Allguidesite -
- Arjun
- Digvijay

Maharashtra State Board 11th Biology Solutions Chapter 1 Living World

1. Choose correct option

Question A.
Which is not a property of living being?
a. Metabolism
b. Decay
c. Growth
d. Reproduction
Answer:
b. Decay

Question B.
A particular plant is strictly seasonal plant. Which one of the following is best suited if it is to be studied in the laboratory?
a. Herbarium
b. Museum
c. Botanical garden
d. Flower exhibition
Answer:
a. Herbarium

Question C.
A group of students found two cockroaches in the classroom. They had a debate whether they are alive or dead. Which life property will help them to do so?
a. Metabolism
b. Growth
c. Irritability
d. Reproduction
Answer:
c. Irritability

Question 2.
Distinguish between botanical gardens, zoological park and biodiversity park with reference to characteristics.
Answer:

No.	Botanical Gardens	Zoological Parks	Biodiversity Parks
1.	Plants of different varieties collected from different parts of the world are grown in vivo in a scientific and systematic manner in a botanical garden.	Zoological parks are places where wild animals are kept in captivity.	It is an assemblage of species that form self-sustaining communities on degraded barren landscape.
2.	It is a type of ex situ conservation.	It is a type of ex situ conservation.	It is a type of in situ conservation.
3.	It is related to conservation of various	It is related to conservation of various fauna.	It is related to conservation of all biodiversity.

3. Answer the following questions

Question A.
Jijamata Udyan, the famous zoo in Mumbai has acclimatised humbolt penguins. Why should penguins be acclimatised when kept at a place away from their natural habitat?
Answer:

1. Zoological park (zoo) is a type of ex-situ conservation in which wild animals are kept in captivity.
2. Humboldt penguins are native to South America and the surrounding environment differs significantly at Jijamata Udyan (zoo) in Mumbai.
3. In order to ensure that these penguins survive longer and are healthy they need to be acclimatised (adjust) to their new environment slowly.

4. If they are not acclimatised or the facilities in the zoo where the penguins are kept are not optimal/ suitable, they may develop abnormal stress and exhibit unusual behaviours due to it.
5. These penguins may also be more prone to contracting certain diseases, since they are suited to living in a particular climatic condition.
6. The enclosure of these penguins consists of water pool, air handling units and a chiller system to maintain temperatures between 12 – 14°C, where the penguins were kept for around 8 to 10 days to get acclimatised to their new environment before allowing any visitors inside the zoo.

Hence, Humboldt penguins need to be acclimatised to their new surroundings, when kept at a place away from their natural habitat.

Question B.
Riya found peculiar plant on her visit to Himachal Pradesh. What are the ways she can show it to her biology teacher and get information about it?
Answer:

1. Riya can press and mount the plant specimen on a herbarium sheet and preserve the dried plant material, until she returns back from her visit.
2. She can also write any available information regarding the collected specimen on the herbarium sheet, which can be useful for further studies with her biology teacher.
3. Various taxonomical aids can be useful to get information about this peculiar plant.

[Note: In order to conserve the local flora, Riya can collect photographs of plant and describe it's structure to her teacher.]

Question C.
At Andaman, authorities do not allow tourists to collect shells from beaches. Why it must be so?
Answer:

1. Seashells are an important part of the coastal ecosystem and are crucial for the survival of various marine creatures.
2. They provide material for building nests of birds and also act as a substratum for attachment of algae, sea grass, sponges and various microbes.
3. Fishes use shells for hiding from predators, whereas hermit crabs use shells as temporary shelters.
4. Removal of seashells from seashores may also indirectly affect the rate of shoreline erosion.

Hence, in an attempt to protect the ecosystem, authorities in Andaman do not allow tourists to collect shells from beaches.

Question D.
Why do we have green house in botanical gardens?
Answer:

1. Greenhouse is a structure with suitable walls and a roof in which plants are grown under regulated climatic conditions.
2. Most botanical gardens exhibit ornamental plants which require stringent/ optimum climatic conditions for their growth and/or flowering.
3. The greenhouse associated with botanical gardens are also used to grow and propagate those plants that may not survive seasonal changes.

