



*Dr. Blosa Science*

Sponsored by  
**The Science Foundation College**  
**Uganda East Africa**  
 Senior one to senior six  
 +256 778 633 682, 753 802709  
**Based On, best for science**

[digitalteachers.co.ug](http://digitalteachers.co.ug)



Nurture your dreams



NAME:.....

STREAM:.....

## SENIOR FOUR

553 / 1

## BIOLOGY

## PAPER 1

## EXAM 6

**FOR CONSULTATION CALL 0778 633682**

2 HOURS 30 MINUTES

### INSTRUCTIONS TO CANDIDATES:

- Answer ALL questions in Section A and B and any TWO from Section C.
- For Section A write your correct corresponding answer in the box.
- For Section B write the answers in the space provided.
- For Section C write your answers on the attached answer sheets.

For Examiner's Use Only	
A	
B	
C	
Total	

## SECTION A

1. Which one of the following parts of a microscope regulates the amount of light entering the lens system
- A. Turret
  - B. Diaphragm
  - C. Mirror
  - D. Stage

2. Living organisms are capable of reacting to the changing conditions in the environment. This process is referred to as

- A. Growth
- B. Movement
- C. Sensitivity
- D. Death

3. A vertebra has the following characteristics

- (i) Short neural spine
- (ii) Short transverse process
- (iii) Vertebral arterial canal

- A. Lumbar vertebra
- B. Thoracic vertebra
- C. Cervical vertebra
- D. Tail vertebra

4. Which one of the following is the relative size limit in millimeters for silt

- A. 2.0 – 0.20mm
- B. 0.02 – 0.002mm
- C. 0.20 – 0.02mm
- D. Below 0.002mm

5. A researcher captured an animal and noted its dental formula as follows

$$i \frac{2}{1}$$

$$c \frac{0}{0}$$

$$pm \frac{3}{2}$$

$$m \frac{3}{3}$$

Which animal was captured?

- A. A hog
- B. A fox
- C. An antelope
- D. A rabbit

6. Antibodies defend the body against infections caused by bacteria in the following ways except by

- A. Production of opsonins to adhere on the surface of bacteria for easy destruction.

- B. neutralizing bacteria poisons through production of anti toxins.  
C. Inhibiting production of agglutinins thus scattering bacteria  
D. Production of lysins to dissolve bacterial coats. ☐
7. Which one of the following parts of the eye gives the most accurate interpretation of an image  
A. Blind spot  
B. Retina  
C. Fovea  
D. Lens ☐
8. The hormone that controls the amount of water re – absorbed into the blood stream by the kidney is known as  
A. Adrenaline  
B. Vasopressin  
C. Insulin  
D. Thyroxin ☐
9. Which of the following lacks locomotory structures  
A. Amoeba  
B. Euglena  
C. Paramecium  
D. Plasmodium ☐
10. Plant roots in association with symbiotic bacteria is an indication that;  
A. The plant is un healthy  
B. The soil around lacks Nitrogen  
C. The soil around the roots lacks water  
D. The roots have a viral infection ☐
11. The significance of vascularization of endometrium before implantation in mammals is to;  
A. Ensure firm attachment of the feotus on to the uterine wall.  
B. Prevent menstruation  
C. Assist in producing hormones which maintain pregnancy  
D. Facilitates food and oxygen supply to the feotus and removal of excretory products ☐
12. The main function of the epididymis of the mammalian testis is to  
A. Store spermatozoa  
B. Produce spermatozoa  
C. Secrete seminal fluids  
D. Secrete hormones ☐

13. Two organisms A and B live together in the same locality A provide shelter to B where as B feeds on some secretions produced by A. What type of relationship are two exhibiting

- A. Parasitism
- B. Saprophytism
- C. Commensalism
- D. Mutualism

14. The correct route taken by a molecule of carbon dioxide exhaled from the body is

- A. Alveolus → Bronchus → Bronchiole → Trachea → Nostril
- B. Nostril → Trachea → Bronchus → Bronchiole → Alveolus
- C. Alveolus → Bronchiole → Bronchus → Trachea → Nostril
- D. Trachea → Bronchus → Bronchiole → Nostril → Alveolus

