

Candidate's Name: .....

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

553/1

**BIOLOGY**

(Theory)

**Paper 1**

**Feb. / Mar. 2020**

**2.5 hours**

**RESOURCE EXAMINATIONS SET NUMBER ONE**

**Uganda Certificate of Education**

**BIOLOGY**

**(THEORY)**

**Paper 1 2 hours 30**

**minutes**

**INSTRUCTIONS TO CANDIDATES:**

*This paper consists of sections A, B and C.*

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

*Write answers to section A in the boxes provided, answers to section B in spaces provided, and answers to section C in the answer booklet provided.*

<b>For Examiner's Use Only</b>			
<b>Section</b>		<b>Marks</b>	<b>Examiner's signature and No.</b>
<b>A</b>	<b>No. 1-30</b>		
<b>B</b>	<b>No. 31</b>		
	<b>No. 32</b>		
	<b>No. 33</b>		
<b>C</b>	<b>No.</b>		
	<b>No.</b>		

<b>Total</b>		
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**SECTION A (30 MARKS)**

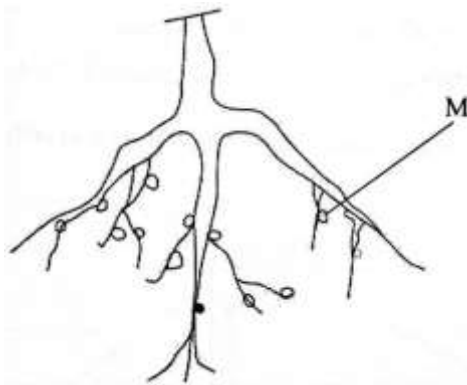
Answer **all** questions in this section. Write the letter representing the correct answer to each question in the boxes provided.

1. An organism has a cylindrical body, over 30 segments, two pairs of legs per segment and bears mandibles. To which class of arthropods would you place it? **A.** Diplopoda.  
**B.** Insecta.  
**C.** Chilopoda.  
**D.** Crustacean.

2. During the Biuret's test, 2cm<sup>3</sup> of dilute sodium hydroxide NaOH was added to 2cm<sup>3</sup> of solution followed by 3 drops of copper (II) sulphate solution, a purple ring formed at the surface of the solution and rest of the solution remained blue. This was caused by the error of?

- A.** Adding too little of the reagents which made the reaction incomplete.  
**B.** Adding too much of the reagent which made the reaction incomplete.  
**C.** Not shaking the mixture.  
**D.** Heating the mixture.

3. The diagram below is a root of a dicotyledonous plant.



The importance of the organism found in structure labelled m is to

- A. Convert free nitrogen in air to nitrate which is absorbed by plants.
- B. Store absorbed water for the plant.
- C. Store manufactured food for the plant.
- D. Carryout gaseous exchange for the plant.

4. When lumps of soil for clay, loam and sand are rolled in hands, the ease with which they crumble is always in the reducing order as. **A.** Clay, sand, Loam.

- B. Sand, Clay, Loam.
- C. Sand, Loam, Clay.
- D. Clay, Loam, Sand.

5. Four membranes **P,Q,R** and **S** were found to have average of **3,4,12** and **2** mitochondria respectively per cell. Which membrane is most likely to allow passage of materials by active transport?

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

6. An adaptation by plants to obtain nitrogen include all the following except? **A.** Mycorrhiza on plant roots.

- B. Bacteria in root nodules.
- C. Possession of aerial shoots.
- D. Being insectivorous.

7. Which one of the following is the correct route taken by blood on leaving the heart in a fish?

- A. Gills → Body → heart.  
→  
→  
→
- C. Gills → Heart → Body.  
→
- D. Body Heart Gills.
- B. Body Gills Heart.
- 

8. The rapid elongation of epicotyl during germination causes? A. Delay in emergency of photosynthetic leaves.

- B. Cotyledons to grow above the ground.  
C. Early emergency of photosynthetic leaves.  
D. Cotyledons to remain below the ground.

9. Which one of the following does not contribute to flight in birds? A. Quill feather.

- B. Hollow bone.  
C. Down featgher.  
D. Strong pectoral muscles.

10. The following are parts of a plant seed. (i) Testa. (ii) Plumule. (iii) Radicle. (iv) micropyle. (v) Cotyledon. Which of these parts play a role in protection of the embryo? A. (ii) and (iii).

