Name: ..... Centre/Index No: .....

Signature: ..... School.....

553/1
BIOLOGY
Paper1
(Theory)
July/ Aug. 2019
2½ hours

UGANDA TEACHERS' EDUCATION CONSULT (UTEC)

Uganda Certificate of Education

BIOLOGY

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

*Answer **ALL** the questions in section **A** and **B** plus **two** questions from section **C**.*

*Answers to section **A** must be written in the boxes adjacent to each question.*

*Answers to section **B** should be written in the spaces provided.*

*Answers to section **C** should be written on the answer booklets provided.*

For Examiner's Use Only		
Part/Question	***Marks***	***Examiner's Signature And Number***
SECTION A		
SECTION B		
SECTION C 34.		
35.		
36.		
37.		
Total		

SECTION A (30 MARKS)

Answer all questions in this section. Write the letter representing the most correct answer to each question in the box provided.

1. Which one of the following features of organisms **cannot** be used to classify a new organism?
   A. Number of body parts
   B. Shape of body
   C. Body size
   D. Number of legs

2. Which one of the following is false about viruses? They;
   A. Can only reproduce in living cells
   B. Are the smallest living things
   C. Are facultative parasites
   D. Do not have a cellular structure

3. Which of the pairs of substances consists of those that are not transported by blood?
   A. Urea and glucose
   B. Pepsin and amylase
   C. Carbon dioxide and sodium ions
   D. Insulin and energy from respiration

4. Which one of these is **not** hydrolyzed along the alimentary canal?
   A. Glycogen
   B. Lactose
   C. Galactose
   D. Maltose

5. Which of these complete the digestion of food?
   A. Trypsin and lipase
   B. Lipase and salivary amylase
   C. Trypsin and pepsin
   D. Pepsin and salivary amylase

6. Antidiuretic hormone is produced by the;
   A. Adrenal gland and decrease urine production
   B. Adrenal gland and increases urine production
   C. Pituitary gland and decrease in urine production
   D. Pituitary gland and increase in urine production

7. If a father is homozygous for blood group A and that of the mother is AB, then the possible number of genotypes of their off springs is;
   A. 2
   B. 3
   C. 6
   D. 4

8. Lactic acid accumulation in the muscles of an athlete during a race is due to;
   A. Anaerobic respiration
   B. Aerobic respiration
   C. Oxygen debt
   D. High rate of respiration

9. Which of these is a characteristic to all vertebrates?
   A. Double circulation
   B. Homeothermy
   C. Pentadyctyl
   D. Possession of cranium

10. Which of these consists of enzymes found in pancreatic juice?
   A. Amylase, peptidase, trypsin, rennin
   B. Lipase, amylase, trypsin,
   C. Amylase, pepsin, trypsin, peptidase
   D. Lipase, amylase, pepsin and maltase

11. Which one of these make the skin of a toad an effective respiratory surface while in water?
   A. Moist skin
   B. Large secretory gland
   C. Highly vascularised
   D. Rough skin

12. A heterozygous red flowered plant was crossed with a homozygous white flowered plant. What was the phenotype of the off springs if the allele for red flowers is dominant?
   A. All red
   B. All white
   C. Pink and red
   D. Red and white

13. The following results were obtained in a class experiment to determine the percentage of air in a soil sample.
Volume of water used = $100cm^3$
Volume of soil and water before stirring = $400cm^3$
Volume of mixture soil and water after stirring = $370cm^3$.
Calculate the percentage of air in soil sample
A. 7.5
B. 8.1
C. 10
D. 23.3

14. Which one of the following functions of skeleton only applies to insects?
A. Provides camouflage
B. Levers for locomotion
C. Protection
D. Determines body shape

15. Which one of these protects the mammalian embryo?
A. Chorion and amnion
B. Allontois and yolk sac
C. Amnion and yolk sac
D. Allontois and chorion

16. The following are the advantages of vegetative reproduction **except?**
A. Maintenance of parental characteristics in off springs
B. Early maturity in off springs
C. Possibility of raising off springs where otherwise was impossible
D. Production of more vigorous off springs

17. The function of a tendon is to;
A. Link bone to another bone
B. Link bone to muscle
C. Link muscle to bone
D. Provide cushioning at a joint

18. Which of the following is deficient in a person with bleeding gums?
A. Vitamin B_{12}
B. Vitamin E
C. Vitamin C
D. Vitamin K

19. A person cannot commit suicide by simply holding his breath because;
A. Accumulation of carbon dioxide in the blood compels him to start breathing again
B. Oxygen accumulated in the blood can last for a long time if not active
C. Oxygen can diffuse into his tissues through the skin and sweat glands
D. Carbon dioxide can be reused in the body

20. Continuous passing out of urine at regular short interval of time for a period of two hours would result into;
A. Diabetes inspidus
B. Dehydration
C. Diarrhoea
D. Diabetes mellitus

21. Which of these would be common to both excretory and respiratory organs?
A. Secretion of hormones to cause homeostasis
B. Secretion of nitrogenous wastes
C. Control of osmotic concentration of blood
D. Waste removal from large surface areas

22. Sudden and vigorous movement of the head continuously makes a person dizzy and lose balance because of the disturbance of;
A. Fluid in the cochleae
B. Brain being damaged
C. Fluid in the semicircular canal
D. Neck and leg muscle

23. Which of these explains why insects do not grow to the size of human beings?
A. They have simpler digestive system
B. They use spiracles whereas the humans use nostrils
C. Have open circulatory system and humans have double circulatory system
D. Have exoskeleton and humans have endoskeleton

