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

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**553/1**

**Biology**

**(Theory)**

**Paper 1**

**2 hour 30 minutes**

**UGANDA CERTIFICATE OF EDUCATION**

**PRE-REGISTRATION EXAMINATIONS**

**BIOLOGY THEORY**

**PAPER 1**

**2 HOURS 30 MINUTES**

**Instructions**

* Answer **all** questions in section A and B plus **two** questions in section C.
* Write all answers to section A in the boxes provided, answers to section B in the spaces provided and answers to section C in the answer booklet provided.

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| --- | --- | --- |
| **FOR EXAMINER’S USE ONLY** | | |
| **Section** | **Marks** | **Examiner’s initials** |
| **A** |  |  |
| **B** 31 |  |  |
| 32 |  |  |
| 33 |  |  |
| **C** No: |  |  |
| No: |  |  |
| **Total** |  |  |

**Section A: (30 marks)**

1. An organism was found to be sessile, autotrophic and its cells had cell walls. To which kingdom was it most likely to belong?

A. Animalia B. Plantae

C. Protoctista D. Fungi

2. How would a specimen shaped as 9 appear when viewed under a light microscope?

A. 9 B. p

C. d D. b

3. A dioecious plant is one which

A. has only staminate flowers

B. has only pistillate flowers

C. has both staminate and pistillate flowers on the same plant

D. has staminate and pistillate flowers on different plants

4. A soil with large air spaces is more likely to be

A. loam soil B. sandy soil

C. fertile soil D. clay soil

5. Which of the following are the end products of digestion of starch?

A. glucose B. galactose

C. fructose D. sucrose

6. During blood clotting, which substance is responsible for the trapping of red blood cells to form a clot?

A. fibrinogen B. fibrin

C. prothrombin D. thrombin

7. Which of the following are both products of anaerobic respiration in plants?

A. alcohol and carbondioxide B. carbondioxide and lactic acid

C. alcohol and water D. water and carbondioxide

8. A leaf is usually boiled when testing for starch in order to

A. remove the chlorophyll B. obtain cooked starch

C. Kill the microorganisms in the leaf D. Burst the chloroplasts

9. In an analysis of a soil sample, the following results were obtained;

Volume of soil added = 200cm3

Volume of water added = 300cm3

Volume of water + soil after stirring = 450cm3

The percentage of air in the soil sample was?

A. 10% B. 20%

C. 25% D. 30%

10. Nutrition in a mould does not involve

A. digestion B. ingestion

C. absorption D. assimilation

11. Which of the following is a characteristic of a respiratory surface in humans **but** not of insects?

A. highly vascularised B. have large surface area

C. moist D. thin walled

12. Which of the following blood vessels have the lowest concentration of Urea?

A. hepatic portal vein B. renal artery

C. hepatic vein D. renal vein

13. Which of the following is absent in an epidermal cell of a plant leaf?

A. cellulose B. chloroplasts

C. nucleus D. cell membrane

14. Which one of the following human activities may cause pollution in water bodies?

A. fallowing B. over cultivation

C. burning of bush D. excessive use of artificial fertilisers

15. Which of the following activities produces heat in the human body?

A. constriction of skin capillaries B. shivering

C. reduction in sweating D. raising of hair on the skin

16. Plants do not grow well in water logged soils because

A. mineral salts are diluted B. the soils become too cold

C. mineral salts are leached D. there is poor aeration

17. Which of the following is not a plant excretory material?

A. urea B. cocaine

B. Oxygen D. Carbondioxide

18. Bile is important in digestion of food in the duodenum because it

A. breaks down fat B. provides acid medium

C. catalyses digestion D. activates enzymes

19. Positive response of a root to gravity is due to

A. high auxin concentration inhibiting growth

B. high auxin concentration promoting growth

C. low auxin concentration inhibiting growth

D. low auxin concentration promoting growth

20. The following are advantages of vegetative propagation except

A. maintenance of parental characteristics

B. early maturity of off springs

C. production of better off springs

D. availability of resources for growth

21. Arteries with stand pressure by;

A. having elastic walls B. possession of a wide lumen

C. having inelastic walls D. possession of valves

22. Which of the following environmental conditions results into the lowest rate of transpiration?

A. hot and windy B. cold and windy

C. hot and humid D. cold and humid

23. A child noticed that in the dry season, the population of mosquitoes reduced. Which one of the following is the best explanation for that child’s observation?

