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553/1
Biology
(Theory)
Paper 1
2 ½ hours

Uganda Certificate of Education

PRE- MOCK EXAMINATION 2019

BIOLOGY(THEORY)

PAPER 1

2 HOURS 30 MINUTES

INSTRUCTIONS

- *Answer all questions in sections **A** and **B** in the spaces provided on the question paper and any two questions from section **C**.*
- *Answer section **A** by writing the correct alternative **A,B,C** or **D** in the box on the right hand side of each question.*
- *Answers to Section B must be filled in the spaces provided.*
- *Answers to Section C must be written on the answer sheets provided.*

FOR EXAMINER'S USE ONLY			
Section		**Marks**	**Examiner's Initials**
A			
B	31		
	32		
	33		
C	No:		
	No:		
Total			

SECTION A

1. Which of the following organisms belongs to class insecta?
A. Cuttle fish B. Tick
C. Silver fish D. Jelly fish

2. Compared with a mammal, a lizard requires greater muscular effort to keep its body raised above the ground because
A. It seldom uses its limbs
B. Its body is proportionally very heavy
C. Its limbs are not arranged under the trunk
D. It is descended from snakes

3. Which of the following comparisons between insect and wind-pollinated flowers is not true?

	Wind pollinated	**Insect pollinated**
A	Flowers are brightly colored.	Flowers brightly colored.
B	Pollen light and small.	Pollen heavy, others sticky.
C	Flowers odourless.	Flowers scented.
D	Stigma usually small and simple.	Stigma large and feathery.

4. Which of the following structures is found in animal cell only?
A. Large centred vacuole B. Cell membrane
C. Cytoplasm D. Flagella

5. Which one of the following properties of soil is **not** affected by its texture?
A. Mineral content B. Amount of air in the soil
C. Water retention capacity D. Soil capillarity

6. Reduced resistance to disease and poor right vision are likely to occur in an individual as a result of deficiency in vitamin
A. C B. A C. D D. B

7. Which one of the following sets of blood vessels carry blood containing the **least** amount of carbon dioxide and nitrogenous wastes respectively?
A. Renal artery and pulmonary artery
B. Vena cava and pulmonary artery
C. Pulmonary vein and renal vein
D. Renal artery and vena cava

8. Which of the following is a characteristic of a respiratory surface?
A. Hairy B. Smooth
C. Large surface area D. Thick membranes

9. The three stages of the life cycle of an insect after the egg, each one has one main function to perform in order for a species to survive. Identify such functions below.

	Larva	**Pupa**	**Imago**

A	Burrowing	Reorganizing	Pollinating
B	Feeding	Hibernating	Moulting
C	Burrowing	Resting	Flying
D	Feeding	Reorganizing	Reproducing

10. Which one of the following sets of conditions can occur at the same time in a mammalian body?
A. Vasodilation, increased sweating and contraction of erector Pilli muscle.
B. Vasodilation, reduced sweating and increased metabolic rate
C. Vasoconstriction, reduced metabolic rate and relaxation of erector Pilli muscle.
D. Increased sweating, Vasodilation and relaxation of erector Pilli muscle.

11. Which one of the following vegetative plants would appear earliest on a rocky habitat?
A. Ferns B. Lichens C. Moss D. Algae

12. Which one of the following is a correct statement about the nervous system?
A. Responses are slow B. Its effect is wide spread
C. Impulses are carried by the bloodD. Impulses are electrical in nature

13. Which of the following features is **not** found on lumbar vertebrae?
A. Neural spine B. Centrum
C. Vertebrarterial canals D. Transverse processes

14. A sample of soil was heated in a crucible until it was red. The following were recorded.
Initial weight =A
Final weight = B
A-B =X
X represents
A. Water in the soil B. Humus in the soil
C. Humus + water in the soil D. Air in the soil

15. In which of the following parts of mammalian gut **does** most absorption of water occur?
A. Colon B. Ileum
C. Stomach D. Duodenum

