

*Live*  
**Biology**  
NEW SYLLABUS

**Memo Max**  
MEMORY  
MAXIMIZING  
PROGRAM  
  
We offer premium  
learning experience

**English Medium**



**UNIT**  
**01**


**Introduction to Biology**

Importance of Biology

**SAMPATH**  
**LANKADHEERA**

B.Sc. (Hons), M.Sc.

MEMORY MAXIMIZING PROGRAM



Live Biology

# Biology

New Syllabus

**SAMPATH LANKADHEERA**

Unit  
**01** Introduction to Biology  
Importance of Biology

ADVANCED LEVEL

# Biology

Unit - 01

## Introduction to Biology

- o Importance of Biology

Print 2024 May

**© SAMPATH LANKADHEERA**



<https://advanceonlineclass.com>

 sampath lankadheera

 0777 211 384  
0779 925 362




Join Your Class  
Discord Sever

Published by



59/4 Muruthalawa Rd.  
Gannoruwa

 [www.facebook.com/samathlankadheera](https://www.facebook.com/samathlankadheera)

 [www.youtube.com/c/Sampathlankadheera](https://www.youtube.com/c/Sampathlankadheera)

ADVANCED LEVEL

# Biology

**THEORY**

in English Medium

**New Syllabus**



Unit  
**01**

**Introduction to Biology**

○ Importance of Biology

---

**Smart Note**

---

**SAMPATH LANKADHEERA**

B.Sc. Hons. M.Sc. (Biotechnology)

We offer premium learning experience

**Nature scope and importance of biology with reference to challenges faced by the mankind**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

1. **Zoology (the study of animals)**
  2. **Botany (study of plants)**
  3. **Microbiology (study of microorganisms)**
- **Some areas of study in these branches:**



.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

## Introduction to Biology

### Issues Pertaining to Biology

#### 1. Understanding biological Diversity

.....

.....

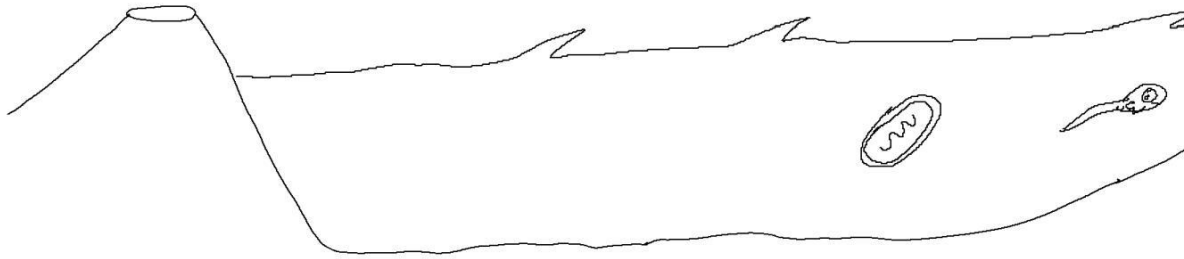
.....

.....

.....

.....







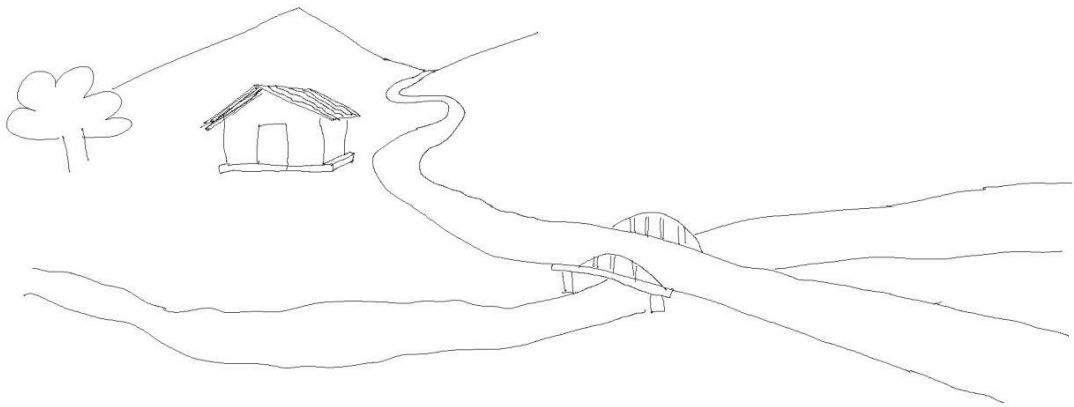
2. Understanding the human Body and its functions