A. it was too hot for mosquitoes to mate

B. Mosquitoes starved to death due to lack of blood

C. Mosquitoes had migrated

D. ponds had dried out

24. The figure shows a pyramid of numbers for a food chain. Which of the following could form a link in the food chain?

Tertiary consumers

Secondary consumers

Primary consumers

Primary producers

A. A herd of antelope on an African plain

B. A locust swarm in a maize field

C. A plague of caterpillar on a tree

D. Round worms in a child’s gut

25. Which of the following is gaseous exchange surface of a paramecium?

A. contractile vacuole B. cell membrane

C. mega nucleus D. micronucleus

26. What is the function of the Eustachian tube in the human ear?

A. transmission of sound waves to the middle ear

B. detection of body pressure

C. transmission of sound waves to the inner ear

D. equalizing pressure in the middle ear

27. Which of the following functions of the Skelton applies only to insects?

A. provides camouflage B. protection

C. levels of locomotion D. determining body shape exactly

28. Which of the following controls the activities of other ductless glands?

A. thyroid B. adrenal

C. pituitary D. islets of Langerhans

29. Which one of the following is the correct arrangement of the stages of cell division?

A. anaphase, metaphase, prophase, telophase

B. metaphase, prophase, anaphase, telophase

C. prophase, metaphase, Anaphase, telophase

D. Anaphase, prophase, metaphase, telophase

30. What would happen to a plant whose mitochondria have been removed?

A. it would die immediately

B. it would not be able to manufacture food

C. it would not be able to produce energy

D. it would not be able to carry out osmosis

**SECTION B (40 MARKS)**

31. Table 1 shows concentration of plasma in relation to glomerular filtrate in the Bowman’s capsule and urine.

**Table 1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Substance** | **Plasma**  **(g/100cm3+)** | **Glomerular filtrate (g/100cm3)** | **Urine**  **(g/100cm3)** |
| Plasma protein | 7.5 | 0 | 0 |
| Glucose | 0.1 | 0.1 | 0 |
| Sodium ions | 0.32 | 0.32 | 0.35 |
| Chloride ions | 0.37 | 0.37 | 0.60 |
| Urea | 0.03 | 0.03 | 2.0 |
| Water | 91.9 | 91.0 | 95.0 |

a. i) Compare the plasma content and glomerular filtrate. (3 marks)

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ii) Explain how the above differences and similarities come about. (5 marks)

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b. i) What do you notice about glomerular fluids content in comparison to urine? (4 marks)

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ii) Explain the causes of the above. (5 marks)

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c. With regards to kidney function, why is low blood pressure dangerous to the body? (3 marks)

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32. Figure 2 below is of a system found in a human being. Use it to answer questions that follow;

a) Name parts labeled. (2½ marks)

A: .........................................................

B: .........................................................

C: ........................................................

D: ........................................................

E: ........................................................

b) Name one enzyme secreted in structure labeled G and state its functions.

(1½ marks)

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c) Describe the role of structure labeled F in the regulation of blood sugar level.

(3 marks)

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d) How is structure labeled H adapted for its functions? (3 marks)

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33. You are provided with table 3 showing donors and recipients of blood transfusion. Indicates compatibility and X indicates incompatibility.

Recipient

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | AB | O |
| A  Donor |  |  |  | X |
| B |  |  |  | X |
| AB | X | X |  | X |
| O |  |  |  |  |

a) Complete the table above by indicating which transfusions are compatible and which are incompatible using the symbols in the question. (2 marks)

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b) Explain why a person of blood group O can donate blood to persons of all blood groups. (3 marks)

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c) Explain why a person of blood group AB receives blood from persons of all blood groups. (2 marks)

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d) From the table above, explain the disadvantages of being of blood group O.

(3 marks)

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**SECTION C**

**Answer any two questions**

34. By giving examples, describe how seeds and fruits are dispersed from one place to another. (15 marks)

35. a) i) What problems do ticks face in their mode of life? (5 marks)

b) How are ticks adapted to their mode of life? (10 marks)

36. a) Explain the importance of the different tropic movements in plants.

(4 marks)

b) Explain how positive phototropism in a plant root are brought about. (8 marks)

c) Give three differences between communication by nerves and communication by hormones. (3 marks)

37. a) What is transpiration? (2 marks)

b) What are the disadvantages of transpiration? (3 marks)

c) How are plants adapted to minimize water loss? (6 marks)

***\*\*\*END\*\*\****