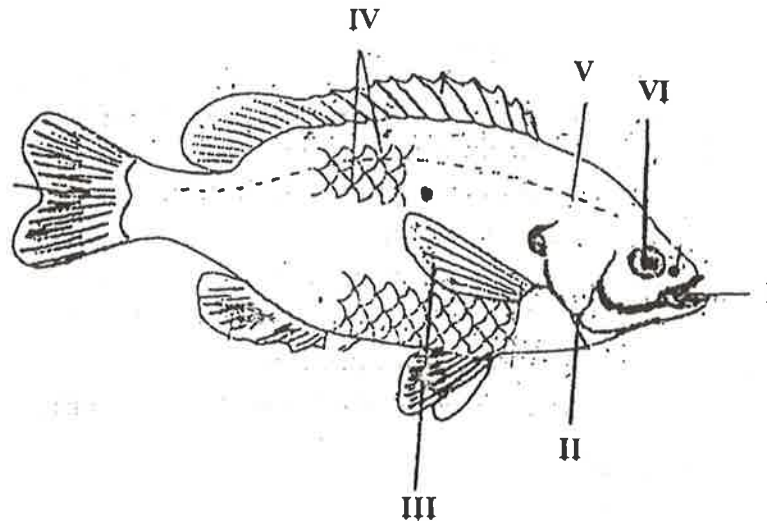
Credit will be given for clarity of expression and orderly presentation of material.

SECTION A  
[40 marks]

Answer **all** of Question 1.

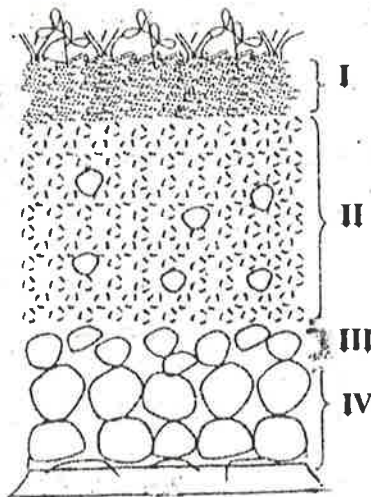
1. (a) The diagram below is an illustration of a fish.

Study the diagram carefully and answer the questions that follow.



- (i) Identify the fish. [1 mark]
- (ii) Name **each** of the parts labelled I, II, IV, V [4 marks]
- (iii) Name the habitat of the fish. [1 mark]
- (iv) Explain how **each** of the parts labelled III and VI enables the fish adapt to its habitat. [4 marks]

- (b) The diagram below is an illustration of a section through the soil.  
Study the diagram carefully and answer the questions that follow.



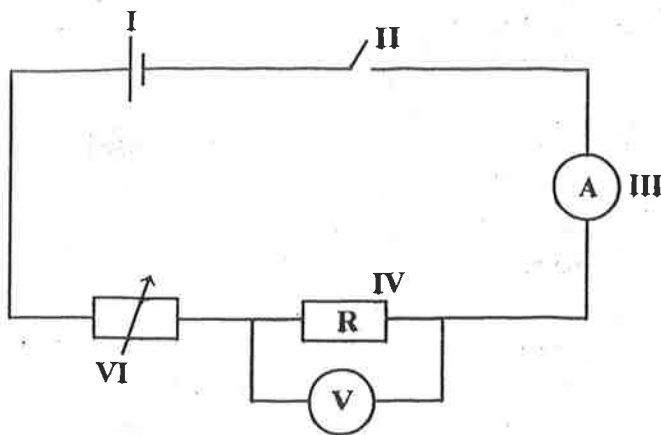
- (i) What does the diagram represent? [1 mark]
- (ii) Name **each** of the parts labelled I, II, III, IV. [4 marks]
- (iii) Which part of the diagram:
- (α) is the **richest** in humus? [1 mark]
- (β) is the habitat for soil organisms? [1 mark]
- (γ) undergoes weathering? [1 mark]
- (iv) What is the effect of heavy rainfall on the part labelled I? [1 mark]

So

fertility

(c) The diagram below is an illustration of an electrical circuit.

Study the circuit and answer the questions that follow.



- (i) Name **each** of the parts labelled I, II, IV, VI. [4 marks]
- (ii) State the energy transformation that takes place in:
  - (α) I [2 marks]
  - (β) IV [2 marks]
- (iii) State the S.I units of the quantity measured by **each** of the parts labelled
  - (α) III; [1 mark]
  - (β) V. [1 mark]
- (iv) State the function of the part labelled VI. [1 mark]

(d) In an experiment, equal volumes and equal concentrations of dilute hydrochloric acid and dilute sodium hydroxide solutions were **each** placed in different test tubes.

