Chapter 1. An Introduction

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Solution 1:

Biology is the branch of science dealing with the study of living organisms.
The two main branches of Biology are Botany and Zoology.

Solution 2:

Biology is the branch of science dealing with the study of living organisms including their structure, evolution, growth and environment.
Biology is important in our daily life in the following ways:

1. **Food** – Study of various food components helps in understanding balanced diet and its significance. We get food directly or indirectly through agriculture, which is helped by the studies of different branches of Biology.
2. **Health** – Biology helps us to understand structure and functions of our various body parts as well the various diseases that we suffer from and their cure.
3. **Agriculture** – Biology helps us to increase the overall agricultural production by providing knowledge about new methods of farming, improved seed varieties and crop protection against many diseases.
4. **Clothes** – Materials for making clothes like wool, fur and silk are obtained from animals whereas cotton is obtained from plants. Biology deals with these animals and plants.
5. **Industry** – Many industries are based on animal and plant products like leather, horn, shells, honey, wax, pearl, wood, rubber etc. Increased manufacture of these products can be achieved using the knowledge of Biology.
6. **Human Diseases** – Many animals cause and transmit diseases. Also many animals are used for testing new drugs before use on humans. The tremendous advances in human physiology, medicine and surgery have come from the study of zoology.
7. **Aesthetic value** – We keep many animals like birds, fishes and butterflies for entertainment and hobby. Visiting gardens and parks also gives us aesthetic pleasure. Biology helps in the study of these animals and plants to provide us better aesthetic value.
8. **Improvement of domestic animals** – Raising improved breeds of domestic animals gives better yields and this is made possible by zoology and genetics.
9. **Space research** – Biology helps in man’s quest of knowing about extra terrestrial life.

Solution 3:

Zoology	Entomology
The study of animals	The study of structure, habit and classification of insects.

Mycology	Virology
Scientific study of fungi	Scientific study of virus

Pathology	Microbiology
Study of different types of plant and animal diseases	Study of microorganisms

Palaeobotany	Palaeozoology
Study of fossils of plants	Study of fossils of animals

Genetics	Cytology
Study of heredity and inheritance	Study of structure and functions of the cell

Solution 4:

Study of Biology is advantageous to us in many ways. These are:

1. It helps us to understand ourselves better such as our body activities, our hereditary, our evolution, need for food, life and death etc.
2. It helps us to remain healthy and fit by knowing our body structure and functioning.
3. It tells us about the types of human diseases and their causes. It also helps in the prevention and cure of human diseases.
4. Biology ensures maximum utilization of resources available to us such as increasing crop production, improving breeds of useful animals, using microbes in food, industry and medicine, curing diseases and overall improving the quality of life.
5. It informs us about the negative consequences of excessive use of fertilizers and pesticides like degradation of soil quality and harming living beings including humans through food chains.
6. Biology tells us about the problems of deforestation and its effects on the environment.
7. It makes us aware about the causes and harmful effects of pollution and ways of controlling it.
8. Biology stresses the need for conservation of natural resources, so that they are available to future generations.
9. It informs us about our responsibility towards other forms of life and our planet at large, for sustainable living.
10. It makes us aware of the need to maintain the delicately balanced ecosystem containing various food chains and food webs.
11. Biology solves many problems facing mankind such as eradication of fatal diseases, decreasing environmental pollution, increasing food supply, recharging fresh water resources etc.

Solution 5:

The five main branches of Biology are:

1. **Zoology** – It is the study of animals
2. **Botany** – It refers to the study of plants
3. **Microbiology** – It refers to the study of microorganisms
4. **Ecology**– It deals with the study of relationship between living organisms and their environment.
5. **Pathology**– It deals with the study of different types of plant and animal diseases.

Solution 6:
Zoology is the branch of Biology dealing with the study of animals.
Botany is the branch of Biology dealing with the study of plants.

Solution 7:

- **Morphology** is the study of the form and structure of living organisms.
- The study of tissues of organisms with the help of microscopes is called **histology**.
- **Ecology** is the branch of biology dealing with the study and relationship of environment with living organisms and its effect on structure, distribution and habitat.
- **Genetics** is defined as the study of heredity and inheritance.
- **Biochemistry** is the study of the metabolic activities of chemical materials.
- **Pathology** is the branch of Biology dealing with the study of different types of plant and animal diseases, their symptoms, causative agents and methods of control.

Solution 8:

- Paleontology / Palaeobiology
- The Greek philosopher, Aristotle
- Lamarck and Treviranus coined the term Biology in 1801.
- Ecology
- Teratology
- Theophrastus

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Solution 9:
Physiology – Vital activities
Microbiology – Microbes
Embryology – Life-cycle
Entomolgy – Insects
Cytology – Cells
Histology – Tissues

Solution 10:

Differences between plants and animals:

Character	Plants	Animals
Size	Generally not definite	Size is definite
Chlorophyll	Present in all plants	Absent in animals except in *Euglena*
Mode of nutrition	Autotrophic, taking in water and carbon dioxide	Heterotrophic, taking in solid complex food materials.
Growth	Indefinite and unlimited, growing throughout life	Definite and limited, stop growing in size after a certain age
Locomotion	Usually fixed on ground and unable to move, except for a few lower plants	Usually move from place to place for food and other requirements, except for a few animals fixed to a place.
Organs	No special organs for respiration, excretion and digestion	Special organs for respiration, excretion and digestion in higher animals
Nervous system and sense organs	Sense organs and nervous system absent	Sense organs and nervous system present in most animals
Excretory system	Absent	Present
i. Cell structure: **ii. Cell wall**	Present	Absent
iii. Centrosome	Absent in plant cells except in few plants	Present near the nucleus
iv. Vacuoles	Present	If present, small and temporary
v. Stored food	In the form of starch	In the form of glycogen

Solution 11:

Areas of Biology which have developed recently are:

1. Enzymology
2. Immunology
3. Genetic Engineering
4. Radiation Biology
5. Forensic Science
6. Biophysics
7. Cybernetics

(Write any three)

Solution 12:

1. (b) All living beings
2. (b) Cell, tissue, organ system
3. (a) Lamarck and Treviranus
4. (c) respire all the time
5. (b) genetics