Hence, in order to provide optimum temperature for better growth and flowering and also to protect the plants from certain diseases, there are greenhouses in botanical gardens.

Question E.
What do you understand from terms like in situ and ex situ conservation?
Answer:

1. In situ conservation: It includes conservation of species in their natural habitats. Grazing, cultivation and collection of products from the forests is banned in such areas. Legally protected areas include national parks, wildlife sanctuaries and biosphere reserves.
2. Ex situ conservation: It includes conservation of species outside their natural habitats. Species are conserved in botanical gardens, culture collections and zoological parks.

4. Write short notes

Question A.
Role of human being in biodiversity conservation.
Answer:

1. Due to rapid increase in human population and industrialization, humans have over utilized natural resources; leading to degradation of the environment and hence only humans can help conserve the ecosystem.
2. Humans are capable of conserving and improving the quality of nature and thus, can play a major role in biodiversity conservation.
3. In order to conserve biodiversity and its environmental resources, humans must use the resources rationally and avoid excessive degradation of environment.

4. Human beings are stakeholders of the environment and need to come together to overcome pollution and improve the environment quality in order to conserve biodiversity. E.g. Ban or limit on use of harmful products (plastic, chemicals, etc.) that are toxic to various birds, animals, etc.
5. Human beings also play a role in conservation of biodiversity by establishment of various sites for in situ (national parks, wildlife sanctuaries and biosphere reserves) and ex situ (botanical gardens, culture collections and zoological parks) conservation.

Question B.
Importance of botanical garden.
Answer:
The importance of botanical gardens is as follows:

1. It is a place where there is an assemblage of living plants maintained for botanical teaching and research purpose.
2. Botanical gardens are important for their records of local flora.
3. Botanical gardens provide facilities for the collection of living plant materials for botanical studies.
4. Botanical gardens also supply seeds and material for botanical investigations.
5. The development of botanical gardens in any country is associated with its history of civilization, culture, heritage, science, art, literature and various other social and religious expressions.
6. Botanical gardens besides possessing an outdoor garden may contain herbaria, research laboratory, greenhouses and library.
7. Botanical gardens are not only important for botanical studies, but also to develop tourism in the country.

Question 5.
How can you, as an individual, prevent the loss of Biodiversity?
Answer:
As individuals, we can prevent loss of biodiversity in the following ways:

1. Increasing awareness about environmental issues. Making posters that provide more information about biodiversity conservation, to raise public awareness.
2. Increased support and/ or active participation in government policies and actions laid down for conservation of biodiversity.
3. Protect various plant and animal species in our surrounding.
4. Set up bird and bat houses wherever possible.
5. Prevent felling of trees especially native plants or trees in a particular area.
6. Reduce, recycle and reuse resources. Especially, reduce pollution and use of plastic bags and other materials that are potential threats for the environment.
7. Use environment friendly products, segregate and dispose garbage correctly.
8. Convince people about the importance of trees and the need to participate in tree plantation campaign.
9. Obey the rules that fall under Biodiversity Act.

[Students can use the given points as reference and mention additional preventive measures on their own.]

Practical / Project :

Question 1.
Make herbarium under the guidance of your teacher.
Answer:
Students are expected to perform the given activity by themselves under the guidance of their teacher.

Question 2.
Find out information about any one sacred grove (devrai) in Maharashtra.
Answer:
Sacred groves in Maharashtra are located in districts like Ahmednagar, Bhandara, Chandrapur, Jalgaon, Kolhapur, Nashik, Pune, Raigad, Ratnagiri, Sangli, Satara, Sindhudurg, Thane, Yavatmal.
[Source: Data as per C.P.R. Environment Education Centre, Chennai.]
e. g. Sacred grove of Parinche valley, Pune district of Maharashtra:

The Parinche valley region is comprised of the inaccessible rear part of the Purandhar fort and its surrounding valley region and is situated about 63 km to the southeast of Pune city and 18 km from Saswad town. The total area of the valley region is about 132 sq. km. Parinche is the biggest village and a nodal place in the valley. The majority (12) of the documented groves are located in the Kaldari and Pangare zones. The size of the sacred groves has however reduced due to various human related activities that have taken place in recent years.