3. Sustainable use and Management of natural resources and Environment





- It causes threat of depletion of natural resources.
- Due to over exploitation of natural resources, various environmental problems arise such as;
  1. Environmental pollution
  2. Loss of Biodiversity
- 3. Desertification
- Hence to overcome the above problems management of natural resources and Environment should be practiced. Knowledge of Biology is useful to bring about remedies for the above problems.



#### 4. Sustainable Food production

.....

.....

.....

.....

.....

.....

.....

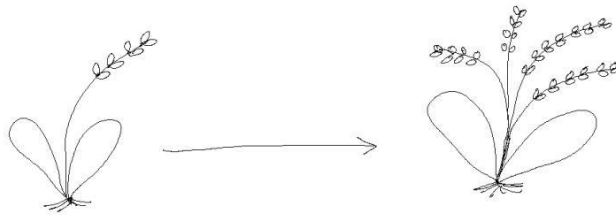
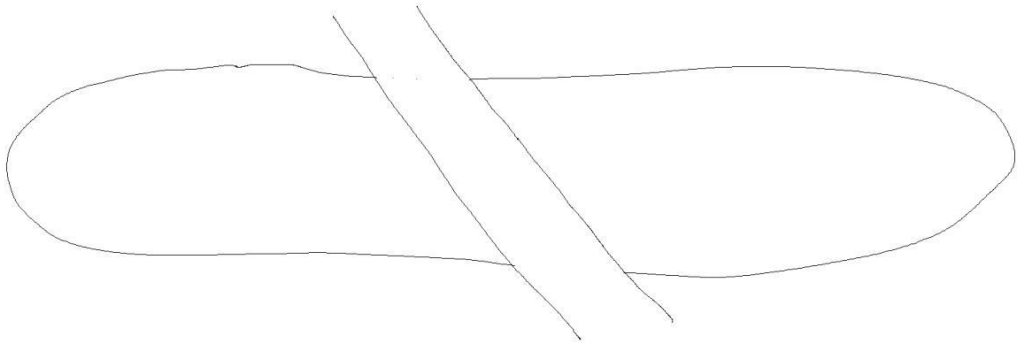
.....

.....

.....



- To maintain sustainable food production following methods can be applied, which are based on knowledge in biology.
  1. Production of high yielding varieties of plants and animals.
  2. Production of disease resistant plants and animal varieties.
  3. Improve the post harvest technological methods.



### 5. Understanding plant life

.....

.....

.....

.....

.....

.....

.....

.....



6. Understanding diseases and causes

.....

.....

.....

.....

.....

.....

.....



**1. Cancers**

- Causes for this is not fully understood yet.
- Cancers are one of the leading causes of death .

**2. AIDS**

- is a viral disease which is a serious and growing health problem worldwide.

**3. Heart diseases**

- This is also a serious and growing health problem world-wide.
- Causes are not fully understood yet.

**4. Chronic renal diseases of unknown etiology (CKDu)**

- In Sri Lanka, recently CKDu has become a serious health problem.

- Currently scientists are working on prevention, remedial measures and cures for such diseases.

**7. Solving some legal and ethical issues**

.....

.....

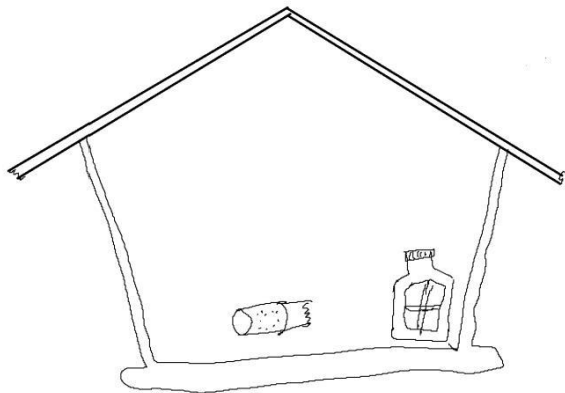
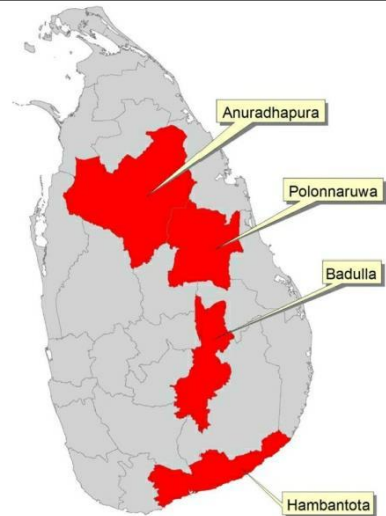
.....

