



### 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.