

SC5041  
WASSCE 2021  
BIOLOGY 1  
Objective  
50 minutes

1

Name.....

Index Number.....

THE WEST AFRICAN EXAMINATIONS COUNCIL  
West African Senior School Certificate Examination  
for School Candidates

SC 2021

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.

- Use 2B pencil throughout.
- On the pre-printed answer sheet, check that the following details are correctly printed:
  - In the space marked *Name*, check your surname followed by your other names.
  - In the spaces marked *Examination*, *Year*, *Subject* and *Paper*, check 'WASSCE', 'SC 2021', 'BIOLOGY', and '1' in that order.
  - 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.
  - 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.
- An example is given below. This is for a male candidate whose name is Adams Smith ACKAH. His index number is 7102143958 and he is offering *Biology 1*.

THE WEST AFRICAN EXAMINATIONS COUNCIL  
ANSWER SHEET

PRINT IN BLOCK LETTERS		GHA	
Name:	ACKAH ADAMS SMITH	Year:	SC 2021
Examination:	WASSCE	Paper:	1
Subject:	BIOLOGY		

INSTRUCTIONS TO CANDIDATES

- Use grade 2B pencil throughout.
- Answer each question by choosing one letter and shading it like this:  A  B  C  D  E
- Erase completely any answer you wish to change.
- Leave extra spaces blank if the answer spaces provided are more than you need.
- 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	9
1	0	1	2	3	4	5	6	7	8	9
2	0	1	2	3	4	5	6	7	8	9
3	0	1	2	3	4	5	6	7	8	9
4	0	1	2	3	4	5	6	7	8	9
5	0	1	2	3	4	5	6	7	8	9
6	0	1	2	3	4	5	6	7	8	9
7	0	1	2	3	4	5	6	7	8	9
8	0	1	2	3	4	5	6	7	8	9

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

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?

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

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

[A]      [B]      [C]       [D]

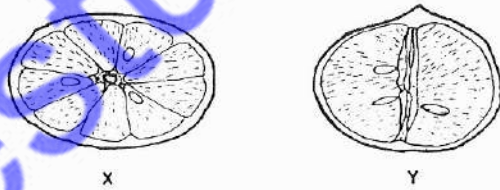
Think carefully before you shade the answer spaces; erase completely any answer(s) you wish to change.

Do all rough work on this question paper.

Now answer the following questions.

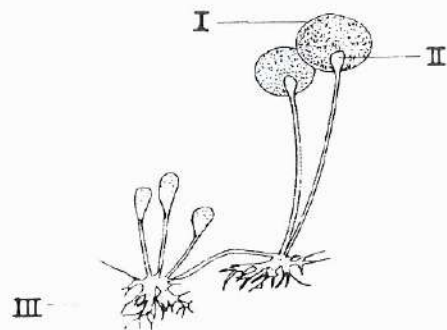
1. Which of the following organelles is common to both plant and animal cells?
- A. Large vacuole
  - B. Cell membrane
  - C. Chlorophyll
  - D. Cellulose cell wall
3. The fruit that has the illustrated sections is a
- A. hesperidium.
  - B. capsule.
  - C. drupe.
  - D. cypsela.

The diagrams below are illustrations of different sections of a particular fruit. Study them and answer questions 2 and 3.



2. The sections in X and Y respectively, are
- A. longitudinal and transverse.
  - B. transverse and longitudinal.
  - C. cross and transverse.
  - D. transverse and cross.

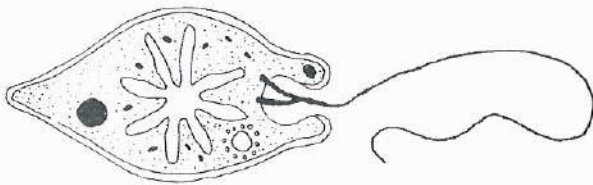
The diagram below is an illustration of a fungus. Study it and answer questions 4 to 6.



4. The structure labelled I is associated with
- A. gamete formation.
  - B. bud formation.
  - C. asexual reproduction.
  - D. sexual reproduction.

5. The structure labelled **II** is the
- sporangium.
  - columella.
  - stolon.
  - spore.
6. Which of the following statements about the structure labelled **III** is **correct**? It
- develops into stolon
  - forms the root hairs of the organism
  - absorbs mineral salts from the soil
  - secretes digestive enzymes into the substrate

The diagram below is an illustration of a living organism. Study it and answer questions 7 and 8.

