

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

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553/1
BIOLOGY
Paper 1
July. 2016
2½ hours

Uganda Certificate of Education

Resourceful Mock Exams 2016

BIOLOGY
(THEORY)
Paper 1
2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

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

Answers to section A and B must be written in the spaces provided.

SECTION A (30 MARKS)

1. Which of the following groups of terrestrial animals is most adapted to water conservation?

- A. Mammals
- B. Insects.
- C. Birds.
- D. Reptiles

2. Which of the following is a class?

- A. Arthropoda
- B. Amphibia
- C. Annelida
- D. Chordata

3. Some live maggots were put in a glass tubing. Both ends were blocked with dry cotton wool. The middle part had moist cotton wool. After 20 minutes all the maggots had moved to the moist cotton wool because they_____.

- A. show a negatively nastic response to moisture.
- B. show a positively nastic response to moisture.
- C. show a negatively tactic response to dryness.
- D. show a negatively tactic response to dryness

4. Dung beetles get rid of nitrogenous wastes through structures called

- A. Nephridia
- B. tracheoles
- C. Nephrons
- D. Malpighian tubules.

5. Which one of the following animals has an exoskeleton?
A. Tapeworm
B. Locust
C. Earthworm
D. Roundworm
6. The ability to taste a certain chemical is due to a dominant gene among humans. If both parents are heterozygous, the percentage of children likely to be tasters is
A. 25
B. 50
C. 75
D. 100
7. Which one of the following would happen to turgid cells that have been placed in a concentrated salt solution for a long time?
A. Their cell vacuoles would enlarge.
B. They would not experience any change in size.
C. They would increase in volume.
D. They would become shorter.
8. If the liver of a person is damaged which of the following activities is likely to be affected ?
A. Digestion of proteins
B. Elimination of urine
C. Formation of glycogen
D. Regulation of water
9. The response of a dog when it smells or sees food is salivation. Pavlov modified this action to a new reflex in which the dog salivated when a bell was rung. The path of this new conditional reflex was
A. ear, brain, spinal cord, salivary glands
B. nose, spinal cord, brain, salivary glands
C. mouth, salivary glands, spinal cord, brain
D. eyes, brain, spinal cord, salivary glands
10. One of the properties of clay which distinguishes it from sand is that
A. it has less air in between the particles
B. it holds less water in between and around the particles
C. water moves through it more easily
D. its capillarity is lower.
11. When the triceps contracts
A. the arm is straightened
B. the hand is pulled closer to the shoulder
C. the arm is raised
D. the hand is straightened

12. 'The Sahara Desert's rapid spread to the South is a danger to human life.' Which one of the following methods would be most effective in stopping the spread of the Sahara southwards ?

- A. Planting of trees
- B. Stop nuclear tests in the atmosphere
- C. Stop charcoal-burning
- D. Practise crop rotation

13. The following parts are involved in the transport of oxygen from the atmosphere to the capillaries in the lungs.

- 1. Nostrils
- 2. Air sacs
- 3. Bronchi
- 4. Trachea
- 5. Capillaries

Which of the following is the correct route of oxygen from the atmosphere to the capillaries?

- A. 1,2,3,4,5
- B. 1,4,3,2,5
- C. 1, 3, 2, 4, 5
- D. 1, 4, 2, 3, 5

14. The muscular energy used by a squirrel while climbing up a tree originates from the sun. Which of the following is the correct sequence in which the energy has been transformed?

(i) Digestion of starch in the squirrel (ii) Deposition of starch in a fruit (iii) Tissue respiration in the squirrel (iv) Synthesis of sugar in a leaf

- A. (iv), (i), (iii), (ii)
- B. (ii), (iv), (i), (iii)
- C. (iv), (ii), (i), (iii)
- D. (i), (iv), (ii), (iii)

15. Where in the maize grain are most carbohydrates stored ?

- A. Cotyledon
- B. Radicle
- C. Endosperm
- D. Plumule

16. In which one of the following places would the plant have the highest transpiration rate?

- A. In a dark and hot room.
- B. In a cool and well lighted room.
- C. In a dark and cool room
- D. In a hot and well lighted room.

17. In which region of the mammalian kidney does pressure filtration occur?

- A. Glomerulus
- B. Proximal convoluted tubule
- C. Loop of Henle
- D. Distal convoluted tubule.

18. If a woman who is heterozygous for colourblindness marries a normal man, which of the following will be true of their offspring?

- A. All of their sons will be colourblind.

- B. All of their daughters will be carriers of colourblindness.
- C. One half of their children of either sex may receive the abnormal allele.
- D. All of their children will be carriers.

19. In the classification of organisms which of the following arrangements has the correct order of the increasing number of species?

- A. Dictyoptera,insecta,arthropoda,animalia.
- B. Animalia,arthropoda,insecta,dictyoptera.
- C Arthropoda,dictyoptera,insecta,animalia.
- D Insecta,animalia,dictyoptera,arthropoda.

20 . Where in the bean seed are most carbohydrates stored?

