

Progress Check

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1. Name the specific branches of Biology concerned with the study of

- (i) Fungi (ii) Fishes (iii) Insects (iv) Transmission of body characteristics from parents to children**

Solution:

The specific branches of Biology related with the study of the following are:

- (i) Fungi – Mycology
- (ii) Fishes – Ichthyology
- (iii) Insects – Entomology
- (iv) Transmission of body characteristics from parents to children – Genetics

2. Mention the kind of study made under the following branches of science:

- (i) Histology (ii) Ecology (iii) Cytology (iv) Pathology**

Solution:

Listed below are branches of science dealing with corresponding fields of study:

- (i) Histology – It is the study of minute structures of tiny bits at the tissue level of the body as observed under a compound microscope.
- (ii) Ecology – It is the study of the relationship of an entity relative to its abiotic (non-living) and biotic (living) environment.
- (iii) Cytology – It is the study of function and structure of plant and animal cells.
- (iv) Pathology – It is the study of plant and animal diseases.

Review Questions

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A. Multiple Choice Type

1. Choose the most appropriate option in the following statements.

(a) Paleontology is the study of

- (i) Embryos (ii) Blood (iii) Classification (iv) Fossils

Solution: (iv) Fossils

It is the study of prehistoric forms of life through fossils of animals and plants.

(b) Clones of animals are being produced through the practice of

- (i) Genetics (ii) Ecology (iii) Embryology (iv) Biotechnology

Solution: (iv) Biotechnology

This field deals with using cells or microorganisms in technology and industry.

B. Very Short Answer Type

1. Name the following branches of biology

- Application of biological processes in technologies
- Science of growing fruits and vegetables
- Study of prehistoric forms of life
- Study of causes of immunity (resistance to or defense against diseases)
- Study of fishes

Solution:

- Biotechnology
- Horticulture
- Paleontology
- Immunology
- Ichthyology

2. Fill in the blanks:

- Bioengineering deals with making artificial _____.
- _____ is the entire DNA sequence of an organ.
- Silk is produced by rearing _____
- Evolution deals with the study of _____ and _____ of organisms.
- Organisms which draw food from the host body are called _____
- Animals which give birth to young ones are known as _____
- _____ is called the Father of Medicine.

Solution:

- Joints and Limbs
- Genome
- Silkworm
- Descent, origin
- Parasites

- (f) Viviparous
- (g) Hippocrates

3. Match the branches of biology in Column A with the respective areas of study in Column B.

<u>Column A</u>	<u>Column B</u>
Ichthyology	Viruses
Ornithology	Fishes
Ecology	Birds
Virology	Cells
Herpetology	Diseases
Paleontology	Fossils
Cytology	Snakes
Pathology	Environment

Solution:

<u>Column A</u>	<u>Column B</u>
Ichthyology	Fishes
Ornithology	Birds
Ecology	Environment
Virology	Viruses
Herpetology	Snakes
Paleontology	Fossils
Cytology	Cells
Pathology	Diseases

4. Name any two borderline sciences which are connected with Biology.

Solution:

Listed below are two sciences interlinked with Biology:

- Biotechnology
- Biometrics

5. Name the respective sub-divisions of biology which deal with the study of insects, birds, fungi and heredity.

Solution:

Listed below are the branches of biology which deals with the respective fields:

Study of insects – Entomology

Study of birds – Ornithology

Study of Fungi – Mycology

Study of heredity – Genetics

6. Name some professions other than medicine which require a basic knowledge of Biology.

Solution:

Medicine is a field of health and healing whereas biology is a natural science that deals with life and living entities. Listed below are few professions apart from medicine that necessitate some Biology

knowledge:

- Lecturers
- Pathologist
- Microbiologist
- Genetic engineer
- Biotechnology engineer

C. Short Answer Type

1. What is biology? Name and define its three major branches.

Solution:

Biology is one of the major branches of science. It is a natural science which deals with study of living beings, that is to say animals, plants and even humans. Biology is derived from a Greek: 'bios' meaning life and 'logos' meaning study. Biology on the whole can be sub-divided into three major branches, namely:

- Botany – Botany is a branch of biology dealing with study of plants
- Zoology – Zoology is a field of biology concerning with animal study
- Human Biology – It deals with humans as a living entity and their relationship with other entities.

2. How does Biology help us in leading a healthier life?

Solution:

Biology is a study of living entities; hence it helps in understanding the behavioral characteristics of the living. The knowledge and study of biology has immensely helped in human health and advancement. Basic knowledge can help in self-analyzing causatives of diseases, different microbes causing diseases. Thereby examining and studying their mode of living and propagating diseases. This study has paved the way for production of new drugs synthesized naturally or synthetically killing causatives of diseases.

3. A farmer and a housewife may have never studied biology, yet both of them know some of its general principles through experience. State any two principles which they know.

Solution:

Housewives have a good knowledge of grocery – vegetables, millets, grains, fruits etc. They have an idea of the time taken to grow these crops and also about the nutritional benefits of various crops. She can suggest first hand treatment for simple cold, cough and other mild mishaps.

Although a farmer may have never studied the subject biology, he still has knowledge of crop production which is a science in itself. Right from selecting germfree seeds to sow, act of ploughing, crop plantation, using fertilizers, irrigation and its types, crop harvesting, cross-breeding with other plants, weed removal, etc, they have knowledge of basic biological concepts.

4. Distinguish between the following pairs of sciences:

- (a) Zoology and Entomology
- (b) Genetics and Eugenics
- (c) Phycology and Mycology

- (d) Space Biology and Exobiology
- (e) Biotechnology and Bioinformatics
- (f) Embryology and Immunology
- (g) Ichthyology and Pisciculture

Solution:

Listed below are the differences between the different fields of science.

(a)

Zoology	Entomology
It is the study of animals	It is the study of insects

(b)

Genetics	Eugenics
It is the science of passing body characteristics from parents to their offspring which includes both differences and similarities.	It is a science aiming at improving human race via controlled heredity.

(c)

Phycology	Mycology
It deals with scientific study of algae	Deals with the study of fungi

(d)

Space Biology	Exobiology
It is a field of study concerning the survival problems of things that are living in outer space.	Relatively a newer field of science that considers the study of life away in the universe.

(e)

Biotechnology	Bioinformatics
Usage of microbes or living cells in technology and industry.	It is the analysis and management of biological data that is assembled in databases.

(f)

Embryology	Immunology
It is a field of biology that deals with the embryo development in animals and plants.	It is a science dealing with the process and causative of immunity(defend against/resist diseases)

(g)

Ichthyology	Pisciculture
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It is concerned with study of fishes.	It deals with the technique of growing fishes.
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D. Long Answer Type

1. Do you think Biology can help in further increasing the yield of food? If so, how?

Solution:

Yes, Biology can help in enhancing food yield. The advancement in the field of biology and adaptation of technological principles in this field of science has paved way for newer milestones in health and life sciences. Plants and animals of newer varieties are cultivated by cross-breeding through the application of biotechnological principles, unleashing unexplored concepts for a brighter future. Implementation of these biological principles to tackle current environmental issues and breakthrough in the field of medicine has been the vision. Knowledge of science has also increased awareness of various unknown plant and animal diseases, their diagnosis and probable treatment thereby contributing to the wellness of human welfare ultimately.