

NAME..... INDEX NO.....

231/1  
BIOLOGY  
PAPER 1  
(THEORY)  
TIME: 2 HOURS

CANDIDATE'S SIGN.....

DATE.....



# Atika School

F r e e O n l i n e A c a d e m y

**INSTRUCTIONS TO CANDIDATES:**

1. Write your **Name**, **Index Number** and **School** in the spaces provided above.
2. **Sign** and write the **date** of examination in the spaces provided above.
3. Answer **all** the questions in the spaces provided.
4. Answers must be written in the spaces provided in the question paper.
5. Additional pages **must not** be inserted.

**FOR EXAMINER'S USE ONLY:**

Question	Maximum Score	Candidate's Score
1 - 22	80	

1. State one use for each of the following apparatus in the study of living organisms. (1mk)
- (a) Pooter. (1mk)
- 
- 
- 
- (b) Pitfall. (1mk)
- 
- 
- 
2. What name is given to the process that involves the following activities that take place in the nephron of a human kidney?
- (a) Removal of nitrogenous waste from the blood. (1mk)
- 
- (b) Return of useful substances back to the blood. (1mk)
- 
3. State **two** functions of bile juice in digestion of fats. (2mks)
- 
- 
- 
4. (a) Name a disease of the liver whose symptom is hardening and swelling of the liver. (1mk)
- 
- (b) State the causative agent of the following diseases.
- (i) Typhoid. (1mk)
- 
- (ii) Amoebic dysentery. (1mk)
- 
5. State what would happen in each of the following:
- (a) If a plant cell is placed in:
- (i) A strong salt solution. (1mk)
- 
- 
-

(ii) Distilled water. (1mk)

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(b) If a red blood cell is placed in:

(i) Strong salt solution. (1mk)

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(ii) Distilled water. (1mk)

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6. State how the following factors affect enzyme activity.

(a) Increase in temperature up to the optimum. (1mk)

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(b) Change of PH beyond the optimum range. (1mk)

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(c) Presence of inhibitors. (1mk)

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7. (a) Differentiate between a mutagen and a mutant. (2mks)

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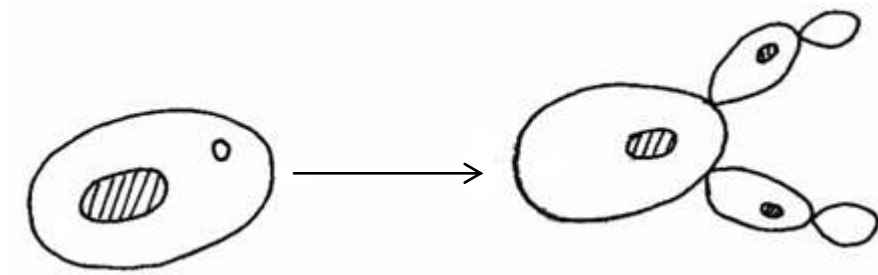
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(b) Name **two** genetic disorders caused by gene mutation. (2mks)

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8. The diagram below shows reproduction occurring in yeast.



(a) Name the type of asexual reproduction shown. (1mk)

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(b) Name an animal that shows this type of reproduction. (1mk)

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9. (a) Name the type of evolution involved in the development of homologous structures. (1mk)

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(b) How do convergent evolution occur? (3mks)

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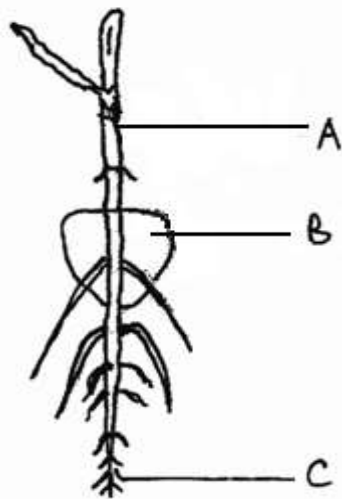
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10. The diagram below represents a maize seedling.



