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231/1

**BIOLOGY**

**(THEORY)**

**Paper 1**

**MAY/JUNE 2016**

Time: 2 Hours

**ALLIANCE HIGH SCHOOL**  
**PRE-TRIAL BIOLOGY PAPER I**

**INSTRUCTIONS TO CANDIDATES**

Answer all the questions in the space provided.

Additional pages **MUST** not be inserted.

Candidates may be penalized for false information and even wrong technical terms.

**FOR EXAMINER'S USE ONLY**

QUESTION	MAXIMUM SCORE	CANDIDATE SCORE
1 – 30	80	

*This paper consists of 13 printed pages.*

*Candidates should check to ensure that all pages are printed as indicated and no questions are missing*

1. Name the causative organism of:

i) Amoeba dysentery \_\_\_\_\_ (1mk)

ii) Tuberculosis \_\_\_\_\_ (1mk)

2. If two drops of 0.1% Ascorbic acid decolorizes 2ml of DCPIP, calculate the concentration of ascorbic acid in a fruit juice that requires 8 drops to decolorize 2ml of DCPIP. (2mks)

3. Explain why plants do not require specialized excretory organs. (2mks)

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\_\_\_\_\_

\_\_\_\_\_

4. State the function(s) of Brunner's gland in mammalian alimentary canal. (1mk)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. Describe any three adaptations of halophytes. (3mks)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. In an experiment, the concentration of ions in the cell sap of reeds growing in a swampy area and the water in the swamp were determined. The data below was obtained when the water temperature was 18°C. Study it and answer the questions that follow:

Sample	Na <sup>+</sup>	Mg <sup>2+</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>
Cell sap	50	11	101	13
Swamp water	1.2	30	10.2	0.67

a) Name the process by which uptake of the following ions by the reeds occurs. (2mks)

Cl<sup>-</sup> ions

Mg<sup>2+</sup> ions

b) What effect would increased temperature to 28°C have on the uptake of sodium ions? Explain your answer. (2mks)

7. Explain how age determines energy requirements in humans. (1mk)

8. a) Differentiate between pyramid of number and pyramid of biomass. (1mk)

b) Explain the shape of the common pyramid of numbers. (1mk)

9. Auxins are growth substance.

- a) Name the site of its production. (1mk)
- b) State two practical applications of Gibberellins (2 mks)

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10. a) Chlamydomonas moves in the direction of optimum light intensity.

i) Name the response fully. (1 mk)

ii) What is the significance of the response named in (i) above? (1 mk)

b) Explain the response of a housefly maggot to the same stimulus? (1 mk)

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11. What is meant by the following terms? (2mks)

i) Epigynous flower.

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ii) Staminate flower.

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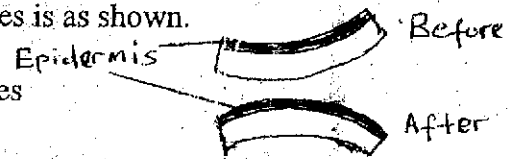
12. How are the male parts of a wind pollinated flowers adapted to their functions? (2mks)

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13. A freshly obtained *tradescantia* stem measuring 5 cm long was split lengthwise half way through. One piece was placed in a solution of a certain concentrations in a Petri dishe for 20 minutes. The appearance before and after 20 minutes is as shown.



a) Account for the appearance of the piece after the 20 minutes

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(3 mks)

b) What would become of a red blood cell if placed in the solution for 20 minutes? (1mk)

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14. State the function of each of the following during gaseous exchange in insects: (2mks)

a) Rings of cuticle lining the tracheae

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b) Fluid in the fine tracheoles.

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15. a) Explain why urine of a healthy person lacks the following: (2mks)

i) Glucose

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ii) Fibrinogen.

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b) Urine sample from a sick person was found to contain some proteins.

i) Identify the disease the person was suffering from.

(1mks)

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ii) What causes the disease named in b(i) above?

