



*Dr. Bbosa Science*

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NAME:..... STREAM.....

**SENIOR FOUR**

553/1

**BIOLOGY**

**PAPER 1**

**EXAM 8**

**2 hour 30 Minutes**

**Instructions to candidates**

Answer all questions in section A and B, plus two questions in section C.

Write the answers to section A on the answer sheet provided at the end of that section, answers to section B in the spaces provided, and answers to section C in the answer booklets provided.

**FOR EXAMINERS USE ONLY**

<b>Section</b>	<b>Marks</b>
<b>A</b>	
<b>B: No 31</b>	
No 32	
No 33	
<b>C: No</b>	
No	
<b>Total</b>	

**TURN OVER**

**SECTION.A (30 MARKS)**

**Answer all questions in the section. Write the answer (Letter) representing the most correct answer to each question on the answer sheet provided at the end of the section.**

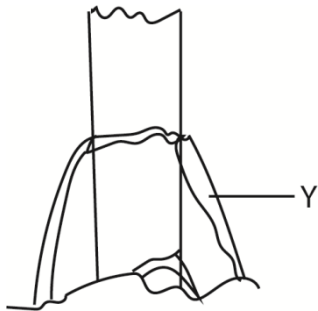
1. Which one of the following sets of events occurs in a person when feeling cold?

- A. Blood capillaries constrict, hair rises and metabolic rate increases
- B. Hair lowers, blood capillaries dilate and metabolic rate decreases.
- C. Metabolic rate increases, blood capillaries dilate and hair lowers.
- D. Metabolic rate decreases, blood capillaries construct and hair rises

2. Which one of the following word equations summarizes the process of formation?

- A. Glucose  $\longrightarrow$  ethanol + carbon dioxide + water
- B. Glucose  $\longrightarrow$  lactic acid + energy + water
- C. Glucose  $\longrightarrow$  ethanol + carbondioxide + energy
- D. Glucose  $\longrightarrow$  lactic acid + water + carbondioxide

3. The type of roots labeled Y in figure below are called



- A. prop roots
- B. lateral roots
- C. clasping roots
- D. adventitious roots

4. What are the chances of parents who are carriers of a gene for albinism producing an albino child?

- A. 25%
- B. 50%
- C. 75%
- D. 100%

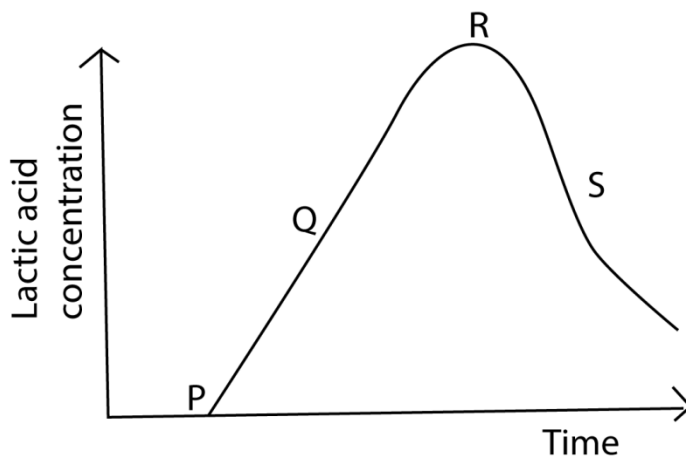
5. Which one of the following is the mode of feeding of a mould.

