NAME:		INDEX NO:	
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553/1
BIOLOGY THEORY
Paper 1
August, 2019
2 hours

UNNASE Community

UNNASE MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY THEORY

PAPER 1

TIME : 2 HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES:

- *This paper consists of Section **A, B** and **C**.*
- *Attempt all questions from Section **A** and **B** and any **two** questions from Section **C**.*
- *Answers for Section **A** must be written in the answer boxes on the right hand of each question.*
- *Answers to Section **B** must be filled in the spaces left for each question and for Section **C** on the additional answer sheets provided.*

SECTION A: (30 MARKS)

1. During expiration in man, the diaphragm..
   A. flattens and the intercostal muscles contract.
   B. flattens the intercostal muscles contract.
   C. becomes dome-shaped and the internal intercostal muscles relax.
   D. becomes dome-shaped and the internal intercostal muscles contract.

2. The hormone that is responsible for conversion of glycogen to glucose in the liver is
   A. secretin B. thyroxine
   C. adrenalin D. insulin.

3. Which of the following is characteristic of a soil with low capillarity?
   A. Poor water retention
   B. Poor drainage
   C. Poor aeration
   D. Small particles

4. The tapeworm *Taenia saginata* has a primary and a secondary host. Which of the following are the primary and secondary hosts respectively?
   A. Pig and man B. Cow and man
   C. Man and cow D. Man and pig.

5. A good mammalian respiratory surface should be...
   A. dry with large surface area.
   B. moist with reduced surface area.
   C. dry with many blood vessels.
   D. moist with many blood vessels.

6. Which one of the following structures is found in cervical vertebrae only?
   A. Centrum
   B. Neural spine
   C. Transverse process
   D. Vertebra – arterial canal

7. Which one of the following statements best explain why urine does not normally contain glucose?
   A. Glucose molecules are too large to pass through the capillaries of the glomerulus
   B. Glucose present in the renal tubule is changed to carbon dioxide and water.
   C. All the glucose filtered is re-absorbed back into the blood in the renal tubules.
   D. The bladder re-absorbs all the glucose filtered.

8. Which one of the following responses is a directional growth movement?
   A. Taxis
   B. Reflex
   C. Tropism
   D. Nastism

9. Meiosis leads to the production of ...
   A. Two daughter cells each with original number of chromosomes
   B. Four daughter cells each with original number of chromosomes
   C. Two daughter cells each with half the original number of chromosomes
   D. Four daughter cells each with half the original number of chromosomes

10. If energy from the sun was cut off from an ecosystem containing the following organisms:
   (i) Green plants
   (ii) Herbivores
   (iii) Saprophytes
   (iv) Carnivores

   In which order would the organisms die out?
   A. (i), (ii), (iii) and (iv)
   B. (i), (ii), (iv) and (iii)
   C. (iii), (i), (ii) and (iv)
   D. (i), (iii), (ii) and (iv)

11. The structure in insects that serve as respiratory surfaces for gaseous exchange are
   A. Trachea
   B. Bronchioles
   C. Tracheoles
   D. Spiracles

12. The following are factors that affect the rate of transpiration:
   (i) High temperature
   (ii) High relative humidity
   (iii) Low atmospheric pressure.
   (iv) Low light energy

   Which two of these would favour increased transpiration?
   A. (i) and (ii)
   B. (i) and (iii)
   C. (ii) and (iv)
   D. (iii) and (iv)

13. Which one of the following organisms is **not** a heterotroph?
    A. Mushroom
    B. Alga
    C. Tick
    D. Grass hopper

14. Photosynthesis is said to have a pair of raw materials, a pair of conditions, and a pair of products. Which of these is the correct set?
    A. Carbon dioxide and light; water and chlorophyll; oxygen and sugars.
    B. Water and light; carbon dioxide and chlorophyll; oxygen and sugars.
    C. Light and chlorophyll; carbon dioxide and sugar; water and oxygen.
    D. Carbon dioxide and water; light and chlorophyll; oxygen and sugars.

15. Which of the following is common to both respiration and photosynthesis?
    A. Energy is released.
    B. Occur in all living cells.
    C. Food is oxidized.
    D. Oxygen,CO_2 and H_2O are involved.

16. In what part of the green flowering plant does meiosis occur?
    A. Seed
    B. Flower
    C. Fruit
    D. Short apex

17. Which one of the following pairs consists of only cells **without** nuclei when mature?
    A. Sieve tube cells and companion cells.
    B. Erythrocytes and leucocytes.
    C. Sieve tube cells and erythrocytes.
    D. Companion cells and leucocytes.

18. The following are characteristics of flowers.
    (i) Large feathery stigma
    (ii) Large brightly coloured petals
    (iii) Produce large quantities of pollen grains.
    (iv) Flowers are often scented.
    (V) Possess nectary glands.
    Which of them belong to wind pollinated flowers?
    A. (ii) and (v) B. (i) and (iii).
    C. (ii) and (iv) D. (iv) and (v).