The biggest sacred grove in the Parinche valley belongs to Buvasaheb of Tonapewadi and spreads over an area of 4.80 hectares. The forest types are unique to the groves. Presence of key species in the sacred groves varies from region to region. Two key tree species, i.e. Terminalia bellerica and Ficus spp., are present in these sacred groves which have almost disappeared from the surrounding areas. Large buttressed trees are another important feature of well-preserved sacred groves. The presence of these tree species indicates the vegetation of the past and also the type of potential vegetation that can be regenerated in these regions.

[Source: Waghchaure, C. K., Tetali, P., Gunale, V. R., Antia, N. H., & Birdi, T. J. (2006). Sacred Groves of Parinche Valley of Pune District of Maharashtra, India and their Importance. Anthropology & Medicine, 13(1), 55-76]
[Students can refer the given answer and search for more information about other sacred groves on their own.]

11th Biology Digest Chapter 1 Living World Intext Questions and Answers

Can you recall? (Textbook Page No. 1)

Question 1.
Whether all organism are similar? Justify your answer.
Answer:
No, all organisms are not similar.

1. Organisms on the earth exhibit great diversity.
2. Organisms are grouped as microbes, plants (autotrophs), animals (heterotrophs) and decomposers.
3. Different microbes and decomposers have various shapes and sizes.
4. Plants can be further classified on their shape, size, structure, mode of reproduction, etc. Plants also differ greatly based on the locations in which they are found, e.g. Snowy, desert, forest, aquatic, etc.
5. Even animals show a high degree of variation. They are classified as unicellular, multicellular, invertebrates, vertebrates, etc. Also, based on the environment in which they live, they are classified as terrestrial, aerial, aquatic and amphibians.

Question 2.
What is the difference between living and non-living things?
Answer:

	Living Things	Non-living Things
a.	Living things show growth from within.	Non-living things show growth by accumulation of materials on their surface.
b.	They reproduce asexually or sexually, except mules, sterile worker bees, infertile males.	They do not reproduce.
c.	They perform metabolism in order to obtain energy.	No metabolic changes occur in non-living things.
d.	They show irritability and respond to changes in their surroundings.	They do not show irritability.
e.	They undergo ageing and eventually die.	Non-living things do not have a finite life span.

Question 3.
Enlist the characters of living organisms.
Answer:
The basic principles of life are as follows:

1. Metabolism: Metabolism is breaking of molecules (catabolism) and making of new molecules (anabolism). An organism performs metabolism in order to obtain energy and various chemical molecules essential for survival.
2. Growth and development: Organisms tend to grow and develop in a well-orchestrated process from birth onwards.
3. Ageing: It is the process during which molecules, organs and systems begin to lose their effective working and become old.
4. Reproduction: For continuity of race (species), organisms reproduce (asexually or sexually) to produce young ones like themselves. However, mules and worker bees do not reproduce, yet are living.
5. Death: As the body loses its capacity to perform metabolism, an organism dies.
6. Responsiveness: Living organisms respond to thermal, chemical or biological changes in their surroundings.

Can you tell? (Textbook Page No. 1)

Question 1.
Whether all organisms prepare their own food?
Answer:
No, all organisms do not prepare their own food. Organisms that prepare their own food are known as autotrophs (e.g. Green plants, certain microbes). These organisms prepare their own food in the presence of sunlight, water and carbon dioxide.

Question 2.
Which feature can be considered as all-inclusive characteristic of life? Why?
Answer:
Metabolism can be considered as an all-inclusive (defining) feature of life since it is exhibited by all living organisms and does not take place in non-living things.

