



- ❖ PAST QUESTIONS
- ❖ QUIZZES
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**THE WEST AFRICAN EXAMINATIONS COUNCIL**  
West African Senior School Certificate Examination  
for School Candidates

SC 2023

BIOLOGY 1  
OBJECTIVE TEST  
[50 marks]

50 minutes

*Do not open this booklet until you are told to do so. While you are waiting, write your **name** and **index number** in the spaces provided at the top right-hand corner of this booklet and thereafter, read the following instructions carefully.*

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 'WASSCE', 'SC 2023', 'BIOLOGY', and '1' in that order.
  - (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 504113 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 James Koku AMADU. His *index number* is 7102143958 and he is offering *Biology* 1.

**THE WEST AFRICAN EXAMINATIONS COUNCIL**  
**ANSWER SHEET**

PRINT IN BLOCK LETTERS			
Name: <b>AMADU JAMES KOKU</b>		<b>GHA</b>	
Examination: <b>WASSCE</b>		Year: <b>SC 2023</b>	
Subject: <b>BIOLOGY</b>		Paper: <b>1</b>	

**INSTRUCTIONS TO CANDIDATES**

1. Use grade 2B pencil throughout.
2. Answer each question by choosing one letter and shading it like this: **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐
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									
7	0	1	2	3	4	5	6	7	8
1	0	1	2	3	4	5	6	7	8
0	1	2	3	4	5	6	7	8	9
2	0	1	2	3	4	5	6	7	8
1	0	1	2	3	4	5	6	7	8
4	0	1	2	3	4	5	6	7	8
3	0	1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6	7	8
5	0	1	2	3	4	5	6	7	8
8	0	1	2	3	4	5	6	7	8

SUBJECT CODE									
5	0	1	2	3	4	5	6	7	8
0	1	2	3	4	5	6	7	8	9
4	0	1	2	3	4	5	6	7	8
1	0	1	2	3	4	5	6	7	8
1	0	1	2	3	4	5	6	7	8
3	0	1	2	3	4	5	6	7	8

**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 part of the gill of fish is involved in gaseous exchange? Gill

- A. slits
- B. bars
- C. covers
- D. filaments

The correct answer is filaments, which is lettered D and therefore answer space D would be shaded.

[ A ]

[ B ]

[ C ]

☒ D

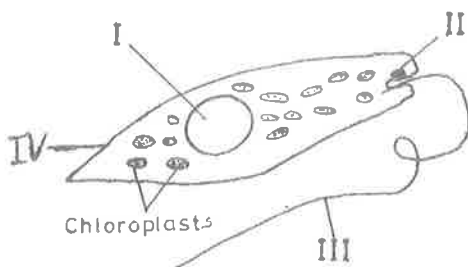
Think carefully before you shade the answer spaces; erase completely any answer(s) you wish to change.

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

Now answer the following questions.

1. Short sightedness is corrected with the use of
  - A. convex lens.
  - B. concave lens.
  - C. biconvex lens.
  - D. bifocal lens.

The diagram below is an illustration of an organism. Use it to answer questions 2 and 3.



2. The part that the organism uses for locomotion is labelled
  - A. I.
  - B. II.
  - C. III.
  - D. IV.

3. Glucose is stored in the organism as
  - A. starch.
  - B. sucrose.
  - C. cellulose.
  - D. chitin.
4. A student made a 6 cm drawing of an organism that has an actual length of 12 cm. What is the magnification of the drawing?
  - A.  $\times 0.5$
  - B.  $\times 2$
  - C.  $\times 36$
  - D.  $\times 72$
5. A difference between mosses and ferns is that
  - A. the sporophytes of mosses are dependent on their gametophytes.
  - B. the sporophytes of mosses are not dependent on their gametophytes.
  - C. mosses produce spores but ferns do not.
  - D. mosses are bigger than ferns in size.

6. Different processes taking place at the same time in higher organisms is because they have
- a high rate of metabolism.
  - an efficient coordination system.
  - numerous mitochondria to provide energy.
  - few interconnected cells.

