THE WEST AFRICAN EXAMINATIONS COUNCIL
GHANA

Basic Education Certificate Examination

June 2025 — SCIENCE 2&1 — 2 hours 10 minutes

ESSAY AND OBJECTIVE

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* **25** *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.*

PAPER 2

ESSAY

[100 MARKS]

Answer **all** *the questions in your answer booklet.*

This paper is in **two** *sections:* **A** *and* **B**. *Answer Question* **1** *in Section* **A** *and any other* **three** *questions in Section* **B**.

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

SECTION A

[40 marks]

Answer **all** *the questions in this section*

1. (*a*) Figure **1**(*a*) is an illustration of a natural cycle showing unnamed stages and processes labelled **A**, **B**, **C** and **D** with processes labelled **P**, **Q**, **S** and **T**. Study the figure carefully and answer the questions that follow.

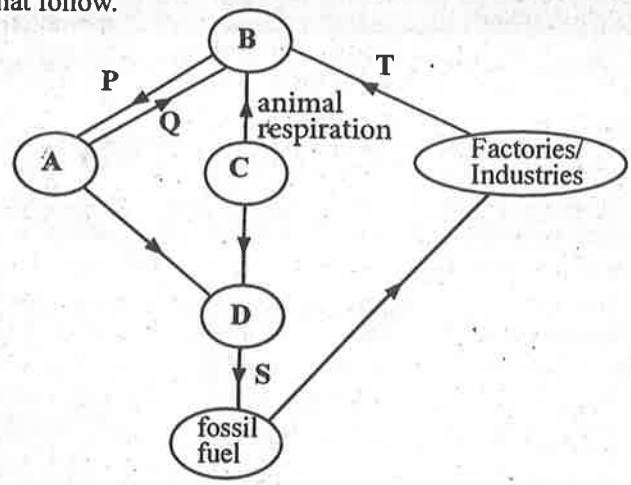


Figure **1**(*a*)

(i) Name **each** of the stages labelled **A**, **B**, **C** and **D**.

(ii) Name **each** of the processes labelled **P**, **S** and **T**.

(iii) State **three** activities of humans that could disrupt the cycle.

[10 marks]

(*b*) Figure **1**(*b*) is an illustration of two types of farming systems practised in Ghana labelled **K** and **L**. System **K** represents **four** farmlands labelled **A**, **B**, **C** and **D** and the arrows indicate movement of the farmer over a period of time as shown.

System **L** represents a farmland divided into **four** plots 1, 2, 3 and 4 and the arrows indicate the movement of the crops cultivated over the period.

Study the figure carefully and answer the questions that follow.

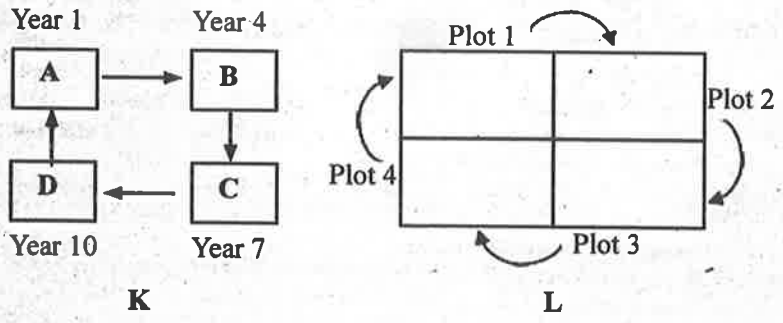


Figure **1**(*b*)

(i) Name **each** of the farming systems labelled **K** and **L**.

(ii) Give the reason for **each** of the names given in (i).

(iii) State **two** ways in which the farming system **K** is of importance to the farmer.

(iv) Give **three** reasons why the farming system **K** is **not** being encouraged in recent times.

(v) Name **one** type of crop that could be included in the farmland **L** to improve the fertility of the soil.

[10 marks]

(c) Figure 1(c) is an illustration of a mason pulling a slab by means of a rope up an inclined plane. The labels **I, II** and **III** represent forces acting on the slab.
Study the figure carefully and answer the questions that follow.