Another all-inclusive characteristic of life is responsiveness or irritability. This is a unique property of living beings since all living beings are conscious of their surroundings.

Question 3.
How can we study large number of organisms at a glance?
Answer:
Systematic study of organisms with the help of taxonomical aids can be used to study a large number of organisms at a glance.

Can we call? (Textbook Page No. 1)

Question 1.
Reproduction as inclusive character of life?
Answer:
No, we cannot call reproduction as an inclusive character of life. Certain organisms like mules and worker bees do not reproduce and are still living. Thus, reproduction cannot be considered as an all inclusive defining characteristic of living organisms.

Think about it (Textbook Page No. 1)

Question 1.
Can metabolic reactions demonstrated in a test tube (called 'in vitro' tests) be called living?
Answer:

- The sum total of all the chemical reactions occurring in the body is known as metabolism and no non¬living object exhibits metabolism.
- However, metabolic reactions can be demonstrated outside the body in a test tube (cell-free medium).
- Thus, isolated metabolic reaction (s) outside the body of an organism, performed in a test tube is neither living nor non-living.
- Metabolic reactions occurring in vitro are living reactions but not living things.

Question 2.
Now a days patients are declared 'brain dead' and are on life support. They do not show any sign of self-consciousness. Are they living or non-living?
Answer:
The brain controls all life processes. Hence, when a patient is declared as 'brain dead', he does not carry out any of the inclusive defining characters of living things (e.g. metabolism, consciousness, etc.) and is completely dependent on machines. Since, such patients do not show any sign of self-consciousness, these patients cannot exactly be called as living.

Internet my friend (Textbook Page No. 2)

Question 1.
Collect information about Prof. Almeida, Prof. V. N. Naik, Dr. A. V. Sathe, Dr. P. G. Patwardhan with reference to their taxonomic work and biodiversity conservation.
Answer:
i. Prof. Almeida:
Prof. (Dr.) Marselin R. Almeida was a renowned Plant Taxonomist and Medicinal Plant Consultant of India. He was a curator at the Blatter Herbarium (Mumbai). He discovered four new species of pteridophytes from Bombay presidency. His work includes – Pteridophytes of Maharashtra and Flora of Mahabaleshwar. He has contributed to the Flora of Maharashtra, Sawantwadi and its adjoining areas along with Dr. S. M. Almeida.

ii. Prof. V. N. Naik:
Prof. V. N. Naik is a renowned 'Angiosperms Taxonomist' of India. He completed the Flora of Marathwada. He has produced 15 Ph.D., 110 research articles and 6 books. His book on 'Taxonomy of Angiosperms' (Tata McGraw-Hill Education, 1984) is widely used throughout the world. He is currently a faculty of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.
[Source: http://www. bamu. ac. in/dept-of-botany/Achievements, aspxj]

iii. Dr. A. V. Sathe:
Collection and taxonomic studies of mushrooms in Maharashtra started around 1974. Prof. A.V. Sathe and his team were amongst the first to begin these studies. They recorded 75 species distributed in 43 genera. These species were collected from Maharashtra, Karnataka and Kerala. The collection of these species was documented in the form of a Monograph on Agaricales.
[Source: Borkar P., Doshi A., Navathe D. (2015) Mushroom diversity of Konkan region of Maharashtra, India. Journal of Threatened Taxa. 7(10): 7625-7640]

iv. Dr. P. G. Patwardhan:
Dr. Patwardhan and his associates at the M.A.C.S. Research Institute, Pune-renamed as Agharkar Research Institute (ARI), Pune have performed detailed studies on lichens. His school is in possession of over 600 species of crustose lichens, obtained after intensive collection programmes. These specimens have been deposited in the Ajarekar Mycological Herbarium in the Department of Mycology and Plant Pathology at the M.A.C.S. Research Institute, Pune.
[Source: http://lib.unipune.ac.in:8080/xmlui/bitstreamfhandle/l23456789/7451/07_introduction.pdf? sequence=7&is Allowedly]
[Students are expected to find more information on their own.]