7. The organism that is **not** single-celled and free-living is
- Volvox*.
  - Amoeba*.
  - Euglena*.
  - Paramecium*.

8. Which of the following organelles has a single bounding membrane?
- Chloroplast
  - Mitochondrion
  - Nucleus
  - Vacuole

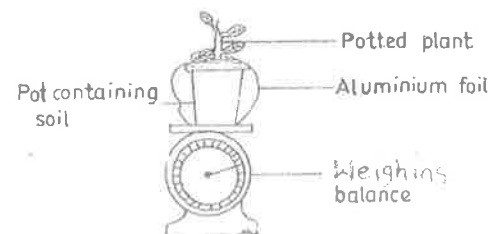
9. The **two most** important bio-physical processes involved in the absorption and transport of materials in plants are
- osmosis and diffusion.
  - diffusion and plasmolysis.
  - plasmolysis and capillarity.
  - cohesion and turgidity.

10. The role of a clinostat during a tropic growth experiment is
- it enables auxins to accumulate at definite locations.
  - it stimulates the production of auxins by the seedling.
  - it enables auxins to combine with other hormones.
  - its rotation prevents auxins from accumulating at a spot.

11. Support in young herbaceous plants is provided by
- translocation.
  - osmosis.
  - turgidity.
  - flaccidity.

The diagram below is an illustration of an experiment to measure the rate of a biological process in flowering plants.

Study it and answer questions 12 and 13.

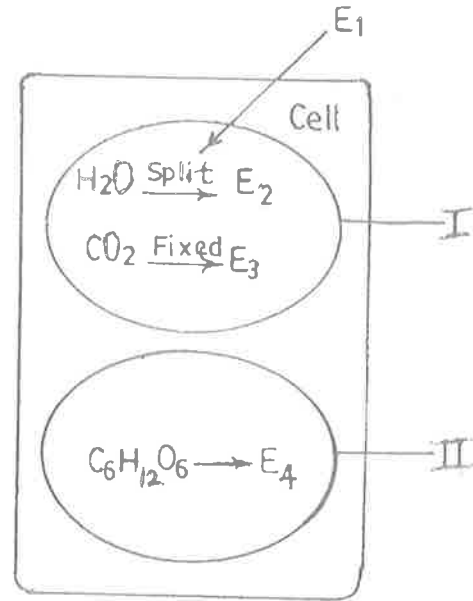


12. The aim of the experiment is to measure the rate of
- respiration in the potted plant.
  - photosynthesis in the potted plant.
  - transpiration in the potted plant.
  - translocation in the potted plant.
13. The function of aluminium foil in the experiment is to prevent
- evaporation of water from the soil.
  - direct rays of sunlight from entering the soil.
  - diffusion of oxygen from the living organisms in the soil.
  - excessive water from entering the soil.
14. During inspiration, oxygen diffuses into the capillaries around the alveoli because
- oxygen concentration in the blood is lower than that of the air in the alveoli.
  - oxygen concentration in the blood is higher than that of the air in the alveoli.
  - carbon dioxide concentration in the blood is lower than that of the air in the alveoli.
  - the pressure around the alveoli in the thoracic cavity decreases.

**Turn over**

15. Glomerular filtrate normally contains
- glucose.
  - platelets.
  - tears.
  - fibrinogen.
16. Ultrafiltration process at the Bowman's capsule is facilitated by
- a high blood pressure in the glomerulus.
  - the volume of water in the blood.
  - reabsorption of urea, water and glucose in the Bowman's capsule.
  - the differential blood volume between glomerulus and the Bowman's capsule.
17. The hormone in plants that controls tropic movement is
- ethylene.
  - gibberellin.
  - cytokinin.
  - auxin.
18. Which of the following substances is contained in the central canal of the spinal cord?
- White matter
  - Cerebrospinal fluid
  - Grey matter
  - Lymph
19. The urethra in mammalian males is urinogenital because it allows the passage of
- urine and semen.
  - urine and water.
  - blood and semen.
  - ovum and urine.
20. A fruit formed from a compound ovary which splits into several parts is a
- follicle.
  - legume.
  - capsule.
  - cypsela.