(1mk)

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16. The graph below shows oxygen uptake during and after a period of exercise.



a) Region A represents the amount of oxygen needed in the body but is not supplied through breathing. How does the body compensate for this deficit?

(2mks)

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b) Briefly explain why it is not advisable for people to ascend a very high mountain in one day. (3mks)

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17. State ways in which carbon (IV) oxide is transported from the tissues to the lungs.(3mks)

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18. State the biological importance of tropisms. (3mks)

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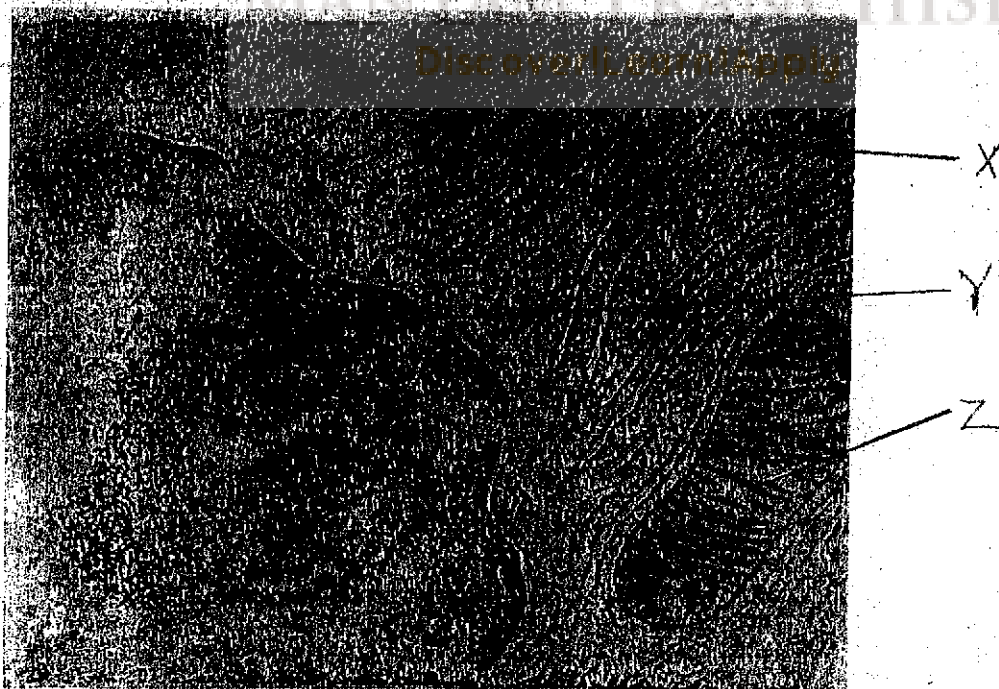
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19. The diagram below is an electron micrograph part of an animal cell.





i) Name the parts labeled: (2mks)

X

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Y

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ii) State the function of Z. (1mk)

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20. What is phyllotaxis as used in classification? (1mk)

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21. a) What are analogous structures? (1mk)

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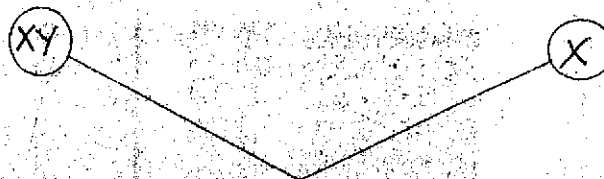
b) Name the type of evolution is supported by homologous structures? (1mk)

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22. The following diagram shows fusion of a normal female gamete with a male gamete that has an extra sex chromosome.