- A. Cotyledon
- B. Radicle
- C. Endosperm
- D. Plumule

21. To which trophic levels do the organisms that are found in a grassland having antelopes grazing in it belong?

	Antelopes	Grass
A	Decomposers	Primary Consumers
B	Decomposers	Secondary consumers
C	Primary consumers	Primary producers
D	Primary producers	Primary Consumers

22. Which hormones promote the processes shown?

	Development of the graafian follicle	Development of the corpus luteum	Proliferation of the endometrium
A	Progesterone	Luteinising hormone	Follicle stimulating hormone
B	Luteinising hormone	Progesterone	Follicle stimulating hormone
C	Progesterone	Follicle stimulating hormone	Luteinising hormone
D	Follicle stimulating hormone	Luteinising hormone	Progesterone

23. A biologist found an animal which he thought was a new species. It had a cylindrical body about 13 cm long and 10 mm in diameter. It had a hard outside skin with many body segments and more than 20 legs. Into which one of the groups below would you have classified this animal?

- A. Insecta
- B. Myriapoda
- C. Crustacea
- D. Arachnida

24. Which of the following bacteria is responsible for nitrogen fixation?

- A. Azotobacter.
- B. Nitrobacter.
- C. Nitrosomonas.
- D. Staphylococcus.

25. Which of the following mineral nutrients are constituents of haemoglobin?

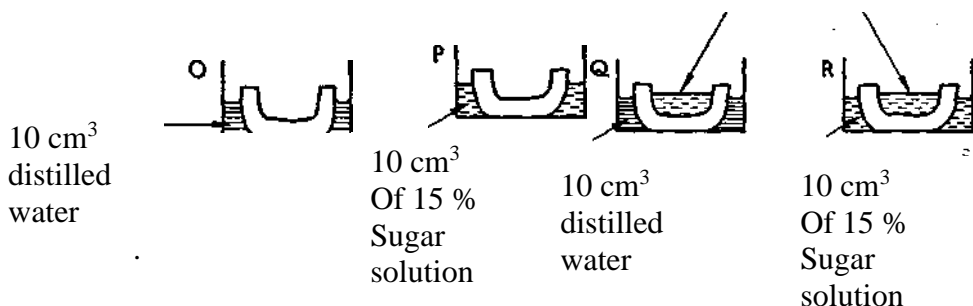
- A. Potassium and sulphur.
- B. Nitrogen and Iron.
- C. Calcium and phosphorus.
- D. Zinc and copper.

26. Contraction of the internal intercostal muscles results into

- A. increased pressure in the chest cavity.
- B. ribs moving outwards and upwards.
- C. increased volume of the chest cavity.
- D. flattening of the diaphragm

27

10 cm³
of 15 %
Sugar
solution



O, P, Q, and B are sets of experiments to study osmosis using freshly cut potato tubers. To start with, each petridish contains 10 cm³ of a liquid. In which of the petridishes will the level of the liquid be lowest ?

- A. O
- B. P
- C. Q
- D. R

27. Which one of the following is likely to be due to deficiency of magnesium in plants?

- A. Stunted growth and poor root development.
- B. Poor growth and yellow leaves.
- C. Tall slender stems with few leaves.
- D. Short plants with well developed root system.

28. Which one of the following statements would explain why a bean seedling loses weight during the first weeks after germination?

- A. The seedling loses more water than it absorbs.
- B. Soluble food materials are converted to starch.

- C. The stored food is used up during respiration.
- D. Soluble food materials are lost into the soil.

29. Which of the following is NOT a role of humus in the soil?

- A. Improving soil aeration.
- B. Prevention of soil erosion.
- C. Water retention.
- D. Increasing soil fertility.