Read the following statements carefully.

- I. Both red and blue litmus papers were dipped into **each** of the solutions in turns.
- II. Equal volumes of the solutions were mixed to obtain a third solution.
- III. Both red and blue litmus papers were dipped into the third solution.

Use the information provided to answer the following questions.

- (i) Explain **briefly** how you can identify **each** of the solutions.
  - (α) Hydrochloric acid; [2 marks]
  - (β) Sodium hydroxide. [2 marks]
- (ii) State the type of reaction that occurred when the two solutions were mixed. [1 mark]
- (iii) What type of solution was formed when the reaction stated in (ii) occurred? [1 mark]
- (iv) State what would be observed when **both** red and blue litmus papers were dipped into the third solution. [2 marks]
- (v) Explain how the solid portion of the solution named in (iii) could be obtained. [2 marks]

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

2. (a) (i) What is an *ion*?  
(ii) State **two** methods of softening hard water. [4 marks]
- (b) (i) Differentiate between *pests* and *parasites* as used in agriculture.  
(ii) Give an example **each** of a:  
( $\alpha$ ) pest;  
( $\beta$ ) parasite [4 marks]
- (c) (i) What is *work*?  
(ii) A force of 10 N causes a body to move a distance of 5.2 m in the direction of the force. Calculate the work done. [5 marks]
- (d) Name **two** diseases associated with the circulatory system of humans. [2 marks]
3. (a) (i) What is *malnutrition*?  
(ii) State **one** symptom **each** of the following deficiency disease:  
( $\alpha$ ) scurvy;  
( $\beta$ ) rickets. [4 marks]
- (b) Draw the potassium atom and show the distribution of electrons in its shells. [K = 19] [4 marks]
- (c) (i) Define *potential energy*.  
(ii) An object of mass 10 kg is moving at a velocity of  $2 \text{ ms}^{-1}$ . Calculate the kinetic energy of the object. [5 marks]
- (d) State **one** example **each** of:  
(i) macro nutrients;  
(ii) micro nutrients. [2 marks]
4. (a) (i) Explain the term *hazard*.  
(ii) List **two** safety precautions against hazards in the teaching and learning of science. [4 marks]
- (b) In a tabular form state **three** differences between *osmosis* and *diffusion*. [3 marks]
- (c) (i) What is *weather*?  
(ii) State **two** differences between *weather* and *season*. [4 marks]
- (d) (i) What is a *fertile soil*?  
(ii) State **two** factors that cause loss of soil fertility. [4 marks]

Current

Turn over

5. (a) (i) What is a *magnetic field*?  
(ii) Name **two** methods of making magnets. [4 marks]
- (b) Explain **briefly** the term *teenage pregnancy*. [3 marks]
- (c) Write the formula for **each** of the following compounds:  
(i) calcium chloride;  
(ii) copper (I) oxide;  
(iii) nitrogen (IV) oxide;  
(iv) ammonia. [4 marks]
- (d) (i) List **three** physical properties of soil.  
(ii) What is the texture of clayey soil? [4 marks]
6. (a) (i) What are *derived quantities*?  
(ii) State the S.I units of the following quantities:  
( $\alpha$ ) area;  
( $\beta$ ) volume. [4 marks]
- (b) (i) State **two** factors necessary for photosynthesis.  
(ii) Explain the functions of **each** of the factors stated in (i). [4marks]
- (c) Explain **each** of the following terms:  
(i) soft water;  
(ii) hard water. [4 marks]
- (d) State **three** reasons why some seeds are nursed. [3 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.**

June 2018

INTEGRATED SCIENCE 1  
[40 marks]

45 minutes

*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 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.*

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 Joan Esi AMU. Her *index number* is 772384188 and she is writing the examination at *Centre Number* 77234. She is offering *Integrated Science 1* and the *Paper Code* is 0331.