- B. (i) and (v)  
C. (i) Only.  
D. (i), (ii), (iii) and (iv).

11. When a unique plant structure was studied, it was found to possess buds, nodes and internodes. This can be best classified as? A. Leaf.

- B. Root.  
C. Flower.  
D. Stem.

12. The offsprings of a cross between short rooted radicle and long rooted radicle plants were found to always be oval rooted. This is an example of? **A. Incomplete dominance.**

**B. Mutation.**

**C. Complete dominance.**

**D. Crossing over.**

13. Which pair of food stuffs provide energy during starvation? **A. Carbohydrates and proteins.**

**B. Carbohydrates and lipids.**

**C. Lipids and proteins.**

**D. Carbohydrates and vitamins.**

14. A fruit has the following characteristics (i) Air spaces.

(ii) Fibrous mesocarp.

(iii) Spongy seed coat.

Which of the following is the main dispersal agent for the fruit?

**A. Animals.**

**B. Self-mechanism.**

**C. Wind.**

**D. Water.**

15. Which one of the following methods can be used to collect very delicate and small insects found on the back of trees? **A. Sweep net.**

**B. Pooter.**

**C. Pit fall trap.**

**D. Quadrant.**

16. Which cell changes shape to carry out its normal function? **A. Muscle cell.**

- B. Neuron.
- C. Root hair cell.
- D. Xylem vessel.

17. The function of diaphragm on a microscope is to? **A.** Magnify the specimen.

- B. Regulate the amount of light.
- C. Reflect light into the stage.
- D. Focus the specimen clearly.

18. Which one of the following is the role of efferent vessel of the nephron? **A.** Drains the glomerulus.

- B. Supplies the glomerulus.
- C. Filters the blood.
- D. Purifies the blood.

19. Which one of the following factors reduce interspecific competition in a community? **A.** Large number of species.

- B. High intraspecific competition.
- C. Resource partitioning.
- D. Similar predator-prey strategies among the species.

20. Excessive use of pesticides in the long run affects mostly? **A.** Carnivores.

- B. Parasites.
- C. Producers.
- D. Herbivores.

21. Which part of the eye contains blood vessels that supply oxygen and nutrients and removes metabolic wastes from the eye? **A.** Retina.

- B. Choroid.
- C. Ciliary body.

D. Cornea.

22. An organism has 26 chromosomes in its brain cells. The number of chromosomes in its gamete will be? **A.** 26.

**B.** 52.

**C.** 23.

**D.** 13.

23. Which of the following stores carbon dioxide for long in the carbon cycle?

**A.** Living plants.

**B.** Dead plants.

**C.** Fossils.

**D.** Living animals.

24. Mammals have a higher capacity to learn than other animals due to having **A.** Medulla oblongata.

**B.** Specialized cerebellum.

**C.** Hypothalamus.

**D.** Enlarged cerebrum.

25. Production of smooth and light pollen grains is an adaptation for?

**A.** Cross pollination

**B.** Insect pollination.

**C.** Wind pollination.

**D.** Self-pollination.

26. Which one of the following mineral deficiency in plants may lead to poor root growth? **A.** Iron.

**B.** Copper.

**C.** Calcium.

D. Phosphorus.

27. In the duodenum, products ready for absorption are those of digestion of? A. Starch and lipids.

- B. Starch only.
- C. Proteins and lipids.
- D. Lipids only.

28. The existence of ring worm on human skin is an example of? A. Parasitism.

- B. Mutualism.
- C. Commensalism.
- D. Symbiosis.

29. Which one of the following is not a nervous problem? A. Tetanus.

- B. Meningitis.
- C. Polio.
- D. Elephantiasis.