.....

.....

.....

- DNA fingerprinting is used in above circumstances.



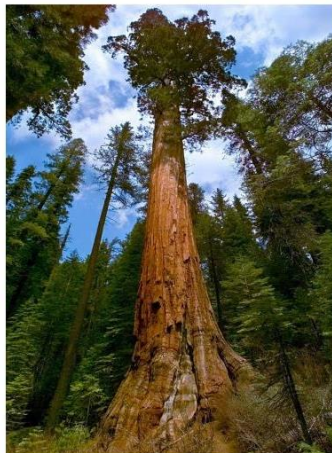
## The nature and the organizational patterns of the living world

- In accordance with different criteria we can see a diversity among living organisms.
- Organisms are diverse based on size, shape, form and habitats.
- Living organisms show a wide range of variation in size, shape, form and habitat.

### 1. Size – Bacteria – 1 $\mu\text{m}$ – 5 $\mu\text{m}$ to Giant Sequoia (Giant Red Wood)– 100m

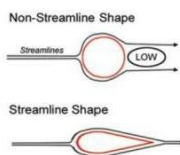


bacillus  
(rod)

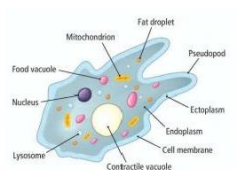


### 2. Shape – Organisms are diverse in shape

Eg: Cylindrical (earth worm), streamline shape (birds, fish)



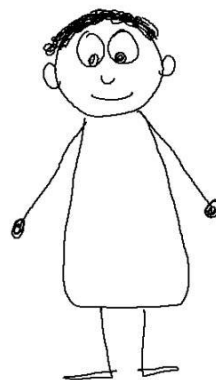
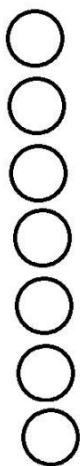
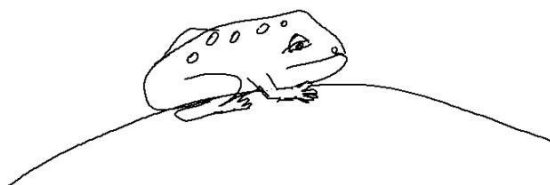
### 3. Form – Unicellular (Amoeba), multicellular (any plant or animal)

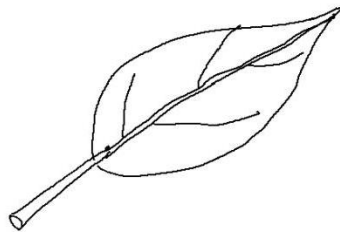


### 4. Habitat – Terrestrial (Rat), aquatic (Fish), arboreal (Loris), aerial (Birds)



Characteristics of organisms





- In order to survive, each organism whether simple or complex must be able to perform certain functions. Following features are the characteristics of organisms.

**(i) Order and organization**

.....

.....

.....

.....

.....

.....

**(ii) Metabolism**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**(iii) Growth and development**

.....

.....

.....

.....

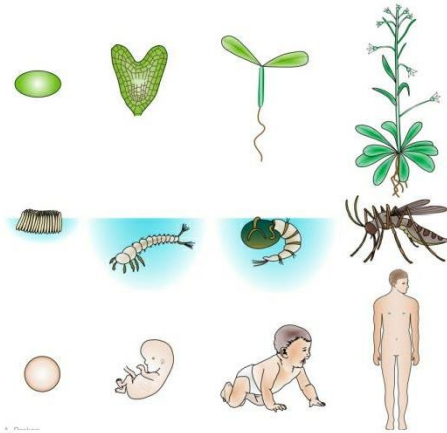
.....