## THE WEST AFRICAN EXAMINATIONS COUNCIL, GHANA BASIC EDUCATION CERTIFICATE EXAMINATION OBJECTIVE ANSWER SHEET

CANDIDATE NAME: <b>AMU JOAN ESI</b>	SUBJECT: <b>INTEGRATED SCIENCE 1</b>
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<ol style="list-style-type: none"> <li>1. Use 2B pencil. Press firmly.</li> <li>2. Answer each question by choosing one letter and then shade through the letter chosen like this:  <math>A \Rightarrow</math> <math>C \Rightarrow</math> <math>D \Rightarrow</math> <math>E \Rightarrow</math></li> <li>3. If you want to change an answer, erase</li> </ol>	<ol style="list-style-type: none"> <li>your first mark completely.</li> <li>4. If only four alternative answers are given for each question, ignore the letter E.</li> <li>5. Your question paper may have fewer than 60 questions.</li> </ol>
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CANDIDATE NUMBER	CENTRE NUMBER	PAPER CODE	For Supervisors only. If candidate is absent shade this space.
<b>7 7 2 3 8 4 1 8 8</b>	<b>7 7 2 3 4</b>	<b>0 3 3 1</b>	
0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0	
1 1 1 1 1 1 1 1 1	1 1 1 1 1	1 1 1 1	
2 2 2 2 2 2 2 2 2	2 2 2 2 2	2 2 2 2	
3 3 3 3 3 3 3 3 3	3 3 3 3 3	3 3 3 3	
4 4 4 4 4 4 4 4 4	4 4 4 4 4	4 4 4 4	
5 5 5 5 5 5 5 5 5	5 5 5 5 5	5 5 5 5	
6 6 6 6 6 6 6 6 6	6 6 6 6 6	6 6 6 6	
7 7 7 7 7 7 7 7 7	7 7 7 7 7	7 7 7 7	
8 8 8 8 8 8 8 8 8	8 8 8 8 8	8 8 8 8	
9 9 9 9 9 9 9 9 9	9 9 9 9 9	9 9 9 9	

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. An example is given below.

Which of the following substances is not an element?

- A. Aluminium
- B. Ammonia
- C. Oxygen
- D. Sodium

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

A

B

C

D

E

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

Do all rough work on this question paper.

Now answer the following questions.

1. The space occupied by matter is its
  - A. area.
  - B. mass.
  - C. volume.
  - D. weight.
  
2. Which of the following structures contain cellulose?
  - A. Cell wall
  - B. Cell membrane
  - C. Chloroplast
  - D. Mitochondrion
  
3. Which of the following activities are cultural practices used in tomato cultivation?
  - I. Pest control
  - II. Pricking out
  - III. Fertilizer application
  - A. I and II only
  - B. I and III only
  - C. II and III only
  - D. I, II and III

4. The farming system that makes effective use of available soil nutrients in a growing season is
- crop rotation.
  - land rotation.
  - mixed cropping.
  - mixed farming.
5. Which of the following members in a food chain will receive the least energy?
- Lizard
  - Grass
  - Grasshopper
  - Hawk
6. Digestion of fats and oils in humans starts in the
- colon.
  - gullet.
  - mouth.
  - duodenum.
7. What is the chemical symbol for silver?
- Ag
  - Au
  - Si
  - S
8. The process by which gas changes to liquid is known as
- melting.
  - evaporation.
  - condensation.
  - boiling.
9. Which of the following substances is acidic?
- Wood ash
  - Salt-petre
  - Bee stings
  - Bicarbonate of soda
10. The basic unit of life is the
- cell.
  - nucleus.
  - organ.
  - tissue.
11. Useful materials in food that provide growth and repair of worn out tissues are called
- carbohydrates.
  - vitamins.
  - proteins.
  - fats.

12. In human reproduction, the sperm fertilizes the female egg to form the
- A. zygote.
  - B. follicle.
  - C. ovary.
  - D. ovum.

Use the information below to answer questions 13 to 15.

A solid **X** reacted with a liquid **Y** to form a salt and water only. A portion of liquid **Y** turned blue litmus paper red. Solid **X** did not dissolve when a portion of it was placed in water and stirred.

13. Solid **X** could be said to be

- A. an acid.
- B. an alkali.
- C. a base.
- D. a salt.

14. Liquid **Y** is

- A. an acid.
- B. an alkali.
- C. a base.
- D. a metal.

15. If red litmus paper is placed in liquid **Y**, the colour of the paper will

- A. remain the same.
- B. change to blue.
- C. change to purple.
- D. become brighter.

16. The type of soil which becomes water-logged after rainfall is made up of a large amount of

- A. silt.
- B. sand.
- C. gravel.
- D. clay.

17. Ringworm is a disease which attacks the

- A. skin.
- B. lungs.
- C. liver.
- D. kidneys.

18. The most appropriate practice to adopt when growing vegetables in the dry season is

- A. watering.
- B. transplanting.
- C. pest control.
- D. fertilizer application.