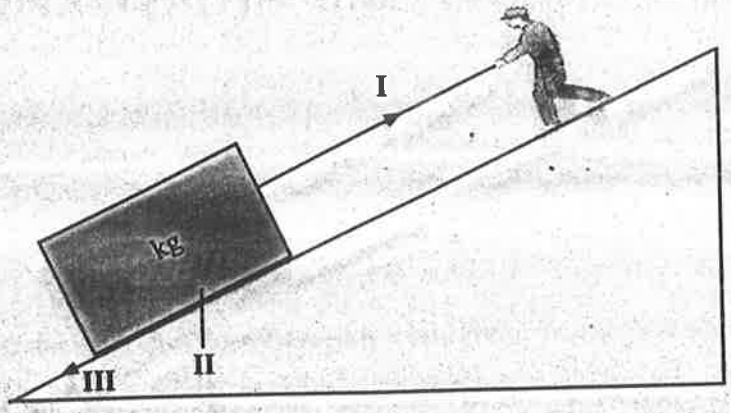


Figure 1(c)

(i) Give **three** examples of the use of inclined planes in everyday life.
(ii) Given that **I** is 400 N and moves a distance of 10 m whiles **II** is 100 N and moves a distance of 5 m, calculate the:
(α) work output;
(β) work input;
(γ) efficiency.

[10 marks]

(d) Figure 1(d) is an illustration of experimental set-ups **A** and **B** used to demonstrate a scientific principle. *Study the figure carefully and answer the questions that follow.*

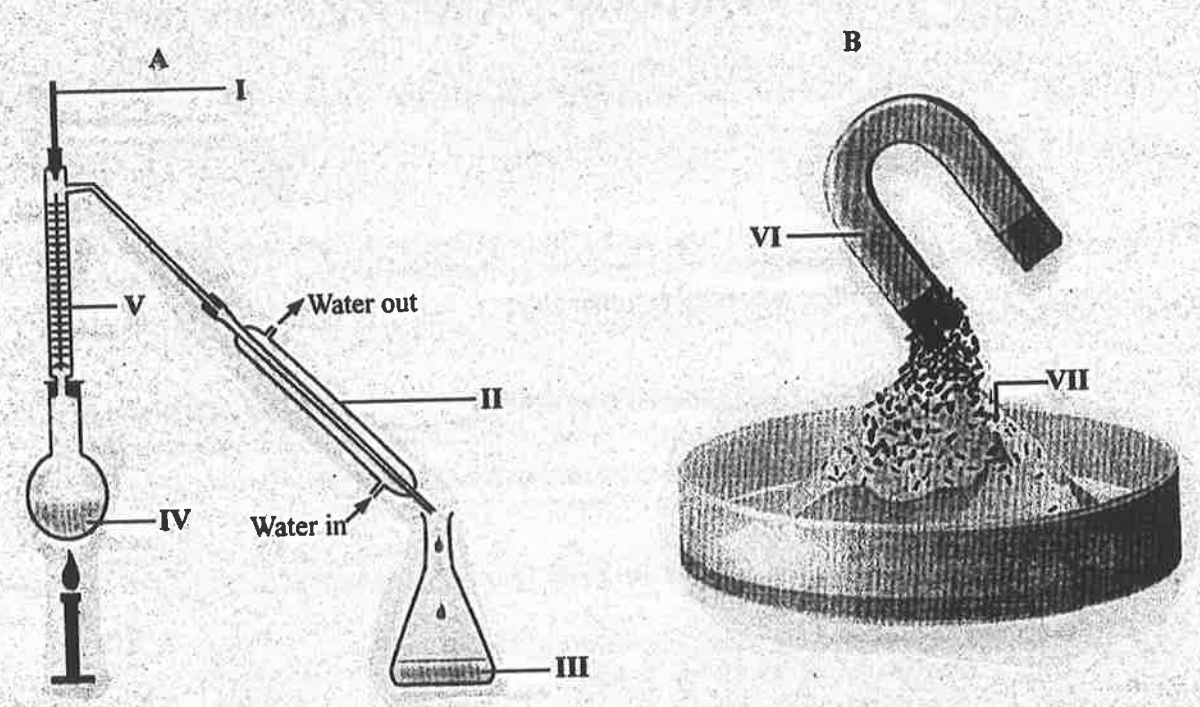


Figure 1(d)

(i) Name the scientific principle being demonstrated in **both A** and **B**.
(ii) Describe **briefly** the functions of **each** of the parts labelled **II** and **VI**.
(iii) Name any **two** types of materials that could be present in **each** of the set-ups labelled:
(α) **III**;
(β) **VII**.
(iv) Give the reason why the direction of water flow in **A** must **not** be reversed.