.....

.....







**(iv) Irritability and coordination**

.....

.....

.....

.....

.....

.....



**(v) Adaptation**

.....

.....

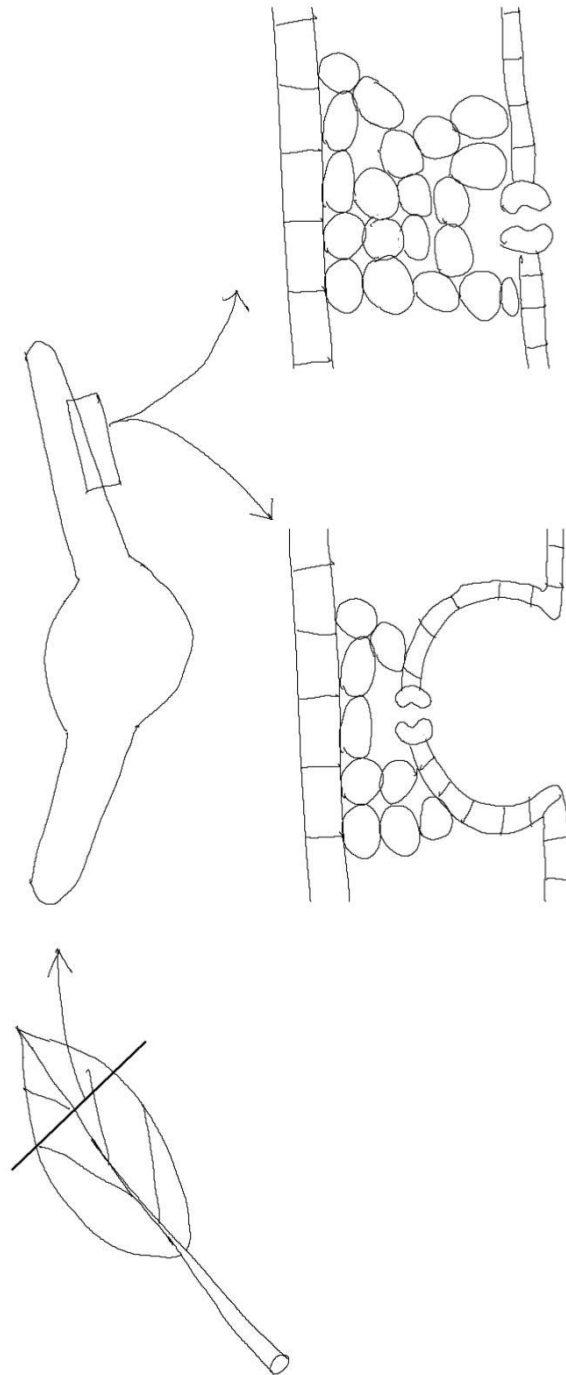
.....

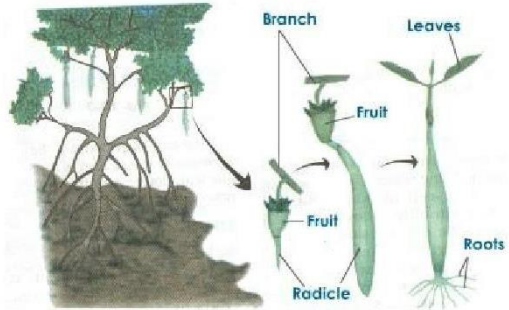
.....

.....



Eg: Sunken stomata in Xerophytes, Viviparity in some mangroves, Splayed out foot in camels.





**(vi) Reproduction**

.....

.....

.....