30. In which of the following organisms would gaseous exchange by simple diffusion be highly effective?

A.  $\frac{\text{Surface area}}{\text{Volume}} = \frac{20}{5}$

B.  $\frac{\text{Surface area}}{\text{Volume}} = \frac{10}{2}$

C.  $\frac{\text{Surface area}}{\text{Volume}} = \frac{10}{8}$

D.  $\frac{\text{Surface area}}{\text{Volume}} = \frac{50}{8}$



**SECTION B (40 MARKS)**

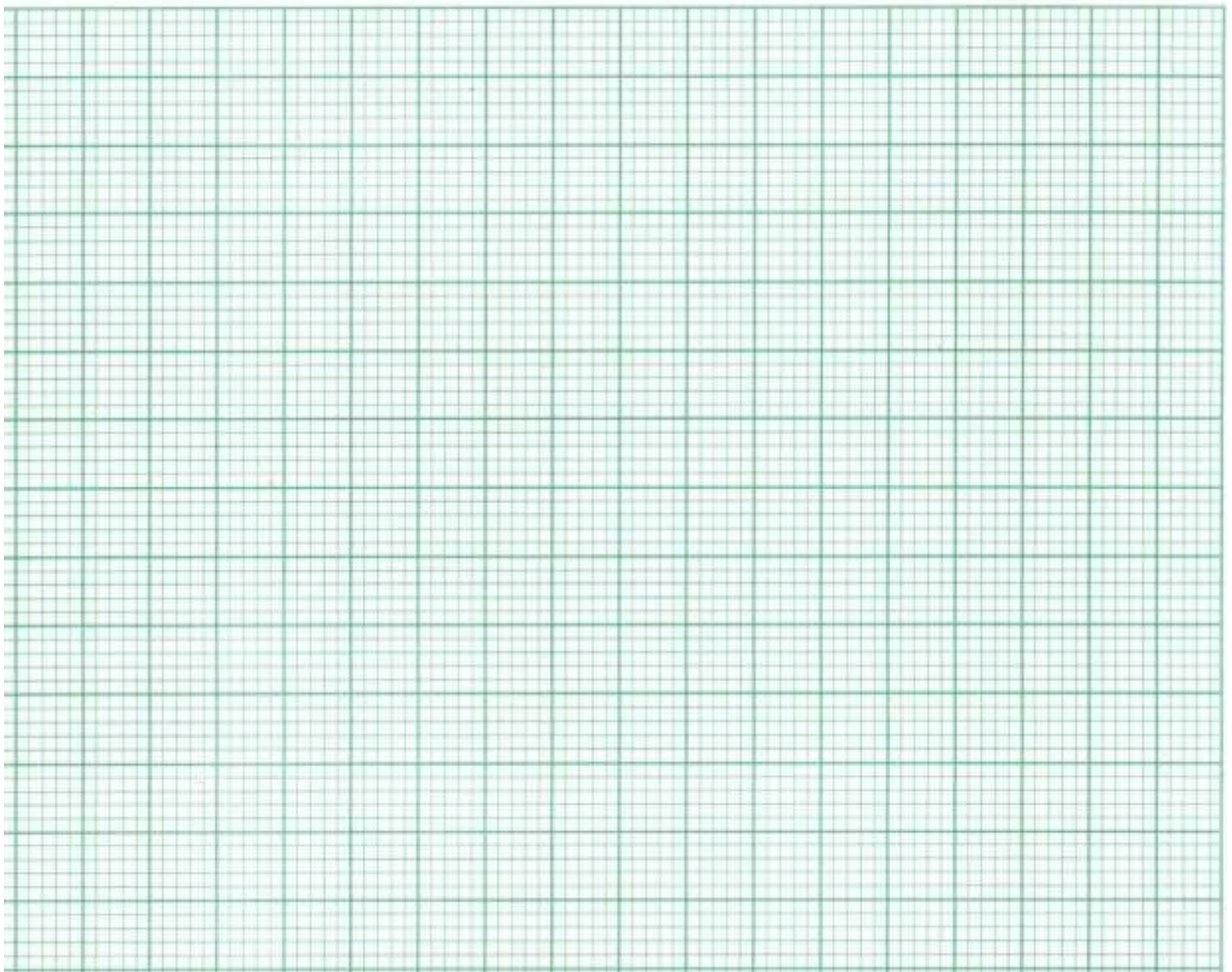
Answer **all** questions in this section. Answers **must** be written in the spaces provided.

- 31.** Association of Biology Educators (**ABE**) monitored population of two animal species **A** and **B** at Entebbe botanical gardens. They recorded population of each animal every after four weeks for a period of thirty two weeks. Results obtained are shown in the table below, study it and use it to answer questions that follow.