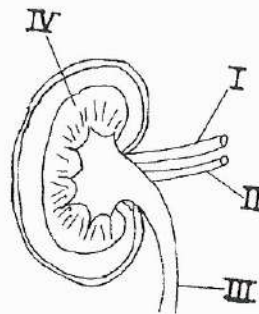


7. The level of organization of the organism is
- system.
  - organ.
  - cell.
  - tissue.
8. The organism belongs to the Phylum
- Rhodophyta.
  - Euglenophyta.
  - Ciliophora.
  - Rhizopoda.
9. A plant cell placed in a solution with a higher water potential will
- decrease in size and become flaccid.
  - expand and then burst.
  - enlarge and become turgid.
  - expand and then shrink.

ggghhh

10. Offspring formed by sexual reproduction exhibit more variation than those formed by asexual reproduction because
- sexual reproduction is a lengthy process.
  - genetic materials come from parents of two different species.
  - gametes of parents have different genetic composition.
  - greater amount of *DNA* is involved in sexual reproduction.
11. *Radius and ulna* are bones of the
- lower arm.
  - pelvic girdle.
  - upper arm.
  - pectoral girdle.
12. The blood vessel which carries blood from the alimentary canal to the liver is the
- mesenteric artery.
  - hepatic portal vein.
  - hepatic vein.
  - hepatic artery.

The diagram below is an illustration of the longitudinal section of a mammalian organ. Study it and answer questions 13 and 14.



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13. Which of the labelled parts is the cortex?
- IV
  - III
  - II
  - I

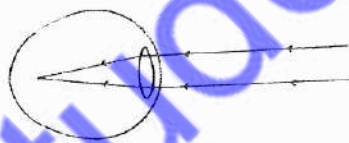
14. What is the **main** function of the organ?
- Locomotion
  - Reproduction
  - Respiration
  - Excretion

15. *Detoxification* of urea takes place in the
- testes.
  - liver.
  - heart.
  - pancreas.

16. Which of the following hormones is suddenly secreted into the bloodstream of a frightened person?
- Parathormone
  - Thyroxine
  - Adrenaline
  - Insulin

17. The temperature control centre in mammals is located in the
- adrenal gland.
  - pituitary gland.
  - hypothalamus.
  - skin.

The diagram below is an illustration of a type of eye defect in humans. *Study it and answer questions 18 and 19.*



18. The eye defect illustrated in the diagram is
- myopia.
  - presbyopia.
  - astigmatism.
  - hypermetropia.
19. The eye defect can be corrected by the use of
- cylindrical lens.
  - bifocal lens.
  - concave lens.
  - convex lens.

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20. How many gametes are produced in the pollen grain of a flowering plant before fertilization?

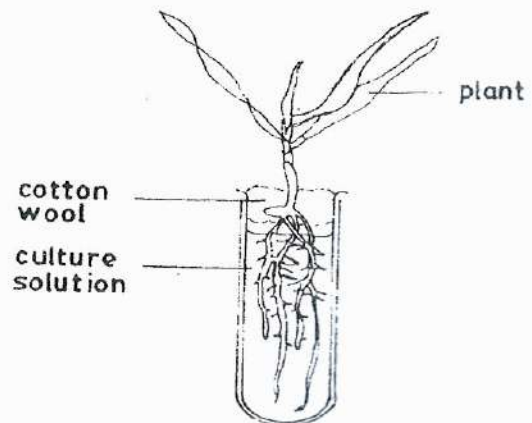
- Four
- Three
- Two
- One

21. Which of the following organisms does **not** undergo incomplete metamorphosis?

- Cockroach
- Butterfly
- Grasshopper
- Locust

22. An enzyme reaction may begin to decline when
- the atmospheric pressure is altered.
  - there is an increase in substrate concentration.
  - the pH of the medium is altered.
  - the optimum temperature is attained.

The diagram below is an illustration of the growth of a plant in a water culture. After a few days, the solution turned green and the plant died. *Use it to answer questions 23 and 24.*



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23. What precaution should have been taken to prevent the solution from turning green?
- Keep cotton wool around the seedling to make it dry
  - Cover the culture vessel with opaque paper
  - Aerate the solution daily
  - Use a non-green plant for the experiment

24. The death of the plant was **likely** caused by
- inability of the plant to make food due to lack of sunlight.
  - algal growth in the solution that used up the nutrients.
  - inadequate supply of water to the plant.
  - excess supply of nutrients to the plant.

25. Which of the following factors is **not** necessary for photosynthesis?
- Sunlight
  - Wind
  - Carbon (IV) oxide
  - Water

26. *Autotrophic nutrition* is a process whereby an organism obtains food
- in a synthesized form, from other living organisms.
  - from other organisms in exchange for some products.
  - by synthesizing simple substances using energy.
  - by utilizing its stored energy.

27. The process that takes place at the light stage of photosynthesis is
- breaking down of *ATP* molecules to produce energy.
  - formation of two molecules of phosphoglyceric acid.
  - reduction of carbon (IV) oxide to form carbohydrate.
  - splitting of water molecules to form hydrogen ions.