[10 marks]

SECTON B

[60 marks]

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

2. (*a*) (i) State **three** ways of conserving energy in the home.
(ii) An electrical appliance in the home uses 4000 W of electric power every 12 hours. Calculate the energy used within this time.

[7 marks]

(*b*) (i) Give **two** examples of an acid-base indicator.
(ii) State the colour change of **each** indicator given in (i) in an orange juice.

[4 marks]

(*c*) (i) State **four** activities that could be undertaken to ensure a green economy in Ghana.
(ii) Name **two** primary green-house gases associated with industrialization.

[6 marks]

(*d*) Describe **briefly** how compost could be prepared for a backyard garden. [3 marks]

3. (*a*) Name **two**:
(i) animal products used in preparing protein-rich feed for poultry;
(ii) plant products used in preparing carbohydrate-rich feed for poultry.

[4 marks]

(*b*) Describe **briefly** the water cycle. [6 marks]

(*c*) Consider the following mixtures:
Air, vinegar.
Air is essential to life.
Vinegar is a **common** household substance.
(i) Name the **two** major components of **each** mixture.
(ii) Which of the components named in (i) acts as the solvent in **each** of the mixtures?

[6 marks]

(d) (i) State **two** reasons why there is no life on the planet Jupiter.
(ii) List **two** other outer planets without life.

[4 marks]

4. (*a*) (i) Explain **briefly** why a kitchen knife is sharpened in order to cut a piece of yam easily.
(ii) A force of 10 N is exerted on a piece of yam using a knife of cross-sectional area 1×10^{-3} m^2. Determine the pressure exerted.

[6 marks]

(*b*) Outline the procedure used to estimate the pH value of a soil sample. [6 marks]

(*c*) A patient's blood pressure when measured read 150/90 mmHg.
(i) State the significance of the values.
(ii) State **three** remedies that could be recommended to the patient referred to in (*c*) other than medication.

[5 marks]

(*d*) State **three** characteristics of silage that has made its use desirable in recent times. [3 marks]

5. (*a*) Explain **briefly** how **each** of the following farming systems are practised:
   (i) organic farming;
   (ii) mixed farming;
   (iii) mixed cropping.
   [6 marks]

   (*b*) Classify a mixture of **each** of the following pairs of substances as either a homogeneous or heterogeneous mixture:
   (i) oil and water;
   (ii) salt and water;
   (iii) ethanol and water.
   [3 marks]

   (*c*) (i) Give **two** reasons why energy from the sun is said to be renewable.
   (ii) State **three** differences between *heat* and *temperature*.
   [5 marks]

   (*d*) Explain **briefly** two effects **each** of the following factors on the Nitrogen cycle:
   (i) leaching;
   (ii) removal of leguminous plants.
   [6 marks]

END OF ESSAY TEST

BLANK SHEET

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.

WHILE YOU ARE WAITING, READ THE FOLLOWING INSTRUCTIONS CAREFULLY

PAPER 1 45 minutes
OBJECTIVE TEST
[40 marks]

1. Use 2B pencil throughout.
2. On the pre-printed answer sheet, check that the following details are correctly printed:
   (*a*) In the space marked Name, check your **surname** followed by your **other names.**
   (*b*) In the spaces marked *Examination*, *Year*, *Subject* and *Paper*, check 'BECE','2025', 'SCIENCE', and '1' respectively.
   (*c*) In the box marked Index Number, your index number has been printed vertically in the spaces on the left-hand side, and **each** numbered space has been shaded in line with each digit. **Reshade** each of the shaded spaces.
   (*d*) In the box marked *Subject Code*, the digits 034012 are printed vertically in the spaces on the left-hand side. **Reshade** the corresponding numbered spaces as you did for your index number.
3. An example is given below. This is for a male candidate whose name is Daniel Nii DOTSEY. His *index number* is 7102143958 and he is offering *Science* 1.