16. The equation, Glucose ⟶ Ethanol + Carbon dioxide + Energy, responds
A. Aerobic respiration in plants B. anaerobic respiration in animals
C. Aerobic respiration in animals D. Anaerobic respiration in plants

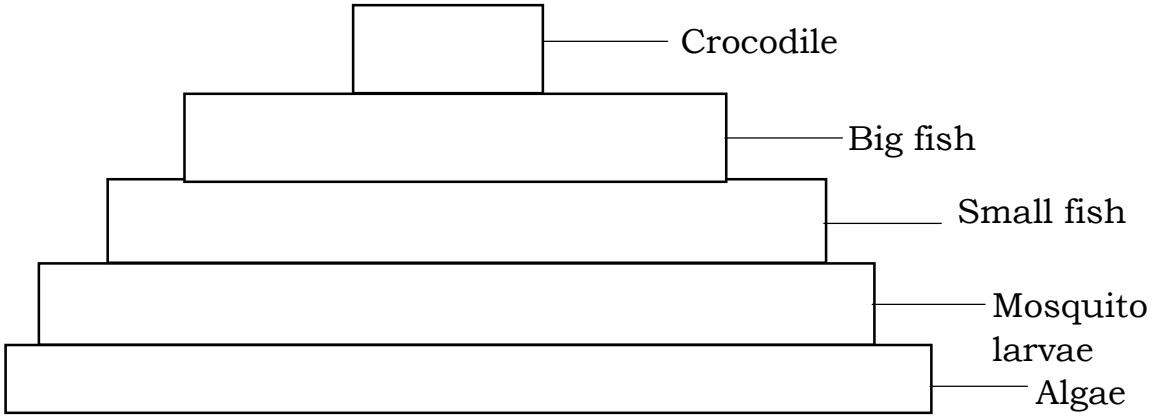
17. Which one of the following is not a homeostatic organ?
A. Lungs B. Bladder
C. Kidney D. Liver

18. Successful terrestrial life in insects is facilitated by their possession of
A. Wings B. Six legs
C. Waxy cuticle D. Three main body parts

19. Which one of the following blood vessels in the circulatory system **lacks** a pulse?
A. aorta B. Pulmonary artery
C. Hepatic artery D. Renal artery

20. Respiratory energy is believed to be used in the absorption of mineral salts by plant roots. Which of the following observations best support that hypothesis?
A. Chloride uptake is reduced in lower oxygen concentration
B. Carbon dioxide is stored in the roots
C. The root hairs provide a large surface area for gas exchange
D. Living roots give off carbon dioxide

21. Figure below is a pyramid of numbers for an ecosystem.



Which one of the following actions would result in the reduction of the number of mosquito larvae?
A. Increase in number of crocodiles B. Increase in number of big fish
C. Decease in number of small fish D. Increase in number of algae

22. Insectivorous plants are most likely found ground in
A. Soils with high organic matterB. Soils with low nitrogen content
C. Soils with low pH D. Alkaline soils
23. The importance of phototropism in plants is to enable

A. Plants grow towards mineral salts and water
B. Climbing plants to set grip on their support
C. Plants in shade grow faster and get exposed to light
D. Plant roots gain anchorage

24. Which one of the following is the **least** important reason why plants need to ensure efficient seed dispersal in nature?
A. Increasing chances of finding a better habitat for multiplication
B. Escape being eaten by animals in its original habitat
C. Reducing competition for food, resulting from over crowding
D. Ensuring better colonization of different places

25. Which of the following parts of a microscope is used to obtain a sharp image?
A. Fine adjustment knob B. Mirror
C. coarse adjustment knob D. High power objective lens

26. A doctor specializes on surgery involving the ear, nose and throat. At which level of organization is he specialized?
A. Cell B. Tissue
C. Organ D. Organ system

27. During expiration in man, the diaphragm
A. Flattens and intercostal muscles contract.
B. Flattens and intercostal muscles relax.
C. Becomes dome shaped and internal intercostal muscles relax.
D. Becomes dome-shaped and internal intercostal muscles contract.