<b>Time</b> (weeks)	4	8	12	16	20	24	28	32
Population of Animal <b>A</b>	10	20	28	30	20	10	22	32
Population of Animal <b>B</b>	5	10	15	25	28	15	11	20

(a) Represent the above information on a suitable graph.

(08 marks)



(b) Which of the two animals represent;

(i) Prey

(01 mark)

.....

(ii) Predator

(01 mark)

.....

(c) Give a reason for your answers in (b) above.

(02 marks)

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(d) From the graph, explain the variation of animal population with time. (08 marks)

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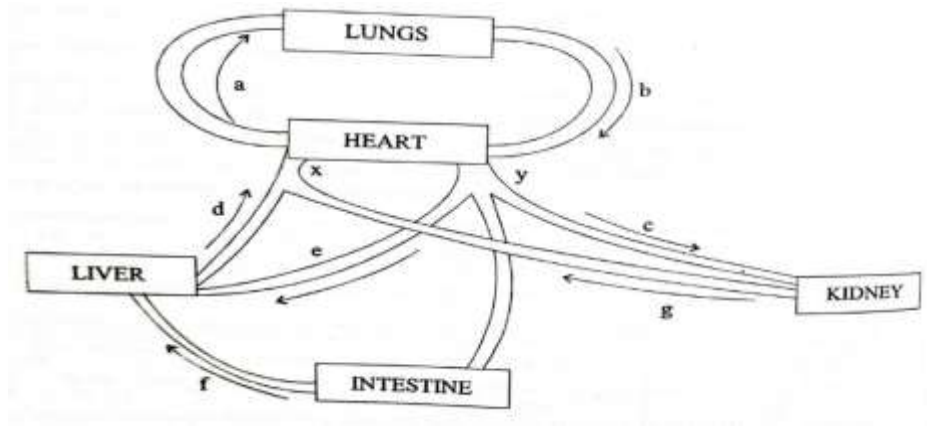
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32. Figure below represents blood vessels supplying selected organs. The arrows show the direction of blood flow.



(a) Name blood vessels a, b, c, d, e, f. (03 marks)

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.....  
.....

(b) State the differences in composition of blood in blood vessels;

(i) c and g (02 marks)

.....  
.....  
.....

(ii) a and b (01 marks)

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.....  
.....

(iii) d and f

(02 marks)

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(c) Explain the difference in blood pressure in blood vessels x and y.

(02 marks)

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33. (a) Complete the table below by filling in the examples of physical digestion, the part of alimentary canal where it takes place and one importance of the physical digestion mentioned in the human body. (04 marks)

<i>Example of physical digestion</i>	<i>Part of alimentary canal</i>	<i>importance</i>
(i)		
(ii)		
(iii)		

(b) State three ways in which the ileum is adapted for

(i) Digestion of food substances.

(03 marks)

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.....  
**(ii)** Absorption of food substances. **(03 marks)**

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**SECTION C (30 MARKS)**

Attempt any **two** questions of your choice from this section. *Answers to these questions must be written in the answer booklets provided.*

**34. (a)** Give the features of a plant cell that distinguishes it from an animal cell, and in each case, state the function of the feature you have given. **(04 marks)**

**(b)** State reasons why plants do not have a specialized respiratory surface. **(04 marks)**

**(c)** Describe how plants are suited for gaseous exchange. **(04 marks)**

**(d)** Give three ways in which respiration in plants differs from photosynthesis. **(03 marks)**

**35. (a)** Explain how ultrafiltration and selective reabsorption result into formation of hypertonic urine in mammals. **(10 marks)**

**(b)** Describe an experiment you would carry out to test for the presence of glucose in the urine of a person with malfunctioning kidneys.

**36. (a)** Describe how amount of light entering the eye is controlled. **(06 marks)** **(b)**

Describe how each of the following parts of the eye is adapted to its function.

**(i)** Retina **(03 marks)**

**(ii)** Choroid **(03 marks)**

(iii) Lens

*(03 marks)*

**37. (a)** Describe the structure and function of different types of feathers in a bird.

*(06marks)*

**(b)** Briefly explain how each of the following flight movements take place in a bird.

(i) Flapping

*(03 marks)*

(ii) Gliding

*(02 marks)*

(iii) Soaring

*(02 marks)*

**(c)** Outline the adaptations of birds to flight.

*(02 marks)*

**END**