(a) Name the structures labelled **A** and **C**. (2mks)

**A** \_\_\_\_\_

**C** \_\_\_\_\_

(b) State the functions of the parts labelled **A**, **B** and **C**. (3mks)

**A** \_\_\_\_\_

\_\_\_\_\_

**B** \_\_\_\_\_

\_\_\_\_\_

**C** \_\_\_\_\_

\_\_\_\_\_

11. (a) What is oxygen debt? (2mks)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(b) List **two** factors that determine the amount of energy a human being requires in a day. (2mks)

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\_\_\_\_\_

\_\_\_\_\_

12. (a) A group of students visiting a National Park noted that migrations of lions were closely related to those of hyenas and vultures. Suggest a possible cause of this migration. (1mk)

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(b) Explain the observation. (1mk)

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\_\_\_\_\_

\_\_\_\_\_

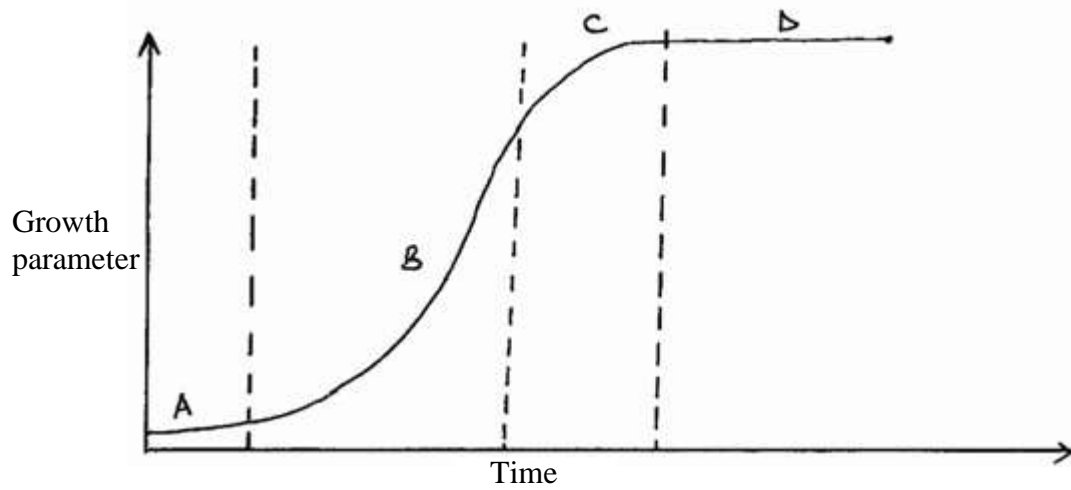
(c) Name **three** methods of estimating population. (3mks)

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\_\_\_\_\_

13. The graph below show the growth curve of an organism.



(a) Name the phase of growth labelled.

(i) **B** \_\_\_\_\_ (1mk)

(ii) **D** \_\_\_\_\_ (1mk)

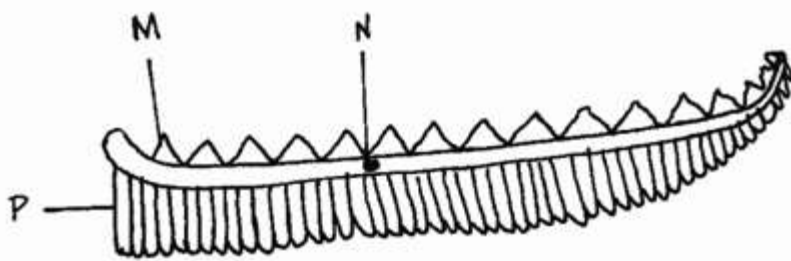
(b) Account for the growth shown in phase A. (1mk)

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14. The diagram below represents an organ from a bony fish. Study the diagram and answer the questions that follow.



(a) Identify the organ. (1mk)

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(b) How are the structures labelled **P** adapted to their functions. (3mks)

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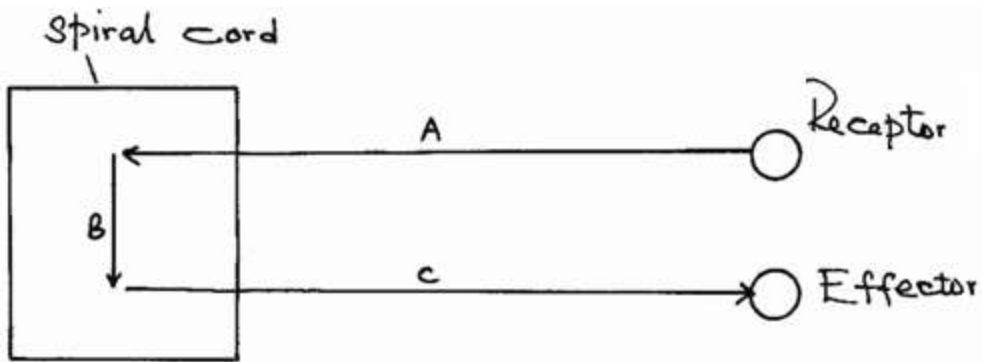
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15. Name the structures that:

(a) Join bones to bones. \_\_\_\_\_ (1mk)

(b) Join muscles to bones. \_\_\_\_\_ (1mk)

16.