15. Asexual reproduction in spirogyra takes place by

- A. Fragmentation
- B. Sporulation
- C. Conjugation
- D. Binary fission

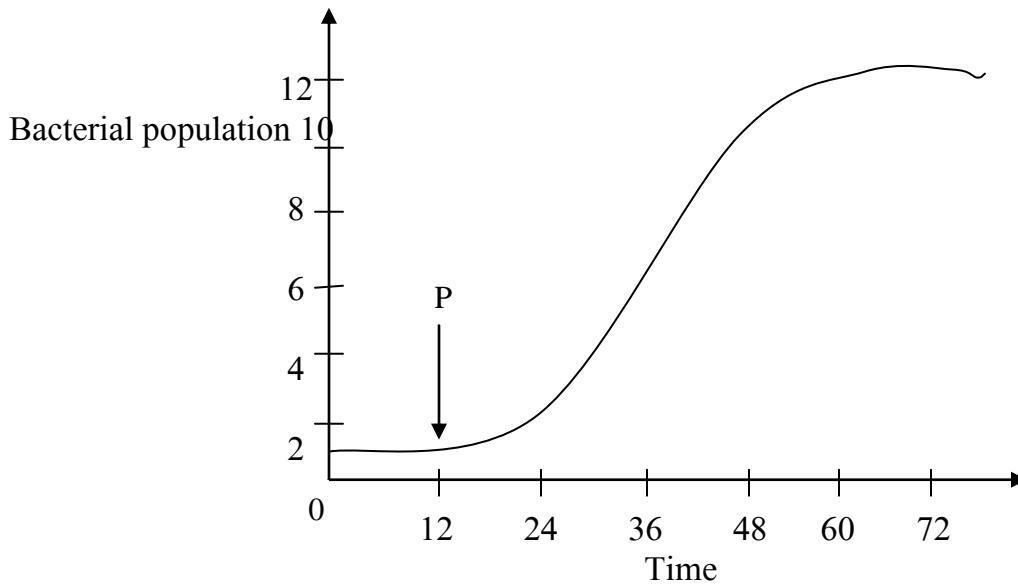
16. Sickle cell is a disease that affects the red blood cells of human beings. What would be the percentage number of off springs with sickle cells if two other carrier parents get married?

- A. 100%
- B. 75%
- C. 50%
- D. 25%

17. Which one of the following vitamins and mineral elements are essential for clot formation

- A. Vitamin A and iron
- B. Vitamin C and potassium
- C. Vitamin K and calcium
- D. Vitamin E and nitrogen

18. Curve 1 below shows the population growth of bacterial cells over a given time: What is taking place in region P?



- A. Exponential grow due lack of food
- B. Slow growth due to plenty of food
- C. Slow growth due to lack of reproductive individuals
- D. Slow movement

☐

19. Which one of the following measures can be applied to reduce on the rate of air pollution by carbon dioxide in Uganda?

- A. By reducing on the quantity of fuel consumption and by industries and automobiles
- B. By constructing long chimney to direct industrial gases far into the atmosphere.
- C. By planting many trees to consume high levels of carbon dioxide from the atmosphere.
- D. By directing the gas into water bodies

☐

20. Which one of the following Arthropods possesses poisonous claws on their limbs?

- A. centipedes
- B. Millipedes
- C. Cockroaches
- D. Mosquitoes

☐

21. In which one of the following regions of the leaf is the highest concentration of chloroplast cells
- A. Palisade mesophyll region
  - B. Spongy mesophyll region
  - C. Lower epidermal region
  - D. Intercellular air space regions
22. In which part of the nephron does reabsorption of glucose take place?
- A. Bowman's capsule
  - B. Loop of Henle
  - C. Glomerulus
  - D. Proximal convoluted tubule
23. Which one of the following adjustments occurs in the body in the response to over heating?
- A. Skeletal muscle contraction
  - B. Reduction in metabolic rate
  - C. Closure of sweat pores
  - D. Vasoconstriction of arteries
24. Which one of the following is the correct order of arrangement of ossicles in the middle ear?
- A. Malleus, incus, stapes
  - B. Incus, stapes, Malleus
  - C. Malleus, stapes, incus
  - D. Incus, Malleus, stapes
25. During what phase of mitosis do the chromosomes align themselves at the equator of the spindle.
- A. Inter phase
  - B. Prophase
  - C. Metaphase
  - D. Anaphase
26. Large trees are capable of losing liquid water via their leaves by the process of
- A. translocation
  - B. Transpiration
  - C. Photosynthesis
  - D. Guttation
27. Which one of the fins is responsible for controlling pitching during locomotion in fish?
- A. Caudal and anal fins

- B. Pectoral and anal fins
- C. Dorsal and pelvic fins
- D. Pelvic and pectoral fins

☐

28. The following are characteristics of the coordination processes in a mammal.

- (i) Messages travel very fast
- (ii) Effects of messages usually last longer
- (iii) Messages are transmitted through the blood stream
- (iv) Made of secretory cells
- (v) Messages are transmitted in form of electrical impulse.

Which one represents hormonal coordination ?

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

☐

29. A student took a blood sample from the cut tail of a rat and placed it in a dilute salt solution. He later observed that majority of the red blood cells had lost their bi concave disk shape and had burst. He described the bursting as

- A. Flaccidity
- B. Plasmolysis
- C. Haemolysis
- D. Turgidity

☐

30. The three areas of gaseous exchange in frogs are.

- A. Lungs, bucal cavity and stomach
- B. Skin, lungs and nostril
- C. Skin, lungs and bucal cavity
- D. Lungs, nostrils and wind pipe

☐

## SECTION B (40MARKS)

- 31 In an experiment, the time taken for enzyme catalase to produce  $10\text{cm}^3$  of oxygen in seconds was recorded at various temperatures in  $^{\circ}\text{C}$ . The results were as follows.