28. Which one of the following is **not** a difference between moths and butterflies?

	Moths	**Butterflies**
A	Fly mainly at night.	Fly during day.
B	Antennae have knobs at tips.	Antennae pointed at tips.
C	Wings at rest lie horizontally.	Wings at rest lie folded vertically.
D	Rest during day.	Rest at night.

29. The following blood plasma components are involved in blood clotting except
A. Water B. Calcium
C. Prothrombin D. Fibrinogen

30. A person of blood group A can be transfused with blood of
A. Group A only B. Group A and O
C. Groups AB only D. Groups A and AB

SECTION B (40 marks)

31. The table below shows results of an investigation about the effect of a change in environment temperature on the rate of output of carbon dioxide by an endotherm. Study it and use it to answer the following questions

Rate of output of carbon dioxide (arbitrary units)	1.8	1.6	1.2	0.65	0.4	0.2
Environmental temperature/^{0}C	2.5	5	12.5	22.5	30	40

a) What conclusion can be drawn from the graph directly? (1 mark)

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b) State the rate of output of carbon dioxide at a temperature of 6^{0}C. Show your working. (1 mark)

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c) Suggest an explanation for the observed trend in the rate of carbon dioxide output as the environmental temperature decreases. (5 marks)

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d) Explain why small mammals eat food frequently. (3 marks)

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e) Explain four adaptations of endotherms to living in cold environments. (4 marks)

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32. The figure below is part of the urinary system of man.

a) Name parts labeled X, Y, P and Q. (2 marks)

X:.....

Y:.....

P:.....

Q:.....

b) State differences in composition of blood in structures a and b.(3 marks)

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c) i) The content in part labeled Y was found to be containing glucose. State the medical condition this individual was suffering from and the body part that had malfunctioned to cause that condition. (2 marks)

Medical condition:……

Body part:……

ii) Suggest the best way to help this individual in your clinic. (1 mark)

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d) Another individual was found to be passing out a lot of urine more than normal. State the medical condition this individual had and the body part that had malfunctioned to cause that condition. (2 marks)
Medical condition:……

Body part:……

33. What is meant by the following terms as applied to wild life in a game park?
i) Game cropping (1 mark)

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ii) Carrying capacity (1 mark)

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b) In an ecological study it was observed that organism A feeds on green plants, while C feeds on A. B feeds C and that D feeds on B. If all the letters A, B, C and D represent living organisms in an ecosystem, state the tropic levels of the following organisms;

A:……

B:……

Green plants:……

c) In the space below draw a feeding relationship representing only organisms B, C and D. (1 mark)

d) In a practical experiment to determine the population of rats in Kipooli ground, 75 rats were captured, marked and released. After 2 days, a second capture of 200 rats was made. It was observed that in the second capture 150 of them had not been captured before.

i) Identify the method used to determine the population of rats in this experiment. (1 mark)

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ii) Calculate the population of rats in Kipooli ground. (3 marks)

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SECTION C (30 marks)

*Attempt only **2** questions from this section.*

34. Transpiration and photosynthesis are two important processes in plants.
a) Explain how a plant benefits from;
i) Transpiration (4 marks)
ii) Photosynthesis (2 marks)

b) Describe how plants in arid areas control excessive transpiration. (9 marks)

35. a) What is a balanced diet? (1 mark)

b) Describe how the ileum is adapted for absorption of food. (6 marks)

c) Outline the fate of all absorbed food in the body. (6 marks)

d) State four components of the balanced diet that are **not** changed by digestive enzymes in man. (2 marks)

36. a) State differences between the process of inhalation and exhalation in man. (6 marks)

b) Describe the process of gaseous exchange in man. (7 marks)

c) In mammals, there is always a higher concentration of oxygen in the alveoli than in the surrounding capillaries. State two ways in which this condition is maintained. (2 marks)

37. a) Describe ways in which named human activities accelerate the rate of soil erosion. (9 marks)

b) Describe the effects of soil erosion on an aquatic ecosystem. (6 marks)

END