Can you tell? (Textbook Page No. 3)

Question 1.
What are the essentials of a good herbarium?
Answer: The essentials of a good herbarium are as follows:

1. It is essential to identify and label the collected specimen correctly.
2. Specimens should be stored in a dry place.
3. The plants are usually pressed and mounted on the sheet of paper known as herbarium sheets. Some plants are not suitable for pressing or mounting, like succulents, seeds, cones, etc. They need to be preserved in suitable liquid like formaldehyde, acetic alcohol, etc.
4. In order to preserve the specimen for longer durations, acid-free paper, special glues and inks must be used to mount the specimen so that the specimen does not deteriorate.
5. The specimens should be dried well before preparing a herbarium in order to prevent rotting of specimen.
6. It is also essential to record the date, place of collection along with detailed classification and highlighting with its ecological peculiarities, characters of the plant on a sheet. Local names of plant specimens and name of the collector may be added. This information is given at lower right comer of sheet and is called 'label'.

Question 2.
Why does the loss of biodiversity matter?
Answer:

1. The loss of biodiversity is an moral and ethical issue.
2. Biodiversity helps to maintain stability in an ecosystem.
3. Humans share the environment with various other organisms and harm to these species can result in loss of biodiversity.
4. The loss of even one variety of organisms can affect the entire ecosystem.
   Hence, due to all these reasons, loss of biodiversity matters.

Question 3.
Why should we visit botanical gardens, museums and zoo?
Answer:

1. Botanical gardens, museums and zoos are taxonomical aids which can be used to study biodiversity.
2. Botanical gardens have a wide range of plant species that are protected and preserved which can be observed and studied.
3. Museums help gain information about various plants and animals that are preserved and may even be extinct. They act as reference hubs for biodiversity studies.
4. Zoos provide information about various animals. They also harbour certain endangered animals and help us understand the role of biodiversity conservation. They can also be visited to study the food habits and behaviour of animals.
   Hence, we should visit botanical gardens, museums and zoos.

Find out (Textbook Page No. 4)

Question 1.
Human being is at key position in maintaining biodiversity of earth. Find out more information about the following.
i. Laws to protect and conserve biodiversity in India.
Answer:
a. Forest (Conservation) Act, 1980
b. Biological Diversity Act, 2002
c. Wildlife (Protection) Act, 1972
d. Environment Protection Act, 1986
[Students can find out more laws to protect and conserve Biodiversity in India]

ii. Environmental effects of ambitious projects like connecting rivers or connecting cities by constructing roads.
Answer:
Connecting rivers or connecting cities by constructing roads have the following environmental effects:
a. They form barriers to animals.
b. Construction of roads requires cutting down of trees and results in large scale deforestation.
c. They occupy large land resources resulting in loss of habitat of various species.
d. It can alter the water flow pattern and damage many ecosystems.
e. Increase in air, water, soil and noise pollution can disturb various animals and birds, thus affecting their behavioural pattern.

iii. Did bauxite mining in Western Ghats affect critically endangered species like – Black panther, different Ceropegia spp., Eriocaulon spp. ?
Answer:
a. The Western Ghats, is one of the global biodiversity hotspots and retains more than 30% of all plant, aquatic, reptile, amphibian and mammal species found in India.

b. Recently, this ecologically sensitive region has been subjected to various developmental activities that have adversely affected the flora and fauna of the region.

c. Bauxite mining is one such activity which has had significant negative impact on the local environment. To access bauxite ore deposits, the above-ground vegetation needs to be completely removed, causing large scale deforestation. The vegetation in the adjoining area is also affected due to dumping.

d. The major threats of this activity include vegetation loss, forest fragmentation and biodiversity loss.
e. Since most mines fall in Eco-Sensitive Zones (ESZ), it has seriously affected the flora and fauna of the Western Ghats.

f. Black panthers have frequently been spotted at various locations in the Western Ghats and mining in these areas can seriously affect their health and numbers.

g. Certain species of Ceropegia and Eriocaulon that are endemic in the area have been reported to be critically endangered.