19. Meiotic cell division is important because it ensures that
    A. There is variation in the number of chromosomes
    B. The number of chromosomes of a species is not double at fertilization
    C. The chromosomes of the daughter cells are identical
    D. Bad traits are not passed on from parents to offspring

20. Which of the following substances are secreted in mammalian sweat?
    A. Urea, ammonia, water
    B. Urea, carbon dioxide, sodium chloride
    C. Urea, water, sodium chloride
    D. Urea, carbon dioxide, water

21. Which one of the following characters shows discontinuous variation?
    A. Blood groups
    B. Height
    C. Intelligence
    D. Skin colour in people

22. Which of the following make the skin of a toad an effective respiratory surface?

    (i) Moist surface
    (ii) Rough skin
    (iii) Rich blood supply to the skin
    (iv) Large numbers of secretory glands on the skin
    (v) Characteristic dark brown colour.
        A. (i) and (iii)
        B. (ii) and (iv)
        C. (ii) and (v)
        D. (iv) and (v)

23. What disease would you be controlling by pouring molluscicides in water?
    A. Schistosomiasis
    B. Guinea worm infestation
    C. Typhoid
    D. Cholera

24. Which one of the following structural adaptations of leaves is important for absorption of raw materials during photosynthesis?

A. Thin walled with a transparent waxy cuticle.
B. Large numbers of chloroplasts in the palisade layer.
C. Large intercellular air spaces in the spongy layer.
D. Broad and flat shapes of leaves.

25. Which one of the following is not a property of a fully turgid plant cell?

A. The vacuole has maximum volume
B. There is no more absorption of water by the cell
C. The cell wall resists further expansion of the vacuole
D. The cytoplasm is only slightly separated from the cell wall

26. What would happen if a ligament broke?

A. Muscle pull would result.
B. Muscles would be detached from bones.
C. There would be dislocation of bones during movement.
D. Synovial fluid would leak out from a synovial membrane.

27. Which of the following has no effect on the rate of diffusion?

A. Density of diffusion medium
B. Length of diffusion pathway.
C. Size of diffusion molecules.
D. Concentration gradient.

28. The rate of glomerular filtration is highest in ...

A. man
B. amphibians
C. fresh water fishes
D. marine fishes.

29. Which of the following represents diameter of a silt particle?

A. 2 - 0.2mm
B. 0.2 – 0.02mm.
C. 0.02 – 0.002mm
D. Less than 0.002mm.

30. If a normal heterozygous man marries an albino woman,what will be the genotype of the offspring?

A. Aa and aa.
B. Aa only.
C. AA and aa
D. Aa and AA.

SECTION B.(*40 marks*).

31. The table below shows the percentage concentration of substances formed from plasma.

Substance	Glomerular filtrate (%)	Urine (%)	Concentration factor
Water	90	95	
Glucose	0.02	0.01	
Urea	0.03	2.0	
Sodium ions	0.32	0.35	

a) Represent the above data on a bar graph excluding the concentration factor **(5 marks)**

b) Complete the table above by calculating the concentration factor **(2marks)**

c) For each of the substances listed below, explain the difference in the percentages between glomerular filtrate and urine. **(8 marks)**

(i) Glucose

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II) Water

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III) Urea

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d) Explain how the glomerular filtrate is formed. **(5 marks)**

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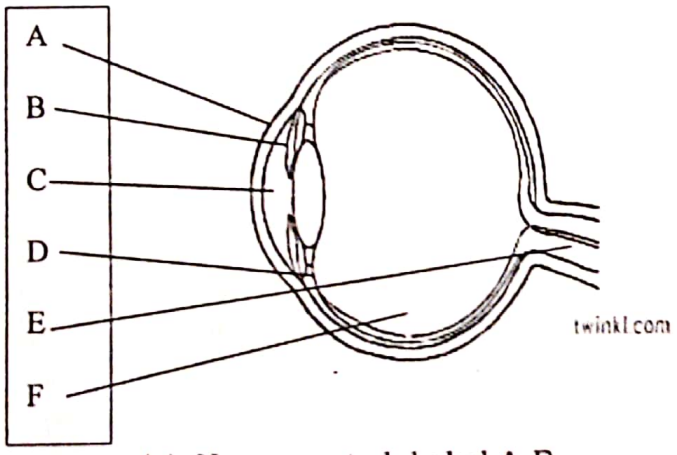
32. Study the diagram below and answer the questions that follow.



(a) Name parts labeled A-F **(3 marks)**

A .....

B .....

C .....

D .....

E .....

F .....

(b) Describe the adjustments that would occur in part D when one is looking at a star. **(3 marks)**

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(c) Explain how myopia is corrected using lenses. **(4 marks)**

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33. The dental formula below was found in a dead animal after being killed by a car on the road.

$$i\ \frac{0}{1}\quad c\ \frac{0}{0}\quad pm\ \frac{3}{2}\quad m\ \frac{3}{3}$$

a) (i) Define the term dental formula **(2 marks)**

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(ii) Calculate the number of teeth in the jaws of the animal **(2 marks)**

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b) With a reasons suggest the diet of the animal **(2 marks)**

(i) Diet

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(ii) Reason

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c) State four adaptations of the animal to its diet. **(4 marks)**

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SECTION:C (*30 MARKS*)

(Attempt any two questions from this section.)

34. (a) Giving two examples in each case explain what you understand by the terms

(i) Commensalism
(ii) Parasitism **(6 marks)**

(b) How are ticks adapted to their mode of life? **(9marks)**

35. (a) Describe the adaptations of a bird's skeleton to flight.

(5 marks)

(c) With the aid of diagrams describe how small insects fly.
(10 marks)

36. (a) Explain why water is necessary for germination? **(5 marks)**.
(b) Describe an experiment to show that oxygen is necessary for germination. **(9marks)**

37. Describe how oxygen in the atmosphere reaches the hands.

(15 marks)

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