

Name: Marking Scheme AdmNo: Stream: T1C



ALLIANCE HIGH SCHOOL
TRIALS

BIOLOGY: 231/1
AUG. 2022
TIME: 2 HOURS

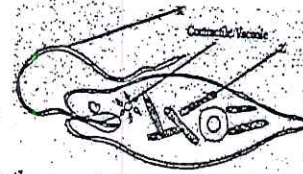
Instructions to candidates

- Write your Name, Index, Admission number and stream in the spaces provided above.
- Sign and write the examination date on the spaces provided above.
- Answer all questions in the spaces provided in the question paper.
- Additional pages must NOT be inserted.
- Candidates should check the question paper to ascertain that all 8 pages are printed as indicated and that no questions are missing.
- Candidates must answer the questions in English.

FOR EXAMINER'S USE ONLY

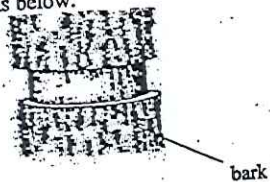
Question	Maximum Score	Candidate's Score
1-22	80	

1. The diagram below represents an organism. Study it and answer the questions that follow.



- Identify the kingdom to which the organism belongs (1 mark)
Protista / Plantae First letter must be capital letter
- Name the structures labelled X (1 mark)
Flagellum; rej. flagella.
- Identify the type of nutrition carried out by the organism and give a reason (2 marks)
Type of Nutrition: Autotrophic; Reason: presence of chloroplasts.
- State the phylum where all members have open circulatory system. (1 mark)
Arthropoda Rej. Inthropoda, arthropoda.
 - State advantages of closed circulatory system over open circulatory system. (2 marks)
Blood circulates over larger distance at a faster rate due to high pressure; Animals tend to be more active due to efficient transport of gases; Oxygenated and deoxygenated blood do not mix.
- Explain why malaria cannot be transmitted through blood transfusion. (2 marks)
It is a vector disease; parasite are transmitted from an infected individual to a healthy one through bite of female Anopheles mosquito.
- A boy held a locust upside down and attempted to drown it, by immersing the head in water. Explain the observation made. (2 marks)
The locust did not drown; Spiracles used for gaseous exchange are located on the abdomen and thorax, no spiracles on the head.
- Explain why malaria cannot be transmitted through blood transfusion. (2 marks)
Plasmodium has undergone mutation / mutates and develops resistance due to prolonged use of Quinine.

6. The diagram below shows an experiment that was carried out to investigate a certain biological process. Study it and answer the questions below.



(1 mark)

a) What is the aim of the experiment?

To investigate translocation of food substances;

(1 mark)

b) Name the tissue removed in the above experiment?

phloem.

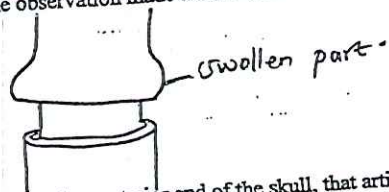
(2 marks)

c) State how the above-named tissue is structurally adapted to its function?

Has sieve pores to allow free movement of materials from one sieve to another;
Have companion cells with numerous mitochondria to supply energy for active transport - cytoplasmic filaments which allow bidirectional movement of materials

(1 mark)

d) Draw a diagram to illustrate the observation made after 3 weeks?



7. (a) Name the protrusions found on the posterior end of the skull, that articulate to the atlas.

Occipital condyles;

(1 mark)

(b) Give the name of the joint formed in (a) above, and state its functions.

Joint: Hinge joint;

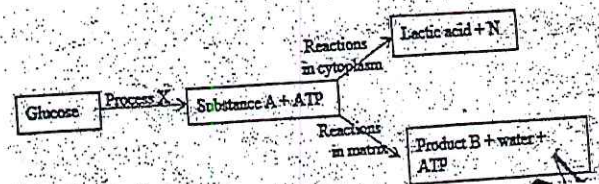
(2 marks)

Function: Nodding of the head.

8. Explain natural selection using principles considered by Charles Darwin. (4 marks)

Variation exists between individuals of same species; due to environmental pressure population struggles for existence; organisms with favourable adaptive features survive the pressures (survival to the fittest); upon maturity they reproduce and the favourable traits are passed to offspring leading to existence of new species;

9. The chart below shows a summarized process that occurs in animals.



(3 marks)

a) Name the following:

(i) Process X

Glycolysis;

(ii) Substance A

Pyruvic acid / pyruvate;

(iii) Product B

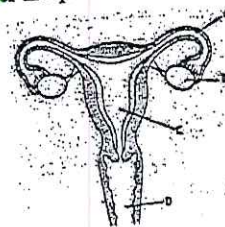
Carbon (IV) oxide;

(1 mark)

(b) State the condition necessary for the reactions in matrix to occur.

Oxygen gas.

10. Study the diagram below and answer the questions that follows



(3 marks)

a. Identify the parts labelled B, C and D.

B. Ovary;

C. Uterus;

D. Vagina;

(2 marks)

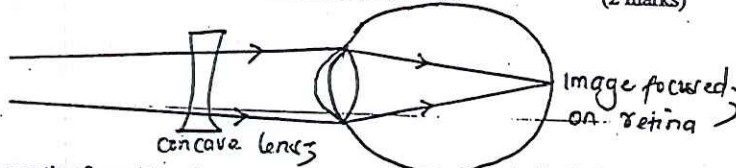
b. State the adaptation of part A to function.

