

1. This paper consists of sections A, B, C and D. **Answer FIVE (5) questions including at least ONE (1) question from each section.**

2. **Write your examination number on every page of your answer booklet provided.**

3. **Except for diagrams, which must be drawn in pencil, all writing must be in blue or black ink ball point pen.**

4. **Read each question carefully before you start answering it.**

5. **Each question carries 20 marks.**

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SECTION A

1. (a) Outline the main ideas of the cell theory.
(b) With the help of a well-labelled diagram of a rod-shaped bacterium, describe the structure of a prokaryotic cell.
2. (a) What are proteins?
(b) Discuss the importance of proteins in the structure and metabolism of organisms.

SECTION B

3. (a) One of the current systems of classification which have been recommended for scientific purposes recognises five kingdoms. Name the five kingdoms and describe the **distinctive** characteristics of each kingdom.
(b) Outline the distinguishing features of the phyla to which the following organisms belong: plasmodium, wheat and hookworm.
4. With the aid of a well-labelled diagram describe the structure of a mature maize plant.

SECTION C

5. Discuss the biological importance of water to plants.
6. (a) Describe the uptake and movement of mineral ions across roots.
(b) Describe the circulatory systems found in non-vertebrates and vertebrates.
7. In a certain bacterial culture grown in a closed flask with supplies introduced once, that is, at the beginning of the experiment; the following observations were made through monitoring the population growth.

Growth of the bacterial population from a single cell with the generation time of 30 minutes.

Elapsed time (hours)	Cell number
0.0	1
0.5	2
1.0	4
1.5	8
2.0	16
2.5	32
3.0	64
3.5	128
4.0	130
4.5	132
5.0	133

- (a) Make a graphical representation of the data given above.
- (b) Describe and account for the pattern of the curve observed.
- (c) What would you expect to observe in case the experiment was allowed to continue for 40 hours?

- (d) Discuss the factors which would contribute to the expected observations in (c) above.

SECTION D

8. (a) Describe the disorders given below and show clearly their modes of inheritance.
- (i) haemophilia
 - (ii) albinism
- (b) Outline the observations and deductions made by Charles Darwin and Wallace which led to their hypothesis or theory of evolution.
9. As a member of the school biology club, you have been requested to conduct a lesson to form four students on conservation of natural resources. Discuss the points you would present to explain the:
- (a) meaning of conservation
 - (b) importance of conserving the following natural resources: wildlife, water and forests.