19. Which of the following organisms improves soil fertility?
- Caterpillar
  - Millipede
  - Nematode
  - Rat
20. The introduction of natural enemies to control pests on a field is a
- physical control method.
  - cultural control method.
  - chemical control method.
  - biological control method.
21. A body has a density of  $30 \text{ g cm}^{-3}$  and volume of  $6 \text{ cm}^3$ . Determine the mass of the body.
- 180.0 g
  - 24.0 g
  - 5.0 g
  - 0.2 g
22. The force which tends to pull an object in a circular motion towards the centre of the circle is called
- centripetal force.
  - electrostatic force.
  - gravitational force.
  - magnetic force.
23. The swollen shoot disease of cocoa is caused by
- fungus.
  - virus.
  - bacteria.
  - protozoa.
24. The instrument used to measure atmospheric pressure is called
- a thermometer.
  - a force meter.
  - a barometer.
  - an anemometer.
25. The systematic name of  $\text{NO}_2$  is
- nitrogen oxide.
  - nitrogen (I) oxide.
  - nitrogen (II) oxide.
  - nitrogen (IV) oxide.

26. Which of the following simple machines is a second class lever?
- A. Bottle top opener
  - B. Claw hammer
  - C. Fishing rod
  - D. Pair of pliers
27. A cylindrical metal has radius 7 cm and height 2 cm. Determine the volume of the cylinder.  
[Take  $\pi = \frac{22}{7}$ ]
- A. 44 cm<sup>3</sup>
  - B. 107 cm<sup>3</sup>
  - C. 308 cm<sup>3</sup>
  - D. 1078 cm<sup>3</sup>
28. Which of the following statements are true of compounds?
- I. They are homogenous
  - II. Their constituents are present in fixed ratio by mass
  - III. Their constituents keep their individual properties
- A. I and II only
  - B. I and III only
  - C. II and III only
  - D. I, II and III
29. Which of the following factors contribute to early parenthood?
- I. Illiteracy
  - II. Poverty
  - III. Peer pressure
  - IV. Lack of parental care
- A. I and II only
  - B. II and III only
  - C. III and IV only
  - D. I, II, III and IV
30. Which of the following statements about the negative use of Science and Technology is correct? It
- A. promotes good health.
  - B. promotes easy communication.
  - C. enable humans to use less energy in working.
  - D. creates things that are dangerous to the environment.
31. Which of the following nutrients is needed by plants in small quantities?
- A. Calcium
  - B. Iron
  - C. Potassium
  - D. Magnesium

32. Which of the following statements about shadow formation is **correct**? It shows that light rays can
- A. be diffused.
  - B. travel in a straight line.
  - C. be refracted.
  - D. be reflected.
33. The colour of the neutral wire in an electrical circuit is
- A. blue.
  - B. brown.
  - C. green.
  - D. yellow.
34. A metal displaces  $5.0 \text{ cm}^3$  of water when it is totally immersed. If the mass of the metal is  $35.0 \text{ g}$ , calculate its density.
- A.  $7.0 \text{ g cm}^{-3}$
  - B.  $30.0 \text{ g cm}^{-3}$
  - C.  $40.0 \text{ g cm}^{-3}$
  - D.  $175.0 \text{ g cm}^{-3}$
35. Which of the following physical properties of water are **correct**? Water
- I. is a colourless liquid:
  - II. is a universal solvent.
  - III. boils at  $100 \text{ }^\circ\text{C}$  at standard atmospheric pressure.
  - IV. has a density of  $5 \text{ kg cm}^{-3}$  at  $4 \text{ }^\circ\text{C}$ .
- A. I and II only
  - B. II and III only
  - C. I, II and III only
  - D. II, III and IV only
36. The relative proportions of the different particle sizes in a soil sample refer to soil
- A. temperature.
  - B. texture.
  - C. structure.
  - D. porosity.
37. Which of the following chemical equations is balanced?
- A.  $\text{K} + \text{O}_2 \rightarrow \text{K}_2\text{O}$
  - B.  $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$
  - C.  $\text{Na} + \text{Cl}_2 \rightarrow \text{NaCl}$
  - D.  $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$

38. Heat is transferred along an iron bar by
- A. absorption.
  - B. conduction.
  - C. convection.
  - D. radiation.
39. The second stage in the life cycle of a mosquito is the
- A. egg.
  - B. imago.
  - C. larva.
  - D. pupa.
40. The function of the platelets in the circulatory system of humans is to
- A. transport oxygen.
  - B. transport carbon dioxide.
  - C. defend the body.
  - D. clot the blood.

**END OF PAPER**