30. Which of the following fins in a fish is used for breaking when the fish is locomotion?

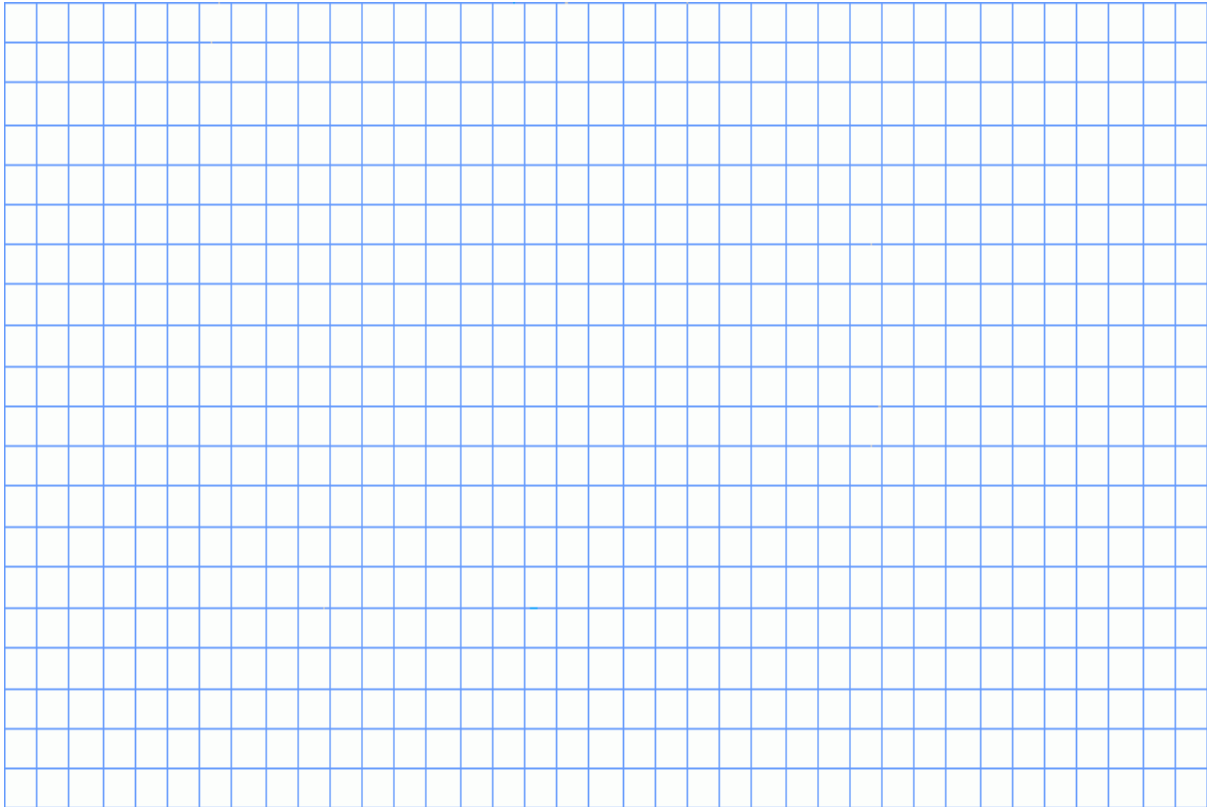
- A. Anal
- B. Pelvic
- C. Dorsal
- D. Ventral

SECTION B (40MARKS)

31. The following results were obtained from a study of the population growth of fruit flies, *Drosophila*

Time (weeks)	1	2	3	4	5	6	7	8	9	10
No. of flies	20	44	82	145	221	275	320	312	295	270

a) i) On the graph paper provided, plot the graph of *Drosophila* population against time in weeks



(ii) Describe the trend of the graph during the 10 weeks.(3 marks)

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iii) Explain the trend of the graph. (3 marks)

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(vi) Give two reasons for the change which took place after seven weeks. (2 marks)

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(b) At the seventh week, it was observed that some of the flies were red-eyed and others white eyed. In the previous generation, however, all the flies were red-eyed.

(i) If the two alternative eye colours are inherited according to the Mendelian laws, which one of them is recessive? (1 mark)

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ii How many of the flies counted at the seventh week were red-eyed ? (Show your working.)
(2 marks)

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32 One of the methods used by farmers to control crop parasites and pests is the 'Biological Control' method.

(a) How is Biological Control used to reduce the numbers of crop parasites and pests? (2 marks)

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b) What other common method do farmers use to control insect pests and parasites apart from the manual methods ? (1 mark)

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c) Give two main disadvantages of this method as compared with the Biological Control method. (2 marks)

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d) Coffee farmers in East Africa once realised that in the presence of certain ants, coffee mealybugs were piercing and sucking the inner juices of young coffee berries. The mealy bugs could be destroyed by introducing ladybirds that ate them, but ladybirds are eaten by the ants. Ants also eat mealy bugs.

(i) What are the crop pests mentioned in this passage? (1 mark)

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(ii) How could these pests be controlled? (1 mark)

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d) Construct a food web to illustrate feeding levels in d) above. (3 marks)

33. a) A number of organisms of Kingdom plantae reproduce by seed or spore formation.

i) State how advantageous and disadvantageous it is for such an organism to reproduce by seed as opposed to spore formation. (Give two answers for each.) (4 marks)

Advantages

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Disadvantages

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b i) Give the reproductive behavior that justifies why advanced chordates increase in number even when their rate of reproduction is low.(1 mark)

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b ii) Give two specific examples of such chordates that are applicable to b i).(2 marks)

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d) State three roles played by the placenta in man.(3 marks)

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SECTION C (30 MARKS)

Attempt only two questions from this section

34 a) Distinguish between the characteristics of loam and clay soils. (10 marks)

b) What are the roles of invertebrates in soil improvement? (5 marks)

35. a) Outline the characteristic features of a respiratory surface.(5 marks)

b) Describe the mechanism by which gases are brought into and moved out of the respiratory organs of a named mammal. (10marks)

36 a) Why are there less stomata found on the lower epidermis of a water plant than the upper epidermis.(05 marks)

b) Describe an experiment to show that transpiration occurs in plants.(10 marks)

37 a) What causes global warming? (03 marks)

b) Describe how man's activities lead to air pollution. (12 marks)

END