28. The diagram below is an illustration of the foot of an animal.



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- The adaptation of this type of foot is that it is
- used for killing prey in water.
  - effective in scratching the soil for food.
  - used as a paddle for swimming.
  - used as a bait to catch fish in water.

29. The following organisms are examples of carnivorous plants **except**

- Utricularia*
- Pitcher plant
- Venus flytrap
- Gloriosa*

30. Plants and animals of an ecosystem make up a
- population.
  - community.
  - succession.
  - habitat.

31. Rabbits **cannot** survive in an aquatic habitat because they have
- lateral line.
  - fore limbs.
  - no gills.
  - no scales.

32. The illustration below is a food chain.

Grass → grasshopper → domestic fowl → hawk

What would happen if the population of domestic fowl decreases? The population of

- grasses available to grasshoppers would increase
- grasshoppers would increase
- hawks would increase
- grasshoppers would decrease

33. Which of the following features is a characteristic of aquatic plants? Possession of

- succulent stem
- finely divided leaves
- heavily lignified tissue
- multiple epidermis

Turn over

34. An association between living organisms in which one organism lives on and feeds at the expense of the other organism is known as
- predation.
  - parasitism.
  - commensalism.
  - mutualism.

35. When a large number of organisms share limited resources, the result is
- competition.
  - commensalism.
  - extinction.
  - mutualism.

36. Which of the following behaviours is **correctly** matched with the corresponding diseases?

	Behaviour	Diseases
A.	Smoking cigarette	liver cirrhosis, lung cancer, AIDS.
B.	Having multiple sexual partners	liver cirrhosis, syphilis, AIDS.
C.	Living near dirty gutter	lung cancer, syphilis, river blindness.
D.	Eating uncooked meat	dysentery, cholera, food poisoning.

37. Endangered species are organisms that are
- dangerous to humans and attacking other animals.
  - reproducing profusely in an area.
  - likely to disappear from the surface of the earth.
  - likely to migrate to other favourable lands.

38. Which of the following practices is a wildlife conservation method?

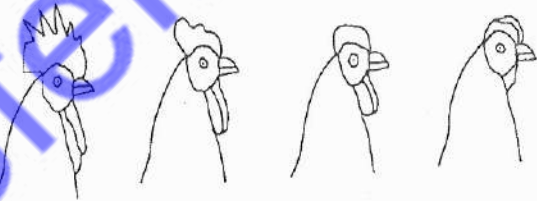
- Discouraging poaching
- Mulching
- Crop rotation
- Use of cover crops

39. Which of the following resources **cannot** be conserved?

- Garbage
- Soil
- Water
- Forest

The diagrams below are illustrations of types of comb found in domestic fowl.

Study them and answer questions 40 and 41.



40. The types of comb show

- courtship behaviour.
- cell theory.
- inheritance.
- variation.

41. Which factor is **most likely** responsible for the various types of comb?

- Morphology
- Physiology
- Genetics
- Environment

42. Which of the following statements about mitosis is **not** correct?
- Four daughter cells are produced
  - It does not lead to variation
  - Bi-valents are not formed
  - Chiasmata are not formed
43. A mixture of blood with antigen A and blood containing antibody a will
- change the blood group.
  - have no effect on blood composition.
  - facilitate dissolution of clot.
  - lead to agglutination.
44. Plants suitable for experiments in genetics must **not**
- produce one generation in a long period.
  - have a relatively short life cycle.
  - have a small number of chromosomes.
  - produce numerous seeds within a short time.
45. Which of the following statements about sickle cell anaemia is **correct**?
- It is caused by recessive genes
  - Two sickle cell carrier parents may have a sickling child
  - It is more common in males than in females
  - It is caused by sex-linked genes
46. In humans, pointed eyebrows (**B**) is a dominant trait over smooth eyebrows (**b**). A student and the mother have smooth eyebrows while the father has pointed eyebrows. What is the genotype of the father?
- BBbb**
  - bb**
  - Bb**
  - BB**
47. A woman with Rhesus negative blood group was advised **not** to marry a man with Rhesus positive blood group because
- it may affect her childbearing ability.
  - her children may all resemble her husband.
  - it will result in sickness and probably death of the offspring.
  - it will hinder her from having blood transfusion from her husband.
48. Which of the following organisms exhibits division of labour?
- Housefly
  - Termite
  - Cockroach
  - Butterfly
49. Natural selection arises as a result of
- climate change.
  - reduction in population.
  - change of habitat.
  - gene mutation.
50. Which of the following statements is **not** Lamarck's postulate on evolution?
- Survivors in a competitive community must have inherited useful traits
  - Well developed acquired characters are inheritable
  - Frequently used organs become well developed while the ones not used become vestigial
  - Great changes in the environment result in corresponding changes in species

**END OF PAPER**