The diagram is a simplified part of the nervous system. Use the diagram to answer the following questions.

(a) Name the nerve cells **A** and **C**. (2mks)

**A** \_\_\_\_\_

**C** \_\_\_\_\_

(b) A person with a spinal injury is unable to move part of the body below the injury. Explain. (3mks)

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17. (a) What is double circulatory system? (1mk)

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(b) Name **two** classes of animals which have a double circulatory system. (2mks)

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18. (a) What is seed viability? (1mk)

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(b) List **two** factors that determine seed viability. (2mks)

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19. Two students were observing bacteria using two slides that were duplicates of each other. Student A saw 10 bacteria while student B saw 50 bacteria using identical microscopes.

(a) Suggest a reason why they observed different numbers of bacteria. (1mk)

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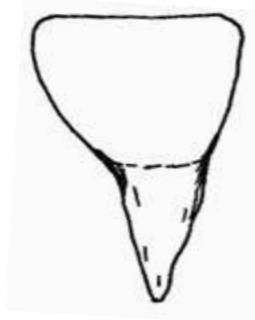
(b) Which of the following combination would give a higher total magnification? (1mk)

Eye piece  $\times$  10      Objective  $\times$  20  
Eye piece  $\times$  10      Objective  $\times$  40

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20. The diagram below shows a human tooth.



(a) Identify the tooth. (1mk)

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(b) How is the tooth adapted to its function? (1mk)

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(c) State the deficiency disease caused by lack of the following vitamins in the human body:

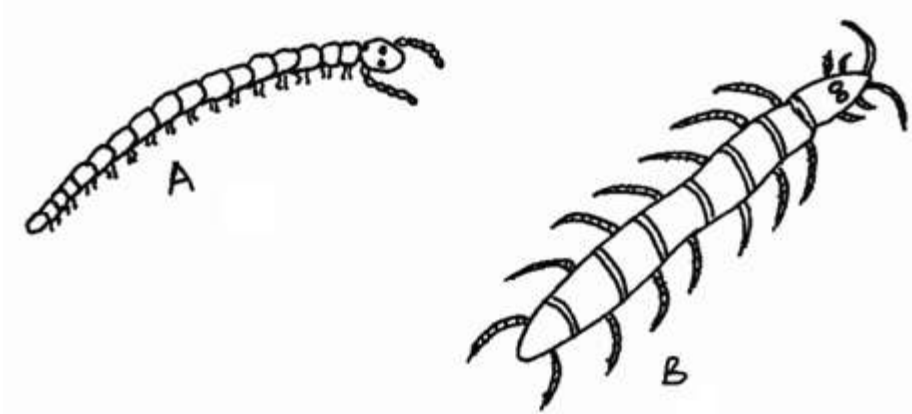
(i) Vitamin A. (1mk)

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(ii) Vitamin D. (1mk)

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21. The figures below show two types of animals.



(a) Identify the phylum of the **two** organisms. (1mk)

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(b) (i) Identify **two** distinguishing characteristics which are used to put the organisms into their different classes. (2mks)

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(ii) Name the classes to which the organisms belong. (2mks)

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22. State **three** features in bisexual flowers that hinder self-fertilization. (3mks)

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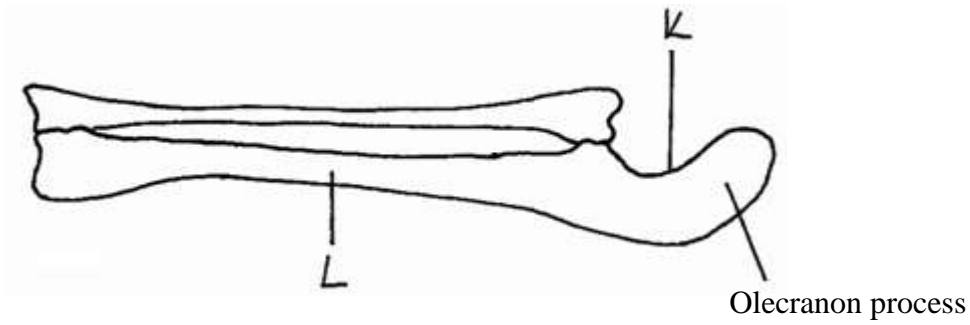
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23. The diagram below shows the bones of the lower arm.