- A. Holozoic
- B. saprophytic
- C. autotrophic
- D. Parasitic

6. Which one of the following is a characteristics of Sunday soils?

- A. high retention
- B. high capillarity
- C. low drainage
- D. high porosity

7. Which one of the following plant organs has a scattered arrangement of vascular bundles?
- root of a monocotyledonous plant
  - stem of a monocotyledonous plant
  - stem of a dicotyledonous plant
  - root of a dicotyledonous plant
8. In the colonization of a bare rock, the next most likely group of plants after the lichens are the
- grasses
  - mosses
  - Shrubs
  - trees
9. Which one of the following includes all the possible blood groups that can be possessed by the children from a marriage between a mother heterozygous for blood group A and a father heterozygous for blood group B?
- A and B
  - AB and O
  - A, B and O
  - A, B, AB and O
10. Which one of the following is a correct route taken by carbondioxide from the body cells of an insect to the atmosphere
- Trachea → Tracheoles → Spiracles
  - Spiracles → Trachea → Tracheoles
  - Tracheoles → Trachea → Spiracles
  - Spiracles → Tracheoles → Trachea
11. In an experiment to find the proportion of air in soil, the following results were obtained.
- |  |                    |
|--|--------------------|
| Volume of soil                           | = $X\text{cm}^3$   |
| Volume of water added to soil            | = $200\text{cm}^3$ |
| Volume of soil plus water after stirring | = $Y\text{cm}^3$   |
- Which one of the following expressions gives the volume of air in the soil samples
- $Y - X\text{ cm}$
  - $(X + 200) - Y\text{cm}^3$
  - $(Y - 200)\text{cm}^3$
  - $Y - (X + 200)\text{cm}^3$
12. Which one of the following enzymes acts best at low PH?
- Pepsin
  - Peptides
  - Trypsin
  - Lipase
13. The figure below shows the concentration of lactic acid in blood of an athlete during and after a race. During which period on the graph does the athlete not experience both aerobic and anaerobic respiration?



- A. P – Q
- B. Q – R
- C. R – S
- D. P – R

14. Which of the following are characteristics of insect pollinated flowers?

- A. feathery stigmas, light pollen grains
- B. sticky stigmas, light pollen grains
- C. light pollen grains, dull coloured
- D. long filaments, much pollen

15. The part of the microscope used to make the image clear is the

- A. objective lens
- B. eye piece
- C. coarse adjustment
- D. fine adjustment

16. Which one of the following correctly describes population density?

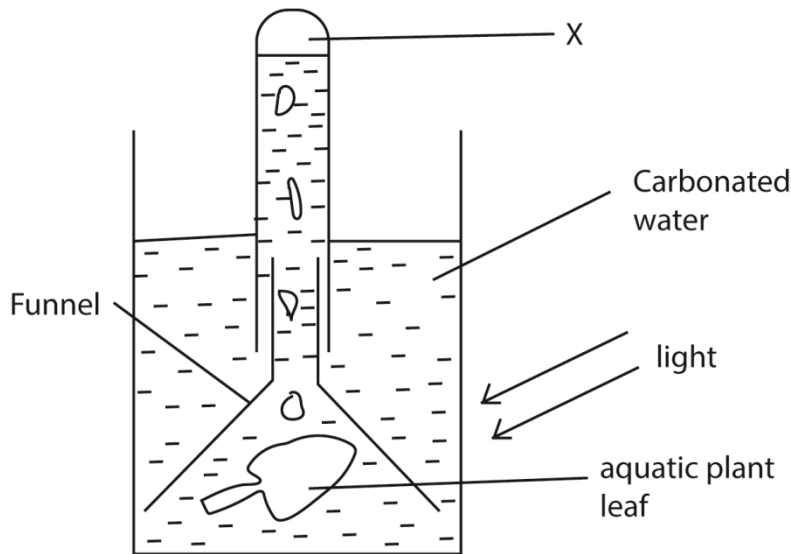
The number of organism

- A. In a specified area
- B. Of a particular species in a specified area
- C. Living either on land or water
- D. Which can interbreed and produce viable offspring

17. Which one of the following is a form of sexual reproduction?

- A. binary fission
- B. fragmentation
- C. conjugation
- D. spore formation

18. Figure below is an experimental set up to demonstrate photosynthesis



Gas X produced in the experiment is tested by use of

- A. Glowing splint
- B. lime water
- C. litmus paper
- D. sodium bi bicarbonate

19. The main function of buttress roots is to

- A. provide additional support
- B. store food for the plant
- C. enable the plant clasp firmly onto others
- D. store water for the plant

20. The bacteria which convert ammonia into nitrates are called

- A. purifying bacteria
- B. nitrifying bacteria
- C. denitrifying bacteria
- D. nitrogen fixing bacteria

21. Which one of the following is likely to occur if the osmotic pressure of the cell sap of the root hair is lower than that of the surrounding?