THE WEST AFRICAN EXAMINATIONS COUNCIL
ANSWER SHEET

PRINT IN BLOCK LETTERS

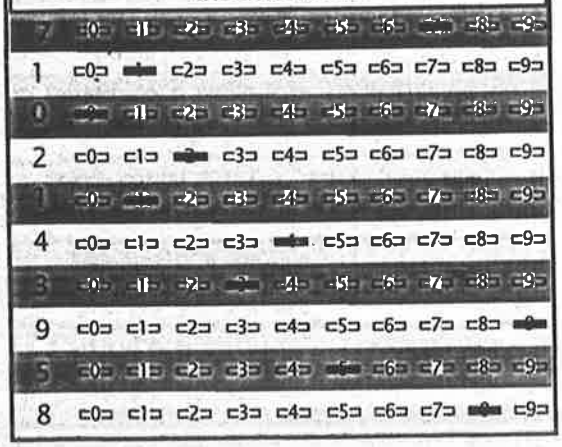
Name: DOTSEY DANIEL NII GHA

Examination: BECE Year: 2025

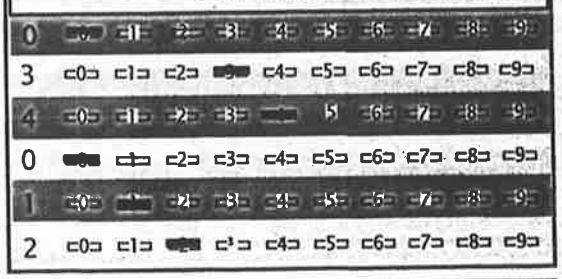
Subject: SCIENCE Paper: 1

INSTRUCTIONS TO CANDIDATES
1. Use grade 2B pencil throughout.
2. Answer each question by choosing one letter and shading like this: ⊏A⊐ ⊏B⊐ ⊏C⊐ ⊏D⊐
3. Erase completely any answer you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need.
5. Do not make any markings across the heavy black marks at the right hand edge of your answer sheet.

INDEX NUMBER



SUBJECT CODE



For Supervisors only

If candidate is absent shade this space ☐

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 answer 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 elements reacts with water?
A. Carbon
B. Sodium
C. Sulphur
D. Iodine

The correct answer is **Sodium** *which is lettered* **B** *and therefore answer space* **B** *would be shaded.*

⊏A⊐ ▬B▬ ⊏C⊐ ⊏D⊐

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

Do **all** *rough work in this question paper.*

Now answer the following questions.

1. The following factors hinder vegetable production in Ghana **except**?
   A. high cost of agricultural chemicals.
   B. lack of market for farm produce.
   C. irregular rainfall pattern.
   D. availability of sunlight.

2. The S.I unit of energy is represented as
   A. Joule.
   B. joule.
   C. j.
   D. Js.

3. A book is at rest on a table. The net force acting on the book could be described as one that
   A. is balanced.
   B. is unbalanced.
   C. is due to friction.
   D. obeys Newton's second law.

4. An example of a communicable disease is
   A. asthma.
   B. diabetes.
   C. hepatitis.
   D. hypertension.

5. To stop the spread of a disease caused by a dirty environment, one must
   A. eat healthy diet.
   B. ensure regular exercise.
   C. avoid alcohol.
   D. practice personal hygiene.

6. An animal feed made up of high fibre is **most** likely to contain
   A. maize grain.
   B. silage.
   C. soybean.
   D. wheat grain.

7. Charles Darwin is famous for
   A. discovering penicillin.
   B. his work on the origin of the universe.
   C. his work in the field of physics.
   D. his theory of natural selection.

8. Which of the following Ghanaian scientists is known for promoting Mathematics and Physics?
   A. Prof. Anamuah Mensah
   B. Prof. Ewurama Addy
   C. Prof. Francis Allotey
   D. Prof. Osei Anto

9. A mango of mass 2 kg hangs 15 m on top of a mango tree. Determine the value of the kinetic energy attained just before it hits the ground. [$g = 10\ m\ s^{-2}$]
   A. 30.0 J
   B. 225.0 J
   C. 300.0 J
   D. 3.0 J

10. An example of a mono-gastric animal is
    A. cattle.
    B. goat.
    C. sheep.
    D. rabbit.

11. Which of the following statements **accurately** explains the positions of calcium and magnesium in the periodic table? They all have the same
    A. proton number.
    B. valence electrons.
    C. number of shells.
    D. atomic structure.

12. Which of the following food substances would produce a red precipitate when heated with Millon's reagent?
    A. Banana
    B. Groundnut
    C. Orange juice
    D. Pineapple juice

13. The rise in heat waves and floods globally may be due to the effect of
    A. climate change.
    B. greenhouse gases.
    C. increased drought.
    D. severe storms.