Gamete in male

Normal gamete in female



XXY Male.

a) Name the type of mutation that led to formation of the abnormal male gamete. (1mk)

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b) What name is given to the males with genotype XXY? (1mk)

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23. Give two differences between epigeal and hypogeal germination. (2mks)

Epigeal	Hypogeal

24. A person of blood group B requires a blood transfusion. State the blood group(s) of the would be donors and give a brief explanation why the stated blood group(s) would be the most appropriate

\_\_\_\_\_ (2mks)

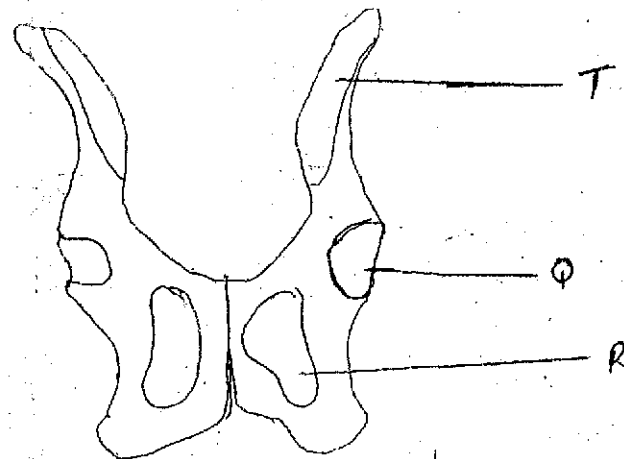
25. The diagram below represents the apical growth in a root of a dicotyledonous plant.



- a) What happens to the cells at zone B? (1mk)

- b) Name a growth substance that is produced at Zone A that brings about change in zone B (1mk)

26. A bone obtained from a certain mammal is represented by the diagram below.



a) i) Identify the bone. \_\_\_\_\_ (1 mk)

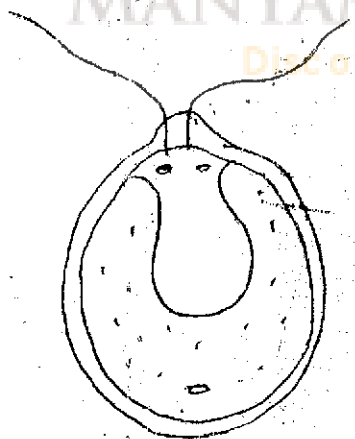
ii) Name the parts labeled:- (2 mks)

T \_\_\_\_\_

R \_\_\_\_\_

b) What structure articulates with part Q? \_\_\_\_\_ (1 mk)

27. The figure below shows an organism a student observed from a drop of pond water by use of a microscope.



a) To which kingdom does the organism belong? \_\_\_\_\_ (1mk)

b) Using an evidence from the diagram, suggest:

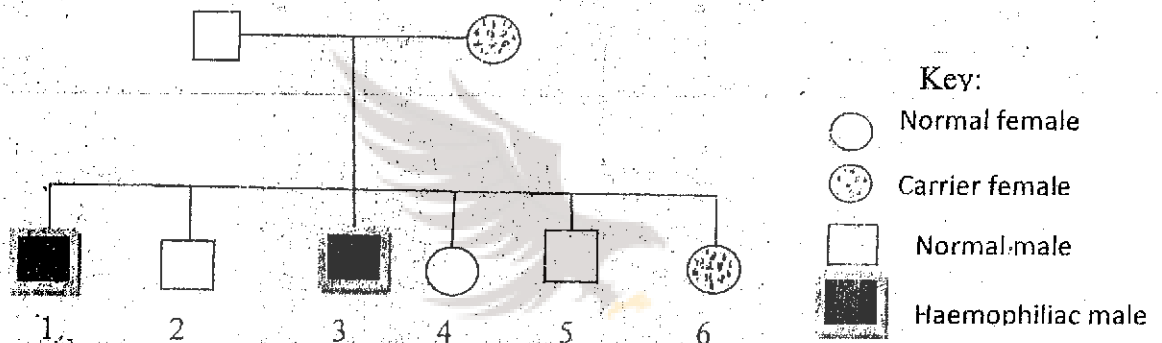
i) The mode of nutrition for this organism.