- Has cilia to propel the ovum towards the uterus;
- Has smooth muscles which contract to enable movement of ovum to uterus for implantation;
- Long to increase surface area for fertilization;

11. The diagram below shows the position of an image formed in a defective eye.



- (a) Name the defect (1 mark)
Myopia
- (b) State how the defect named in (a) above can be corrected. (1 mark)
Wearing concave or diverging lens.
- (c) Draw a sketch, to demonstrate how the above condition is corrected. (2 marks)

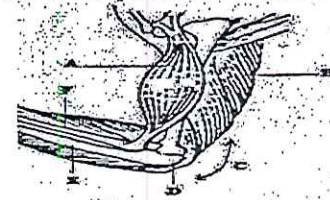


12. Three stems of *Tradescantia* of equal length were placed in three solutions of different concentrations. The set ups were left to stand for 30 minutes. The results were recorded in the table below.

Solution	Initial length of stem (mm)	Final length of stem (mm)
A	37	37
B	37	36.7
C	37	38

- a) Identify the nature of solution A. (1 mark)
Isotonic solution
- b) Account for the observation made in solution B. (2 marks)
Solution B was hypertonic to cell sap of Tradescantia; cells lose water to solution B by osmosis; became plasmolyzed hence reduced in length.
- c) Apart from the length name any other observation made on the stem in solution C. (1 mark)
Stem was rigid/firm.

13. Study the diagram below and answer the questions which follow.



- a) Identify the muscle represented by letters A and B (1 mark)
Biceps and triceps muscles.
- (b) Name the joint C (1 mark)
Hinge joint
- (c) Name parts label D, E and F (3 marks)
 D. Olecranon process
 E. Ulna
 F. Radius

14. State the effects of over secretion of thyroxine hormone. (3 marks)
Increased Metabolism; Increased heart beat; Mental restlessness/irritability; Enlarged thyroid gland.
15. Differentiate between simple reflex and conditioned reflex action. (3 marks)

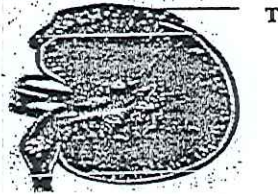
Simple Reflex	Conditioned Reflex
- Independent on experience.	- Dependent on experience.
- Same sensory and motor neuron.	- Sensory neuron is replaced but motor remains unchanged.
- Single stimulus evokes response.	- Both substitute and original reflex evoke response.
- Automatic (innate).	- It is learned.

16. Describe the mechanism of closing the stomata on the basis of photosynthetic theory (4 marks)
At night, no photosynthesis occurs; Glucose converts to starch and osmotic pressure reduces i.e. lowered; Guard cell loses water by osmosis; becomes flaccid and stomata closes.

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17. An investigation was carried out on a mammalian kidney.



a) Name the gland labeled T. (1 mark)

Adrenal gland;

b) What is the function of the structure named in (a) above in the kidney. (1 mark)

Secretes aldosterone hormone for reabsorption of Na⁺ in kidney

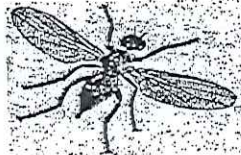
c) Identify the disease shown in the kidney above. (1 mark)

Kidney stones;

d) Giving examples, state ways in which biological nitrogen fixation is carried out. (2 marks)

- Symbiotic Nitrogen fixation e.g. Rhizobium spp and leguminous plants
- fixation by free living bacteria e.g. Azotobacter, Clostridium etc.

18. The diagram below represents a certain organism collected by a student at the sea shore



a. Name the class to which the organism belongs. (1 mark)

Insecta.

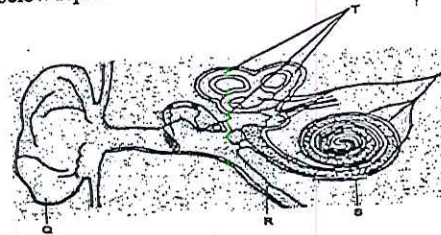
b. State the observable features that enables the above organism adapt to its habitat. (2 marks)

- Has wings to fly and colonize new habitats;
- presence of exoskeleton to support insect above ground.
- presence of legs to search for food, escape unfavorable condition

19. What is the importance of seed dispersal? (3 marks)

- Plants inhabit new habitats;
- prevents overcrowding;
- Avoids competition for nutrients light etc

20. The diagram below represents a section through the mammalian ear.



a) Name the structures labelled R and T. (2 marks)

R. Eustachian tube;

T. Semi circular canal;

b) State how the structures S is adapted to its functions. (2 marks)

1. Its fluid filled contains perilymph and endolymph which conduct sound vibrations from oval window to sensory cells
2. Has sensory cells that are stimulated by vibrations to produce nerve impulses.

c. state the functions of structures Q and T (2 marks)

Q. Collect and concentrates sound waves into external auditory meatus
T. Maintain body balance and posture.

21. State three aspects of growth that can be estimated in living organisms. (3 marks)

- Cell division;
- Cell expansion, except cell enlargement;
- Cell differentiation;

22. (a) Define the Incomplete metamorphosis. (1 mark)

Development in some insects involving egg, nymph and adult.

(b) State one function of each of the following hormones (2 marks)

(i) Juvenile hormone.

Formation of larval cuticle; Retention of juvenile characteristics

(ii) Ecdysone.

Mouling in insects;