14. Which of the following waste disposal practices is **best** for plastic disposal?
    A. Burning
    B. Composting
    C. Incineration
    D. Recycling

15. Which of the following organisms is prokaryotic?
    A. Bacteria
    B. Earthworm
    C. Fungus
    D. Plant

16. The first step in the digestion of fats in the body is that
    A. bile breaks down the fat in the gall bladder.
    B. bile breaks down the fat in the duodenum.
    C. lipase breaks down the fat in the pancreas.
    D. lipase breaks down the fat in the ileum.

17. Which of the following statements **best** explains animal feed?
    A. Food grown or developed for livestock
    B. Balanced diet provided to animals
    C. Breast milk served to a calf
    D. Grass that is used to feed livestock

18. Which of the following activities does **not** relate to the principles of pressure in the daily lives of humans?
    A. Drinking straw in use by the people at a party
    B. Pumping air into car tyres
    C. Filling of balloons with air
    D. A person jerking forward when a speeding car suddenly stops

19. A patient has been diagnosed of hypertension. Which of the following readings is **most** likely the patient's blood pressure?
    A. 110/85
    B. 120/80
    C. 130/85
    D. 140/90

20. Which of the following associations between **two** organisms is always beneficial to **both**?
    A. Commensalism
    B. Mutualism
    C. Saprophytism
    D. Symbiosis

21. Which of the following diseases can be classified as a viral disease?
    A. Candidiasis
    B. H1N1
    C. Meningitis
    D. Ringworm

22. Which of the following substances are major components of human blood?
I. Hormones
II. Platelets
III. Plasma
IV. White blood cells

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

23. Combination of science, technology and innovation is needed in Ghana because it
A. equips students to travel abroad and work.
B. makes students develop interest in science, technology and innovation.
C. makes students understand their environment better.
D. promotes national development.

24. A rod appears bent when immersed in water. Which property of light is demonstrated?
A. Refraction
B. Reflection
C. Dispersion
D. Rectilinear propagation

25. Which of the following heart conditions in humans is caused by *plaque deposits* in the arteries?
A. Atherosclerosis
B. Heart attack
C. Heart failure
D. Stroke

26. A grassland ecosystem that consists of snakes, toads and grasshoppers is most likely to produce a food chain of
A. toad → grass → grasshopper → snake.
B. grass → grasshopper → toad → snake.
C. grasshopper → grass → toad → snake.
D. grass → toad → grasshopper → snake.

27. A fruit with sour taste is most likely to have a pH that is
A. less than 7.
B. greater than 7.
C. equal to 14.
D. equal to 7.

28. Which of the following insect(s) show(s) the egg, nymph and adult stages in its life cycle?
I. Grasshopper
II. Housefly
III. Mosquito

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

29. The term used to describe a rabbit giving birth is
A. culling.
B. dubbing.
C. kindling.
D. weaning.

30. Which of the following statements **best** explains the term ecosystem? It is
A. a group of organisms of the same species that live in the same place at the same time.
B. a group of populations living in the same area at the same time.
C. the part of the earth's environment where life exists.
D. a community of living and non-living things interacting with each other.

31. Which of the following types of manure is **suitable** for a vegetable garden?
A. Cow dung
B. Dog faecal waste
C. Human excreta
D. Pig dung

32. A breeding female pig is called a
A. doe.
B. gilt.
C. heifer.
D. sow.

33. Which of the following energy sources is/are environmentally friendly?
I. Wind
II. Hydro
III. Biomass

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

34. Germs that infect the respiratory system are frequently spread through
I. mucus.
II. air pollution.
III. coughs.

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

35. The chemical formula of iron (II) sulphide is
A. FeS_2.
B. Fe_2S.
C. FeS.
D. Fe_2S_3.

36. The following soil qualities are important for crop production **except**
A. high salinity.
B. nutrient availability.
C. oxygen availability.
D. water-holding capacity.

37. The characteristics of a fertile soil include good
I. aeration,
II. texture,
III. water-holding capacity.

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

38. Which of the following substances has a definite shape?
A. Air
B. Kerosene
C. Stone
D. Water

39. Which of the following statements **best** explains why gases are **more** compressible than solids?
A. Particles in gases are smaller than in solids.
B. Gases have fixed volume but solids do not.
C. Particles in solids have definite shape but gases have no definite shape.
D. Particles in gases have wider intermolecular spaces as compared to solids.

40. An organism that lives on decaying organic matter, contaminates human food, feeds on rotten fruits and transfers germs is **most** likely a
A. fungus.
B. grasshopper.
C. housefly.
D. mosquito.

END OF PAPER