Temperature ( $^{\circ}\text{C}$ )	Time(t) taken to evolve $10\text{cm}^3$ of oxygen (seconds)	Rate $1/t$
15	40	
25	33	
35	25	
45	20	
55	40	
65	125	
75	No gas evolved.	

- a) Complete the table by calculating the rate of oxygen released at each temperature. (3½marks)
- b) Plot an appropriate graph for the data in the table above (7½marks)
- c) i) Describe the shape of the graph (2½marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....



ii) Explain the shape of the graph

(3½marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

d) Explain why enzymes pepsin cannot function outside the stomach in the alimentary canal.

(2marks)

.....

.....

.....

.....

.....

.....

e) Apart from the factors seen above, name three other factors which affect enzyme activity.

(1½marks)

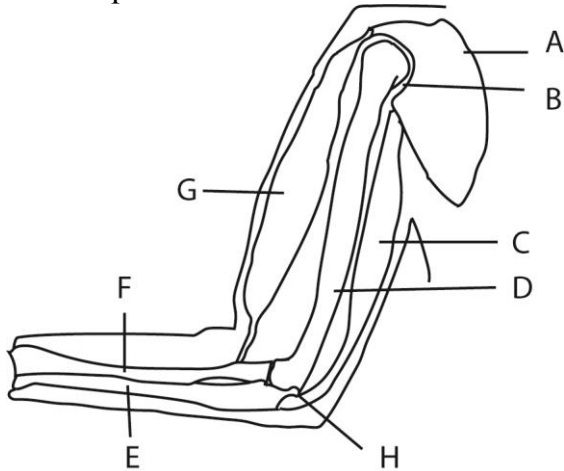
.....

.....

.....

.....

- 32 Study the diagram of the part of the fore arm below and answer the questions that follow.



4

- a) Label the parts labeled A-H on the diagram above (4marks)

.....

.....

.....

.....

.....

.....

- b) i) How does the structures B and H differ in the way they bring about movement? (2 marks)

.....

.....

.....

.....

.....

- c) Explain how bending and straightening of the arm occurs at point H (3marks)

.....

.....

.....

.....

(d) Give two functions of part labelled D (02marks)

.....

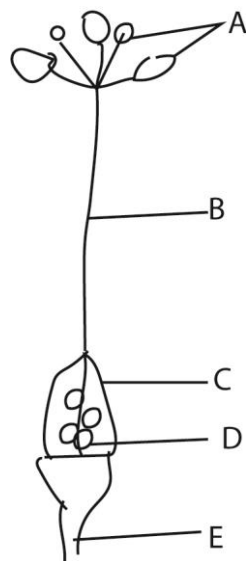
.....

.....

.....

33 The drawing is part of a common plants flower

(a) Name parts



(b) i) Identify the structure drawn above

(1mark)

.....

.....

.....

ii) Name one **essential** part of the flower not shown in the diagram.  
(1mark)

.....

.....

.....

(c) What is the importance of part C and D? (2marks)

.....

.....

.....

(d) In what ways do the following adaptations promote flight in birds?  
(5marks)

(i) Rigid skeleton.

.....

.....

.....

(ii) Hollow bones

.....

.....

.....

(iii) Large keel

.....

.....

.....

(iv) High metabolic rate

.....  
.....  
.....  
(v) Stream lined body.  
.....  
.....  
.....

### SECTION C (30marks)

34. (a) A bare footed man suddenly steps on a drawing pin and quickly jumps up.

With the aid of a diagram describe the response. (10marks)

b) Distinguish between the nervous and hormonal control. (5marks)

35 Explain how;

a) Deforestation may harm the environment (7marks)

b) Trees may conserve soil. (08marks)

36. a) Distinguish clearly between complete dominance and co dominance.

(03marks)

b) Explain how a man with blood group A and a woman with blood group B, can have a child with blood group O. Show your working.

(6<sup>1</sup>/<sub>2</sub>marks)

c) The presence of hair on the stems of a certain species of plant is controlled by a single pair of alleles. When a pure breeding plant with a smooth stem, all the off springs have hairy stems. Using a genetic cross, show how parental plants can produce off springs with hairy and smooth stems in the ratio of 1:1

(4<sup>1</sup>/<sub>2</sub>marks)

37 a) Define the following terms.

i) Ultra filtration (1<sup>1</sup>/<sub>2</sub>marks)

- ii) Selective reabsorption *(1½marks)*
- b) Describe what happens along the following areas of nephron during the urine formation in man.
- i) Proximal convoluted tubule. *(4marks)*
  - ii) Distal convoluted tubule *(3marks)*
  - iii) Collecting duct. *(3marks)*
- c) State two ways by which plants excrete their metabolic wastes products. *(2marks)*

***END***