**(vii) Heredity & Evolution**

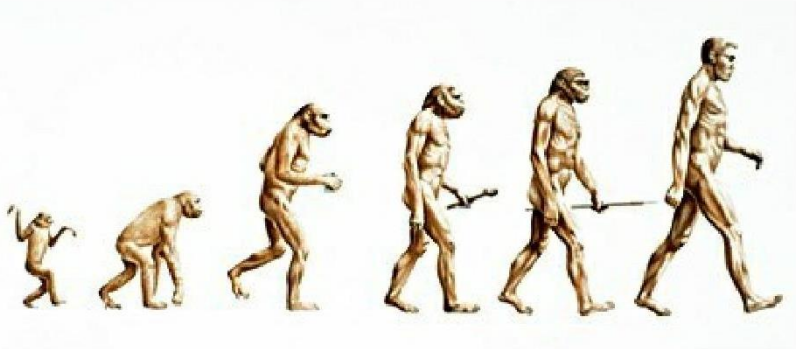
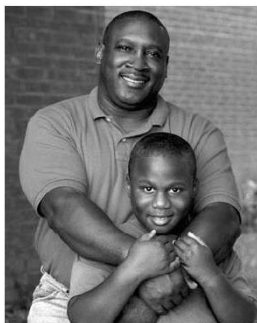
.....

.....

.....

.....

.....



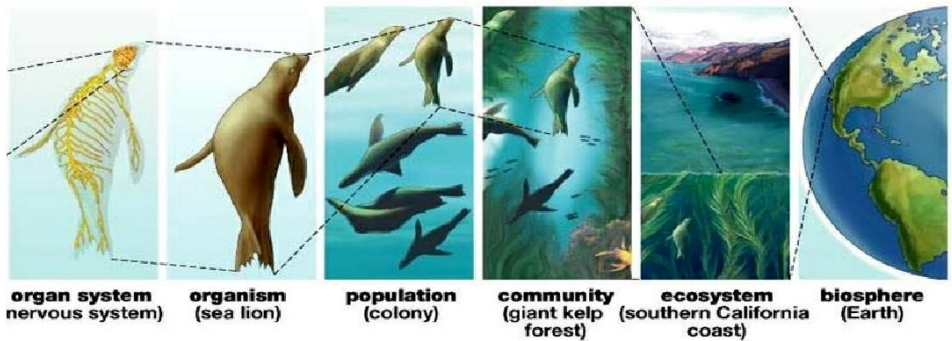
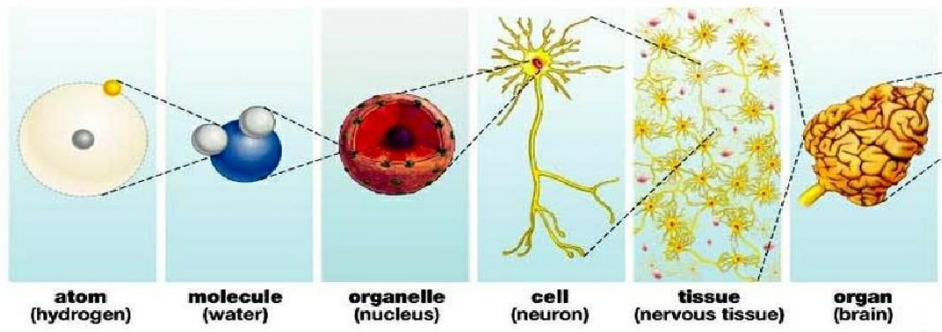
.....

.....

.....



Hierarchical levels of organization of living things



- Cell is composed of several organelles which are formed by different organic molecules.
  - Then hierarchical levels of organization of living things can be constructed by using relevant examples at each level.
1. Molecules
  2. Organelles
  3. Cells
  4. Tissues
  5. Organs
  6. Organ systems
  7. Organisms
  8. Populations
  9. Communities
  10. Ecosystems
  11. Biosphere



**1.1.1 Nature, scope and importance of biology with reference to challenges faced by the mankind**

1. What is biology

.....  
.....

2. What are 3 main primary branches of Biology.

.....

3. Find the relationship between followings

1.	Ecology	A	Study of biological molecules
2.	Anatomy	B	Study of gross structure
3.	Morphology	C	Study of inheritance
4.	Physiology	D	Study of appearance
5.	Histology	E	Study of environment
6.	Biochemistry	F	Study of tissues
7.	Genetics	G	Study of function

4. What is called as gross structure of an organism?

.....

6. What comprises biological diversity.

.....  
.....  
.....

7. What is the period of formation of life on earth.

.....

8. What was the nature of early formed life.

.....



9. Briefly explain these terms

Anaerobic

.....  
.....

Prokaryotic

.....  
.....

10. What is the assumed number of species of living organisms on earth

.....

11. What fields of study helps to gain knowledge of structure of organisms.

.....