24. The advantage of internal fertilization over external fertilization is that internal fertilization:
A. Off springs closely resemble the parents
B. Copulation and fusion of gametes are passive
C. Production of large number of gametes in unnecessary
D. Fewer individuals are produced

25. Soil with high capillarity;
A. Has high drainage
B. Has large air spaces
C. Has low porosity
D. Has large soil particles

26. A dog takes in air when;
A. Diaphragm muscles contract
B. The intercostals muscles relax
C. Excess oxygen is in the atmosphere
D. There is glucose in the liver to be oxidized

27. In an ecosystem green plants are the producers because they;
A. Store carbohydrates and store it in form of starch
B. Synthesize organic compounds from inorganic substances
C. Take in carbon dioxide and produce oxygen
D. Make the environment conducive for animals to live

28. Which of these nutrients is likely to be received by developing foetus from the placenta?
A. Waste products
B. Starch
C. Amino acids
D. Proteins

29. Which of these cells do not show specialization?
A. Red blood cells
B. Nerve cells
C. Companion cells
D. Meristematic cells

30. Which of these glands indirectly influences the rate of heart beat?
A. Pituitary gland
B. Adrenal gland
C. Pancreas
D. Thyroid gland

SECTION B

Write your answers to this section in the spaces provided

31. The table below shows the results of changes in the concentration of lactic acid in the blood of an athlete before, during and after a race study the data and use it to answer the following questions.

Time / minutes	0	10	20	30	40	50	60	70	80
Lactic acid concentration in blood mg/100cm^3	20	49	70	88	70	48	36	20	20

(a) Plot the above data in a suitable graph. *(06 marks)*

(b) Describe how lactic acid concentration varied during the period of investigation. *(03½ marks)*

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(c) Explain what happened to the body of the athlete between;

(i) 0 – 30 minutes *(02½ marks)*

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(ii) 30 – 70 minutes *(03½ marks)*

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(iii) 70 -- 80 minutes *(01½ marks)*

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(d) Why did blood still contain lactic acid after the race? *(01 mark)*

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(e) What is the effect of excessive accumulation of lactic acid in the body? *(½ mark)*

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(f) Which process occurred in the tissues during the race? *(½ mark)*

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(g) What is the significance of the process you named in (f) above? *(01 mark)*

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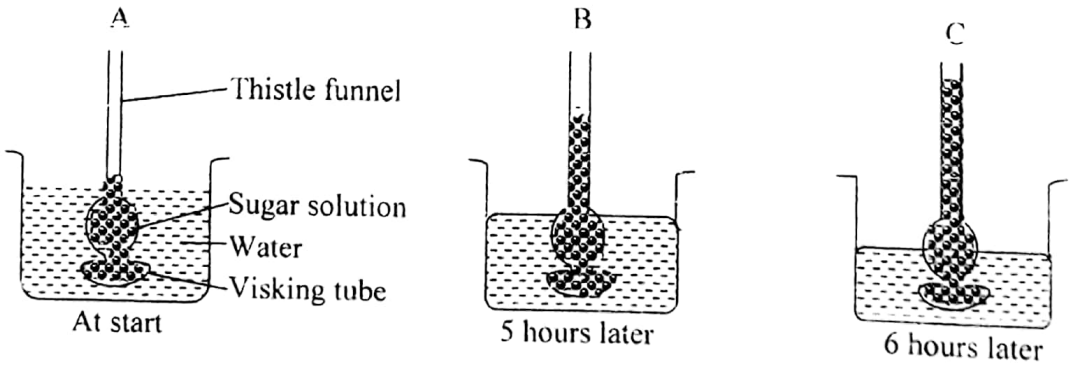
32. The diagram below shows the experimental set up to demonstrate some biological process. Study it carefully and answer the following questions;



(a) State the biological process demonstrated by the experiment. *(01 mark)*

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(b) Explain the results of the experiment 5 hours later. *(03 marks)*

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(c) Explain the results obtained after 6 hours. *(03 marks)*

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(d) Explain what would happen to the level of the solution in C in the thistle funnel if the volume of the water in the beaker had double addition of sodium chloride. *(02 marks)*

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(e) What does the above experiment demonstrate about the nature of the visking tube? *(01 mark)*

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33. The following organisms were collected from their habitats by researchers;

Organism	Habitat	Number collected
Caterpillars	Herbs	30
Small insects	Shrubs	35
Giant insects with wings and mandibles	Shrubs	25
Small birds	Shrubs	10
Weeds	Abandoned shamba	50

(a) Which habitat was most preferred by the organisms? *(01 mark)*

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(b) Give two reasons for your answer in (a) above. *(02 marks)*

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(c) What could be the reason for the low number of small birds collected? (01 mark)

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(d) Construct a food web to show the feeding relationship for all the organisms in the table. *(03 marks)*

(e) How does the method of nutrition in weeds differ from that in other organisms? *(02 marks)*

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(f) From the table, suggest one adaptation of giant insects that enables them to survive predation? *(01 mark)*

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SECTION C

Answer any TWO questions in this section

34. (a) Describe a fertile soil. *(05 marks)*

(b) Explain the different roles of plants in soil conservation. *(10 marks)*

35. (a) Explain the following observations;

(i) Plant species which are self pollinated are better adapted than those reproduced asexually. *(07 marks)*

(ii) Plant species produced by cross pollination are better adapted than those produced by self pollination. *(04 marks)*

(b) How is pollination brought about by insects? *(04 marks)*

36. (a) State three(3) secondary sexual characteristics in a female human being. *(03 marks)*

(b) Describe the main events that occur during the menstrual cycle in a mammal. *(12 marks)*

37. (a) Describe an experiment to show that light is necessary for photosynthesis. *(09 marks)*

(b) State six roles of light in plant growth. *(06 marks)*

END