- A. plant wilts
- B. cells of root hairs become turgid
- C. rate of transpiration increases
- D. more water is absorbed

22. Which one of the following features of arthropods would be least important when constructing an identification key?

- A. presence or absence of antennae
- B. Number of body divisions
- C. Number of jointed appendages
- D. Body colour

23. The following is the reason for classifying a house fly as an insect.

- A. has a pair of wings

- B. Jointed body parts
- C. three pairs of legs
- D. two main body parts

24. Which one of the following conditions would lead to the highest transpiration rate?

- A. high light intensity and low temperatures
- B. low light intensity and high temperatures
- C. Low humidity and high temperatures
- D. High humidity and low temperatures

25. Which one of the following parts of the kidney carries out the excretory function.

- A. cortex
- B. pelvis
- C. Medulla
- D. nephron

26. Which of the following events result into the formation of identical twins?

- A. One egg released, fertilized and splits into two
- B. Two eggs released and each fertilized by a separate sperm
- C. One egg is released and fertilized by two sperms
- D. One egg released, splits and fertilized by separate sperms

27. Which one of the following diseases is not prevented by washing of hands and covering of food?

- A. cholera
- B. typhoid
- C. tape worm infection
- D. dysentery

28. Which one of the following responses in plants is dependant on the intensity of a stimulus and not the direction?

- A. Nastic response
- B. geotropism
- C. hydrotropism
- D. phototropism

29. Which of the following soil types has the highest water holding capacity?

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

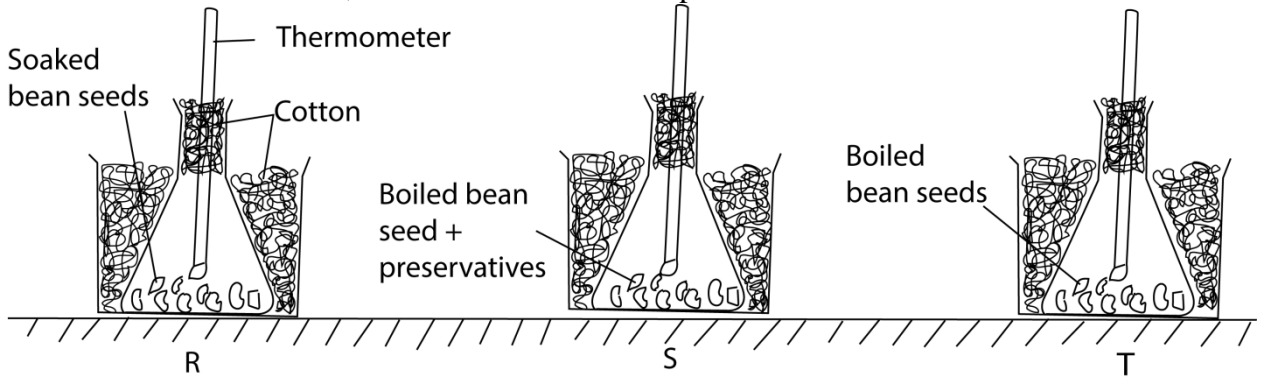
30. The following are types of plant hormones except