12. What is the benefit we obtain by studying human histology and anatomy.

.....  
.....

13. What are natural resources.

.....  
.....

14. What is meant by over exploitation

.....

15. What are the possible environmental problems arise due to over exploitation of natural resources.

.....  
.....  
.....

16. What is sustainable food production.

.....  
.....



17. What is the expected time period to double the current human population.

.....

18. What methods can be applied to maintain sustainable food production.

.....  
.....  
.....

19. State 2 importance of plants.

.....  
.....

20. What is stand by CKDu

.....  
.....

21. What are the possible reasons for CKDu in Sri Lanka

.....  
.....  
.....

22. State few circumstances that use DNA finger printing.

.....  
.....  
.....  
.....  
.....



**MCQ**

23. Biology is the,  
(1) study of uniformity behind life (2) study of all living organisms  
(3) study of growth and differentiation of living organisms (4) study of life as recorded by fossils  
(5) study of differences among living organisms in world.
24. The field of study about function of living organisms.  
(1) Biochemistry (2) Taxonomy (3) Anatomy (4) Histology (5) Physiology
25. Which of the following statements incorrect regarding some of the emerging diseases  
(1) Cancer is a non communicable disease. (2) Dengue transmitted by Aedis mosquito  
(3) CKDu is caused by unknown type of microorganism  
(4) Cancer is caused by abnormal cell division (5) Heart disease cause is not fully understood yet.

**1.1.2 Reviews the nature and organizational patterns of the living world**

26. According to which criteria that the organisms show diversity.

.....

27. What is streamline body shape.

.....

.....

28. Define terrestrial organisms, arboreal organisms and aerial organisms?

.....

.....

.....

.....

.....

.....

29. What are main characters that distinguish living organisms from non living? (A/L 2011)

.....

.....

.....

.....





30. Write down the levels of organization of living matter in the correct order.

(A/L 2009)

.....  
.....

31. Define

Metabolism

.....  
.....

Growth

.....  
.....

Development

.....  
.....

32. Giving examples briefly explain what is anabolism and catabolism.

.....  
.....  
.....  
.....

34. How movements differ from locomotion?

.....  
.....  
.....

35. Define irritability and coordination.

.....  
.....  
.....  
.....



36. State whether following adaptations are structural, physiological or behavioral.

- 1. Camouflaging of the animal in its environment - .....
- 2. Slippery body of Tuna - .....
- 3. Trunk of Elephant - .....
- 4. Bones with air cavities in Birds - .....
- 5. Sunken stomata in xerophytes - .....
- 6. Viviparity in some mangroves - .....
- 7. Production of more sweat - .....
- 8. Splayed-out foot of camel - .....
- 9. Migration of birds - .....
- 10. Powerful jaws of Leopard - .....

37. Define reproduction.

.....  
.....

38. What are 2 methods of reproduction?

.....  
.....

39. State why reproduction is essential for continuity of life.

.....  
.....

40. What is heredity?

.....  
.....

41. State what is evolution.1

.....



42. What evidence suggests that we all have evolved from one ancestor?

.....  
.....

**MCQ**

43. Which of the following biochemical reaction is anabolic?

- (1) Conversion of starch to glucose (2) Conversion of proteins to dipeptides (3) Conversion of amino acids to proteins (4) Conversion of fat to fatty acids (5) Conversion of glucose to CO<sub>2</sub> and water (AL/2002)

44. Which of the following represent the correct order of organization of living matter?

- (1) Atoms, molecules, cells, tissues, organisms, organs, populations, communities, ecosystems, biosphere.  
(2) Atoms, molecules, organelles, cells, tissues, organs, organisms, populations, communities, ecosystems, biosphere.  
(3) Atoms, molecules, organelles, cells, tissues, organs, organisms, communities, populations, ecosystems, biosphere.  
(4) Atoms, molecules, organelles, cells, tissues, organs, organisms, populations, ecosystems, communities, biosphere.  
(5) Atoms, molecules, organelles, cells, organs, tissues, organisms, populations, communities, ecosystems, biosphere. (A/L 1997)

45. Which of the following shows an arrangement with increasing order of complexity?

- (1) Cell, organelle, organ (2) Tissue, cell, organism (3) Community, ecosystem, biosphere  
(4) Community, population, biome (5) Bacterial cell, viral particle, eukaryotic cell (A/L Bot 1994)

