

Answer Key

1st Section (05 points)

1. Describe the physiological and biochemical mechanisms developed by plants to cope with environmental constraints.

Plants respond to environmental stresses through several physiological and biochemical mechanisms such as:

- Modification of gene expression.
- Synthesis of protective proteins like Heat Shock Proteins (HSP) and LEA proteins.
- Reduction of water loss by thick cuticle, leaf rolling, and leaf hairs.
- Water storage in stems and roots.
- Production of abscisic acid (ABA) during water stress.
- Accumulation of solutes and antifreeze compounds.
- Salt exclusion or storage in vacuoles under salinity stress.
- Slowing metabolism or shedding leaves during cold conditions.

2. What are plant communities? Briefly explain their role in ecosystems.

Plant communities are groups of different plant species living and interacting together in the same habitat. They play important ecological roles by:

- Contributing to biodiversity.
- Participating in biogeochemical cycles.
- Regulating climate and water cycles.
- Protecting soil and maintaining ecosystem stability.
- Providing habitat and food for many organisms.

2nd Section (15 points)

Choose the correct answer for each question.

1. Which organisms are mainly responsible for recycling dead organic material in ecosystems?

- a) Consumers
- b) Herbivores
- c) Decomposers**
- d) Producers

2. Which factor is considered the principal determinant in the distribution of biomes?

- a) Geological transformations
 - b) Climate and other abiotic conditions**
 - c) Variations in the Earth's magnetic field
 - d) The number of animal species present
3. Which tree species is considered characteristic and ecologically important in tropical savannas?
- a) Baobab tree (*Adansonia digitata*)**
 - b) Apple tree
 - c) Cedar tree
 - d) Olive tree
4. What ecological interaction occurs when one species benefits while the other is neither harmed nor benefited?
- a) Predation
 - b) Mutualism
 - c) Commensalism**
 - d) Parasitism
5. Which feature is typical of tropical rainforest ecosystems?
- a) Very low annual precipitation
 - b) Cold temperatures throughout the year
 - c) Constant heat associated with high humidity**
 - d) Limited biodiversity
6. Which statement does NOT correspond to the characteristics of plants?
- a) Plants are multicellular eukaryotes
 - b) Plant cells generally contain chlorophyll pigments
 - c) Plants are capable of active locomotion**
 - d) Plant cells possess a large central vacuole
7. In Mediterranean shrub ecosystems, evergreen vegetation with hard leaves is commonly called:
- a) Halophytes
 - b) Sclerophyllous plants**
 - c) Hygrophytes
 - d) Bryophytes
8. Which activities are directly involved in the carbon cycle?
- a) Photosynthesis, combustion, and decomposition**
 - b) Evaporation, nitrification, and condensation
 - c) Erosion, sedimentation, and weathering
 - d) Transpiration, assimilation, and denitrification
9. Which type of vegetation dominates boreal forests?
- a) Tropical broadleaf trees
 - b) Coniferous species such as fir and pine**
 - c) Fruit trees such as banana and mango
 - d) Deciduous trees such as chestnut and beech

10. What is the role of temperature in plant development?

- a) It only influences leaf pigmentation
- b) It controls several metabolic functions such as photosynthesis and respiration**
- c) Its effect is restricted to cold seasons
- d) It has no influence on enzymatic reactions