- A. Gibberellins
- B. adrenalin
- C. cytokinins
- D. ethene

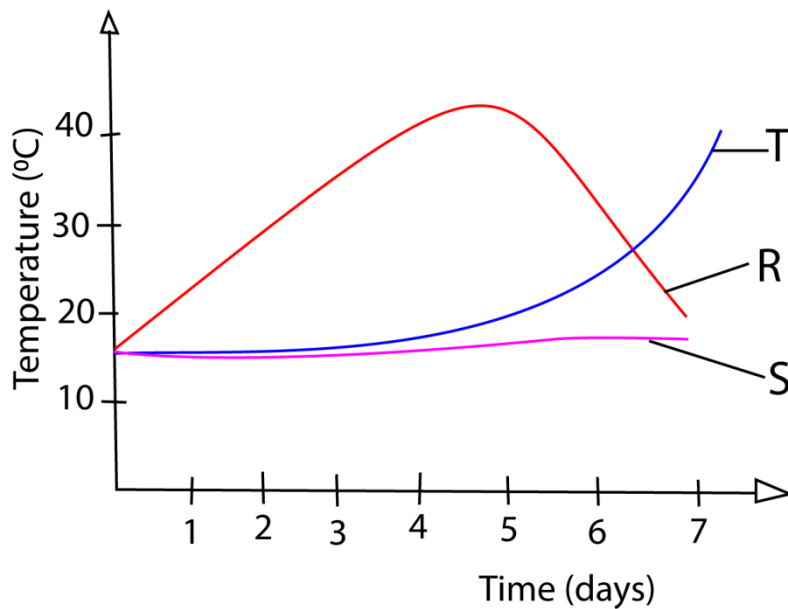
**SECTION. B (40 MARKS)**

**Answer all questions in this section, answer must be written in the spaces provided.**

31. A student carried out an experiment using the set of apparatus below. In R, beans seed soaked in water were used. In S, boiled bean seeds sprinkled with a preservative were used while in T; boiled seeds without the preservative were used.



The temperature in each was recorded for a week. The results obtained are shown in the graph below



a) State the aim of the experiment.

(02 marks)

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b) Using the information provided, explain the changes in temperature un set R and T  
i) From day 0 to day 5 (06 marks)  
In R

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In T

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ii) After day 5 (4 marks)  
In R

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In T

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c) Explain why there was no significant change in temperature in **S** for the whole week. (02 marks)

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d) Suggest one way the above set up could be improved for better results.  
Give a reason for the suggested improvement. (02 marks)

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e) What other changes would occur in the composition of air in set up R and T during the experiment?  
(04 marks)

In R

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In T

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32. In a breeding experiment; when plants with red flowers were crossed, a total of 898 plants were produced out of which 325 had white flowers.

a) What was the recessive character? Give two reasons. (03 marks)

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b) What was the genotype of the parents. (01 marks)

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c) Using suitable symbols show the expected phenotypic and genotypic ratios in the experiment. (04 marks)

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d) Were the observed results in agreement with the laws of monohybrid inheritance? Show your working.

(02 marks)

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33. The following organisms live in a national park in Uganda. Bush rat, guinea fowl, hawk, grass hopper, Uganda Kob and grass.

a) Show the feeding relationship that exists between these organisms. (03 marks)

b) What name is given to the feeding relationship in a). (01 mark)

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c) Which organisms in the relationship are

i) Primary producers?

(01 mark)

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ii) Secondary consumers?

(01 mark)

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d) Suggest what would happen in the relationship if Uganda kobs were removed from the park. (03 marks)

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**SECTION.C (30 MARKS)**

***Answer any two questions***

34.a) What is a balanced diet (01 marks)

b) In which way is the ileum adapted for its function? (08 marks)

c) Outline the fate of food after absorption. (06 marks)

35.a) In what ways is nitrogen added and removed from the soil. (10 marks)

b) Give the importance of organic matter in the soil. (05 marks)

36.a) Describe how light, humidity and air movement affect the rate of transpiration in plants. (09 marks)

b) Describe an experiment to show that more transpiration occurs in the lower epidermis than the upper epidermis of a plant leaf. (06 marks)

37.a) Describe how the human body controls temperature. (12 marks)

b) What is the importance of having a constant body temperature? (03 marks)

**END**