(1mk)

ii) The mode of locomotion.

(1mk)

28. Study the genetic chart below showing the inheritance of the gene responsible for haemophilia in a family.



a) Write the genotypes of the individuals: (3mks)

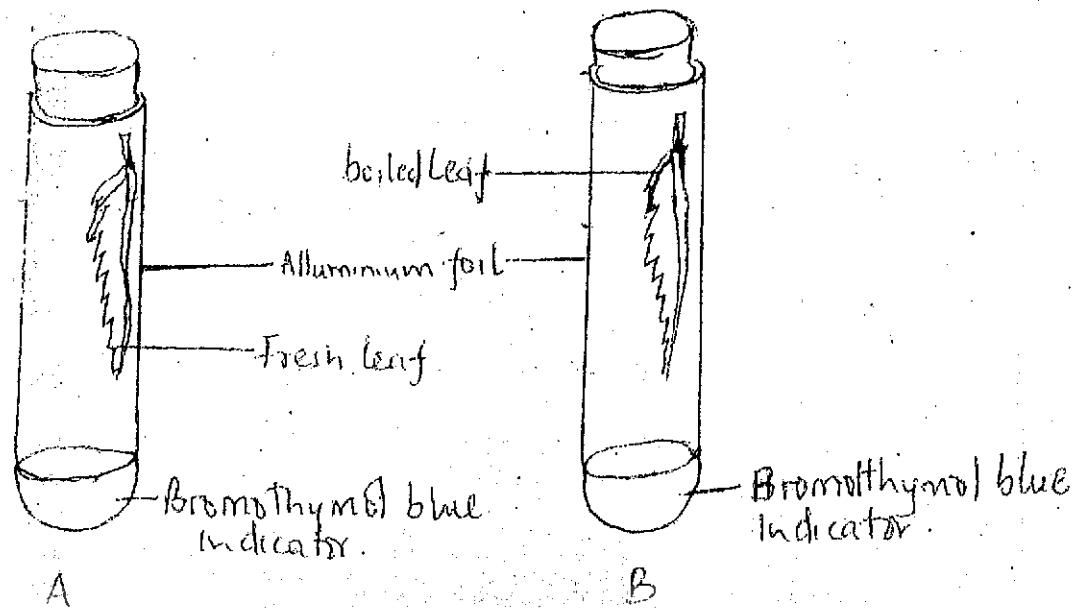
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b) If the family member numbered 3 married a homozygous normal woman, what is the probability of then getting a haemophiliac son? (1mk)

29. In an experiment the following set up was prepared in the lab.



Freshly picked leaf of Bougainvillea was suspended in a boiling tube A that was covered with aluminum foil. The mouth of the boiling tube is covered as shown. The same procedure is repeated using a boiled leaf of the same species and set as test tube B.

a) State the expected observations after 5 hours. (2mks)

A \_\_\_\_\_

B \_\_\_\_\_

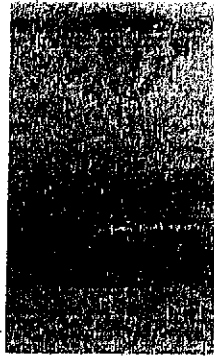
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b) Account for the observation in a i) above. (2mks)

A \_\_\_\_\_

B \_\_\_\_\_

30. Study the diagram below.

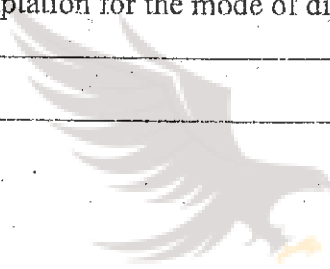


Fruit Q

- a) Identify fruit Q \_\_\_\_\_ ( 1 mk)
- b) i) What is the mode of dispersal for fruit Q? \_\_\_\_\_ ( 1 mk)
- ii) State one visible adaptation for the mode of dispersal named in b(i) above. ( 1 mk)

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