(a) Identify the part labelled **K**. (1mk)

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(b) Name the bone labelled **L**. (1mk)

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(c) What is the function of the olecranon process? (1mk)

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24. (a) Define 'transpiration'. (1mk)

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(b) State **two** structural factors that would favour increase in transpiration rate. (2mks)

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## 231/1 - BIOLOGY PAPER 1 - MARKING SCHEME

- 1.(a) Sucking small insects / small animals from rock surfaces and barks of trees ;  
(b) To trap small crawling animals (e.g. insects, amphibians, reptiles, Arachnida)
- 2.(a) Ultra filtration;  
(b) Selective reabsorption;
3. Emulsification;  
Provides a suitable medium for digestive enzymes;
4. (a) Liver cirrhosis;  
(b)(i) Salmonera typhi;  
(ii) Entamoeba histolytica;
- 5.(a)(i) Loss water by osmosis and become plasmolysed;  
(ii) Gain water by osmosis and become turgid;  
(b)(i) Loss water by osmosis and become crenated;  
(ii) Gain water by osmosis and become haemolysed;
- 6.(a) Increase the rate of enzyme activity ;  
(b) Stops enzyme activity;  
(c) Stops enzymes activity;
- 7.(a) Mutagen - a substance that causes mutation ;  
Mutant - The organism that inherits or exhibits the mutation;  
(b) Sickle - cell anaemia ; Albinism ; Hemophilia ;  
Colour blindness; NB: The 1st two correct ones.
8. (a) Budding  
(b) Hydra
- 9.(a) Detergent evolution.  
(b) Convergent evolution occur when two dissimilar species / structures / organisms of different embryonic origin ; change in response to similar environmental / same environment / similar ecological niche conditions / occupy the same environment ; and develop similar characteristics / modified to perform same function;
- 10.(a) A - Coleoptile ;  
C - Root hair ; rej. Hair root.  
(b) A - Protect the plumule from mechanical damage as it emerges from the ground;  
B - Stores food for the germinating seed;  
C - Absorbs mineral salts and water from the soil;
- 11(a) Oxygen debt is the amount of oxygen required to convert lactic acid into CO<sub>2</sub>, water and energy;  
after anaerobic respiration which takes place during a strenuous or vigorous exercise;  
(b) Basal metabolic rate; sex; occupation / activity; age; body size; NB/ The 1st two correct ones.
- 12(a) Drought;  
(b) Vultures and hyenas depend on flesh and bones; left over by lions; hence closely follow lions to obtain food;
- 13.(a) (i) Exponential phase / phase of accelerated growth ;  
(ii) Stationary phase/plateau phase;

(b) Number of cell dividing are few / cells not yet adjusted to the surrounding environmental factors.

14.(a) Gill ;

(b) Thin walled; to minimise distance between water and blood in capillaries.

Highly vascularised;

Numerous; to increase the surface area for absorption.

Highly folded; increase the surface area for diffusion of gases.

15.(a) Ligaments;

(b) Tendons ;

16.(a) A - Sensory Neurone.

C - Motor Neurone.

(b) Impulse from brain; blocked at injury where intermediate neurones are destroyed; impulse does not reach the effector muscle.

17.(a) Double circulatory system: This is the type of circulatory system in which the blood passes through the heart twice in one complete circuit of blood flow;

(b) Mammalia;

Ave;

18.(a) Viability - ability of the seed to germinate;

(b) Maturity of the embryo;

Health status of the seed;

Enzyme status of the seed;

Presence of germination inhibitors.

1st two correct ones.

19.(a) The first student who saw 10 bacteria was using a higher total magnification while the second student who saw 50 bacteria was using a lower total magnification.

(b) The eye piece x 10 objective lens x 40  
= x 400

20.(a) Incisor tooth;

(b) Chisel shaped for cutting food;

(i) Night blindness;

(ii) Rickets;

21(a) Arthropoda ;

(b)(i) Number of legs per segment;

Presence of poison claws.

(ii) A - Diplopoda.

B – Chilopoda

22. Non compatibility / incompatibility / male gametes unable to fertilize female gametes of the same flower;

Male parts maturing earlier than female parts / protandry.

Female parts maturing earlier than male parts / protogyny.

23.(a) Sigmoid notch ;

(b) Ulna;

(c) Offers a larger surface area for the attachment of the muscles of the arm.