46. Which of the following is/are characteristic of living organisms?

- (1) Organic structure (2) responsiveness to stimuli (3) To maintain homeostasis  
(4) Arrangement of the body with many hierarchical levels (5) All of the above

47. Which of the following can be regarded as the lowest level of organization exhibiting characteristics of life?

- (1) Sub-atomic particles (2) Atoms (3) Molecules (4) Organelles (5) Cells (Bot A/L 2001)

48. Which of the following level is not considered as a level of organization of living matter?

- (1) Cell (2) Population (3) Species (4) Ecosystem (5) Biosphere (A/L 1999)

49. Some of the characteristics of living beings are given below. Among those, which features is not shown by an individual animal.

- (1) Irritability (2) Evolution (3) Reproduction (4) Heredity (5) Adaptation (Biology Olympiad 2012)

50. Which of the following is a correct sequence of levels in life's hierarchy, proceeding downward from an individual animal?

- (1) brain, organ system, nerve cell, nervous tissue (2) organ system, nervous tissue, brain  
(3) organism, organ system, tissue, cell, organ (4) nervous system, brain, nervous tissue, nerve cell  
(5) organ system, tissue, molecule, cell

51. Two characteristics that can be seen only in living organisms are

- (1) adaptation and growth. (2) movement and irritability.  
(3) change with time and development. (4) metabolism and heredity. (5) synthesis and decomposition. (A/L 2023/02)




## Essay 01—Answer

### 1. Briefly describe issues and challenges pertaining to biology.

1. Evolutionary process had resulted in the extensive biodiversity.
2. There are about 10 to over 100 million species in the world.
3. The variety of life on earth, the number of species of plants, animals and microorganisms,
4. the diversity of genes in these species,
5. the different ecosystems on the earth such as deserts, rainforests and coral reefs are all part of a biologically diverse earth.
6. Because of this vast diversity, understanding biological diversity is challenging.
7. Studying histology, anatomy of the human body, one can gain the knowledge about the structure of the organs.
8. This results in understanding and appreciation of the organization of the human body.
9. Human body is complex and understanding the human body and its functions is a challenge.
10. Natural resources are sources of materials and energy found naturally which are used in everyday life and for economic development.
11. These natural resources are limited on earth.
12. Due to the increase of growth rate of human population, overuse of natural resources is taking place.
13. It causes threat of depletion of natural resources. Due to over exploitation of natural resources, various environmental problems arise such as;
14. Environmental pollution
15. Loss of biodiversity
16. Desertification
17. Sustainable use and management of natural resources and environment is an a challenge.
18. Hence proper management of natural resources and environment should be practiced.
19. Knowledge in biology is useful to bring about remedies for the above problems.
20. Sustainable food production is the production of sufficient amounts of food for the human population using environmentally safe methods.
21. Its and issue due to increasing human population and narrowing of agricultural land. To maintain sustainable food production,
22. Production of high yielding varieties of plants and animals.
23. Production of disease resistant plants and animal varieties.
24. Improve the post harvest technological methods can be done.
25. Understanding plant life is a challenge due to their complexity.
26. Plants are the primary producers in the world.
27. All the animals depend directly or indirectly on plants.
28. Therefore understanding plant life is important.
29. As human population is increasing with time, we need to increase plant productivity.
30. Understanding diseases and causes is a challenge
31. To maintain healthy human body one should have the knowledge of causes of the diseases and their effects.
32. Cause for cancers is not fully understood yet.
33. AIDS is a viral disease which is a serious and growing health problem worldwide.
34. Heart diseases is also a serious and growing health problem worldwide.
35. Chronic renal diseases in Sri Lanka has become a serious health problem.
36. Therefore it is an issue and currently scientists are working on prevention, remedial measures and cures for such diseases.
37. Knowledge and application of biological concepts is important in solving some legal issues,
38. such as parentage testing, in criminal investigations and to solve immigration disputes.
39. DNA fingerprinting is used in above circumstances. (Marks 4 x 38 points = 152 Marks)



<https://advanceonlineclass.com>

 sampath lankadheera

 0777 211 384  
0779 925 362



Join Your Class  
Discord Sever