[Source: Chandore A. (2015) Endemic and threatened flowering plants of Western Ghats with special reference to Konkan region of Maharashtra. Journal of Basic Sciences. 2 (21-25)]
Hence it is most likely that bauxite mining in Western Ghats has adversely affected the critically endangered species like – Black panther, different Ceropegia spp., Eriocaulon spp.

Internet my friend (Textbook Page No. 4)

Question 1.
i. Collect information about botanical gardens, zoological parks and biodiversity hotspots in India.
Answer:
a. Botanical gardens in India:

No.	Botanical Gardens of India	Location
1.	Acharya Jagadish Chandra Bose Indian Botanic Garden	Kolkata
2.	Lloyd Botanical Garden	Darjeeling
3.	National Botanical Research Institute	Lucknow
4.	Botanical Garden of the Forest Research Institute	Dehradun
5.	The State Botanical Garden	Odisha
6.	Botanical Garden	Saharanpur
7.	Government Botanical Garden	Ootacamund

b. Zoological Parks in India:

No.	Zoological parks	Location	Type of animals
1.	Rajiv Gandhi Zoological Park	Pune [Katraj]	Reptiles, mammals, birds. They have a snake park.
2.	Jijamata Udyan	Mumbai	Endangered species of animals and birds.
3.	Nehru Zoological Park	Hyderabad	3500 species of birds, animals and reptiles.
4.	Indira Gandhi Zoological Park	Vishakhapatanam	Primates, carnivores, small mammals, reptiles and birds.
5.	Padmja Naidu Himalayan Zoological Park	Darjeeling	Endangered animals like snow leopards, red pandas, gorals (mountain goat), Siberian tigers and a variety of endangered bird species.
6.	Allen Forest Zoo	Kanpur	Hyena, Bear, Rhinoceros, Hippopotamus, Langoor, Musk deer. Ostrich, Emu, Crane etc.
7.	Lucknow Zoo	Lucknow	Royal Bengal Tiger, White Tiger, Gibbon, Black Bear, Asiatic Elephant, Great pied, Horn Bill etc.
8.	Alipore Zoological Gardens	Kolkata	Royal Bengal Tiger, African Lion, Hippopotamus, Great Indian One-homed Rhinoceros.
9.	The Madras Crocodile Bank	Chennai	Crocodiles and many species of turtles, snakes and lizards.

	Trust		
10.	Parassinikkadavu Snake Park	Kannur	Spectacled Cobra, King Cobra, Russell's Viper, Krait and Pit Viper.

c. Biodiversity hotspots in India:

No.	Biodiversity Hotspots
1.	The Eastern Himalayas (Arunachal Pradesh, Bhutan, Eastern Nepal)
2.	Indo – Burma (Purvanchal Hills, Arakan Yoma, Eastern Bangladesh)
3.	The Western Ghats and Srilanka

ii. Collect information of endemic flora and fauna of India.
Answer:
a. Endemic flora:
Albizia sikharamensis (Mimosaceae), Argvreia arakuensis (Convolvulaceae), Arundinella setosa (Poaceae), Acacia diadenia (Mimosaceae), Citrus assamensis (Rutaceae), Magnolia bailloni (Magnoliaceae), etc.
[Source: http://www. bsienvis. nic. in/Database/E_3942. aspx]

b. Endemic fauna:
Bare Bellied Hedgehog (Paraechinus nudiventris), Andaman Shrew (Crocidura andamanensis), Aruanchal Macaque (Macaca munzala), Car Nicobar Rat (Rattus palmarum), Peter's Tube-nosed Bat (Harpiola grisea) etc.
[Source: http://faunaofindia.nic.in/PDFVolumes/spb/056/index.pdf]
[Students are expected to use the given sources and find more information on their own.]