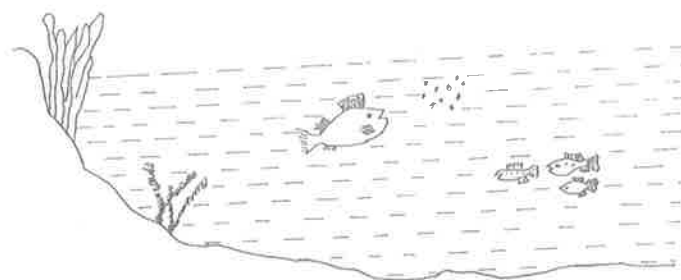
The diagram below illustrates energy transformations occurring inside **two** organelles **I** and **II** in a plant cell. The forms of energy are represented as **E1**, **E2**, **E3** and **E4**. Study them and answer questions **21** and **22**.



21. What form of energy is represented by **E1**?
- Radiant energy in the form of photons
  - Chemical energy stored in the bonds of glucose molecule
  - Mechanical energy in the form of *ATP*
  - Chemical energy released by glycolysis
22. If the transformation in organelle **II** requires oxygen, what form of energy is represented by **E4**?
- Radiant energy in the form of photons
  - Mechanical energy stored in the bonds of glucose molecule
  - Chemical energy in the form of *ATP*
  - Chemical energy released by glycolysis
23. In a mitochondrion, pyruvic acid is converted to
- acetyl co-enzyme A.
  - citric acid.
  - oxalo-acetic acid.
  - succinic acid.

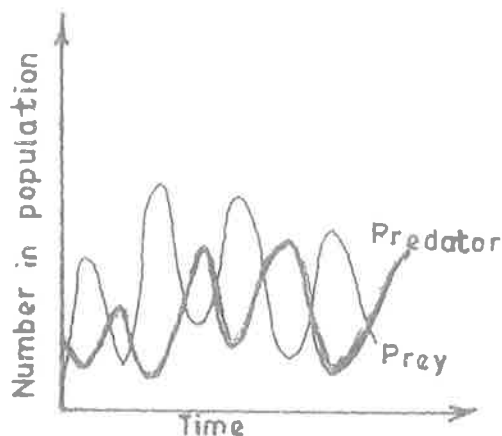
24. Green plants synthesize their foods through a process known as
- gocotropism.
  - chemosynthesis.
  - heterotrophism.
  - photosynthesis.
25. Boiling a leaf in water when testing for the presence of starch in the leaf is to
- remove green colour of the leaf.
  - kill the protoplasm.
  - moisten the leaf.
  - observe the colour change clearly.
26. Carnassial teeth in animals are the
- premolars and molars.
  - canines in herbivores.
  - last upper premolar and first lower molar.
  - first premolar and last molar.
27. The average frequency of *Andropogon* grass in a lawn is 70. If one hundred tosses were made with a  $1\text{ m}^2$  quadrat, what would be the population density of *Andropogon* in the field?
- 60 per  $\text{m}^2$
  - 70 per  $\text{m}^2$
  - 80 per  $\text{m}^2$
  - 90 per  $\text{m}^2$
28. Communities are named after
- abiotic components.
  - dominant species.
  - pioneer species.
  - edaphic compositions.

29. The diagram below is an illustration of organisms in a pond. The abiotic factor that is **not** likely to affect the organisms is



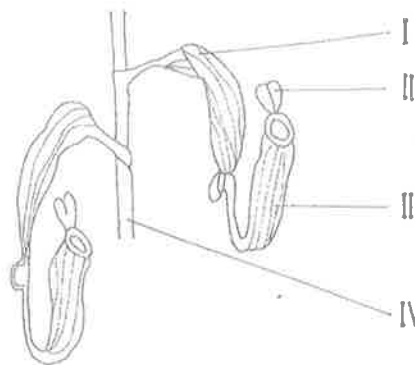
- humidity.
  - turbidity.
  - temperature.
  - rainfall.
30. Hygrometer is used for measuring
- light intensity.
  - turbidity.
  - relative humidity.
  - salinity.
31. Which of the following organisms occupies the first level of a food chain?
- A plant capable of photosynthesizing
  - An animal carrying out holozoic nutrition
  - A saprophytic fungus
  - A carnivore

The graphs below are illustrations of varying populations of predator and prey in a habitat. Study them and answer questions 32 and 33.



32. A deduction from the graphs is that
- predators and preys do not exist normally in a community.
  - the population of preys was highest when the population of predators was lowest.
  - an increase in the population of predators will increase the population of preys.
  - a decrease in the population of predators will cause a decrease in the population of preys.
33. If there was a rapid increase in the population of predators, the population of
- preys would be lowest and may diminish.
  - preys would increase for a balanced community.
  - predators would still continue to increase.
  - preys would be unchanged.

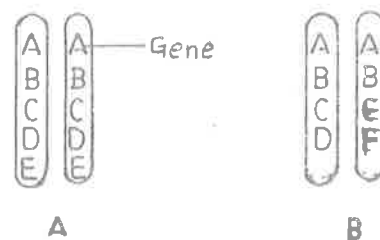
The diagram below is an illustration of a plant with its modified leaves. Study it and answer questions 34 to 36.



34. The plant illustrated is
- Butterwort.
  - Pitcher plant.
  - Sundew.
  - Venus flytrap.
35. Which of the labelled parts adapt the plant to its heterotrophic mode of feeding?
- I and II
  - II and III
  - I and IV
  - II and IV
36. The product of digestion is stored in the part labelled
- I.
  - II.
  - III.
  - IV.
37. An activity of humans that endangers animals is
- domesticating animals.
  - destruction of habitats.
  - competition.
  - parasitism.

38. An example of fossil fuel is
- limestone.
  - water.
  - coal.
  - firewood.
39. Conservation of natural resources would **not** be achieved by
- controlling farming practices.
  - establishing forest reserves.
  - protecting endangered species.
  - encouraging poaching in game reserves.
40. The factors that **must** be considered for safe blood transfusion in humans are
- weight and genotype.
  - sex-linked characters and age.
  - age and infectious disease screening.
  - infectious disease screening and blood group.
41. Which of the following variations in populations have intermediate forms?
- Eye colour
  - Tongue rolling
  - Ability to taste PTC
  - Shape of earlobes
42. Which of the following parental genotypes would produce offspring of the **four** blood groups?
- OO** and **BO**
  - AO** and **BO**
  - AB** and **OO**
  - AO** and **OO**

Diagrams **A** and **B** are illustrations of homologous pairs of chromosomes drawn by students **A** and **B**, respectively. Use them to answer questions **43** to **45**.



43. Which of the following statements is **correct**?
- The drawing by student **B** is the homologous pair of chromosomes
  - The drawing by student **A** is the homologous pair of chromosomes
  - One chromatid in the drawing by student **A** is a homologous chromosome
  - One chromatid in the drawing by student **B** is a homologous chromosome
44. The pair of chromosomes in **A** could be obtained from
- the offspring.
  - same parent.
  - mitotic division.
  - different parents.
45. The total number of genes in the chromosome in diagram **A** is
- 1
  - 2
  - 5
  - 8

A sex-linked gene **a** that causes a specific disease was found in a small population of humans. The genotypes found were:

- I     $X^A$      $X^A$
- II    $X^A$     Y
- III  $X^a$      $X^a$
- IV  $X^a$     Y

Use the information to answer questions 46 and 47.

46. Which of the following individuals in the population would **not** be affected by the disease?
- A. I and II
  - B. I and III
  - C. II and III
  - D. I and IV
47. Which of the individuals in the population would be a male that is affected by the disease?
- A. I
  - B. II
  - C. III
  - D. IV
48. The evidence for evolution **cannot** be obtained from
- A. embryology.
  - B. homeostasis.
  - C. anatomy.
  - D. fossil.

49. The cost of mechanised farming would be increased by the activities of
- A. grasshoppers.
  - B. honeybees.
  - C. mosquitoes.
  - D. termites.
50. Individuals that possess variations that give them an advantage in obtaining limited resources would **likely**
- A. be preserved as fossils.
  - B. survive and reproduce.
  - C. go into extinction.
  - D. diverge markedly.

**END OF PAPER**