

Chapter 13

Organisms and Populations

(Assertion Reason Questions)

Directions: In the following questions, a statement of assertion is followed by a statement of reason.

Mark the correct choice as:

- (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- (c) If Assertion is true but Reason is false.
- (d) If both Assertion and Reason are false.

Q.1. Assertion: Tropical rain forests are disappearing fast from developing countries such as India.

Reason: No value is attached to these forests because these are poor in biodiversity. [AIIMS 2015]

Q.2. Assertion: Flora contains the actual account of habitat and distribution of plants of a given area.

Reason: Flora helps in correct identification. [AIIMS 2016]

Q.3. Assertion: Species are groups of potentially interbreeding natural populations which are isolated from other such groups.

Reason: Distinctive morphological characters are displayed due to reproductive isolation. [AIIMS 2017]

Q.4. Assertion: “The Biological Species” concept helps us to ask how species are formed.

Reason: The concept of biological species focuses our attention on the question of how reproductive isolation comes about.

Q.5. Assertion: Cold deserts too exist. e.g., Tibet, Gobi.

Reason: Desert can be hot, e.g., Thar, Sahara.

Q.6. Assertion: Biotic community has higher position than population in ecological hierarchy.

Reason: Population of similar individuals remains isolated in the community.

Q.7. Assertion: Indo-Gangetic plains have high population density.

Reason: These have favourable climate and fertile soil.

Q.8. Assertion: Living organisms are regarded as open systems.

Reason: Energy of living organisms can be lost or gained from external environment.

Q.9. Assertion: Ecological equivalents possess similar types of adaptations.

Reason: Ecological niche is the total interaction of a species with environment.

Q.10. Assertion: Heliophytes, generally have low photosynthetic, respiratory and metabolic activities.

Reason: This is an adaptation of heliophytes to high intensity of light.

Q.11. Assertion: Leaf butterfly and stick insect show mimicry to dodge their enemies.

Reason: Mimicry is a method to acquire body colour blending with the surroundings. [AIIMS 2003]

Q.12. Assertion: Animals adopt different strategies to survive in hostile environment.

Reason: Praying mantis is green in colour which merges with plant foliage. [AIIMS 2004]

Q.13. Assertion: Thick cuticle is mostly present in disease resistant plants.

Reason: Disease causing agents cannot grow on cuticle and cannot invade the cuticle.

Q.14. Assertion: Daphnia populations in a water body, at different seasons of a year showed marked variations in their body morphology.

Reason: Cyclomorphosis in some organisms is influenced by the variations in temperatures prevailing in their water-bodies at different seasons

Q.15. Assertion: The prickly pear cactus introduced into Australia in early 1920s caused havoc by spreading rapidly into millions of hectares of land range.

Reason: When certain exotic species are introduced into a geographical area, they become invasive and start spreading fast because the invaded land does not have the natural predators.

-X-X-X-

ANSWER KEY

Q.1 : (c) Tropical rain forests have disappeared mainly due to man's activities. Due to over population in countries like India, rain forests are cut to make place available for man to live and build houses. To build buildings and factories man has incessantly cut down trees. This has caused the depletion of rain forests.

Q.2 : (b) Flora contains the actual account of habitat and distribution of plants of a given area. It provides the index to the plant species found in particular area.

Q.3 : (b) A group of individuals resembling each other in morphological, physiological, biochemical and behavioural characters constitute a species. Such individuals can breed among themselves but cannot breed with members other than their own to produce fertile offsprings. New species are formed mainly due to reproductive isolation.

Q.4 : (a) Ernst Mayr proposed the biological species concept, which defines species as groups of actually or potentially inter-breeding natural populations which are reproductively isolated from other such groups.

Q.5 : (b) Desert can be cold (e.g., Tibet, Gobi) and hot (e.g., Thar, Sahara). The true desert is a place that has a rainfall of less than 12 cm/ yr while in extreme desert is less than 7 cm/ yr.

Q.6 : (c) The organisms of all the species that live in a particular area and interact in various ways with one another form biotic community. Biotic community is a grouping that is higher than population. It is an assemblage of all the populations of different organisms occurring in an area. The different populations of a community do not remain isolated. They show interactions and inter-dependence.

Q.7 : (a) Soils of Indo-Gangetic plains and the Indus valley are highly fertile and suitable for agriculture, so these areas have high population density. Favourable climate increases population density of a geographical area because it favours increase in population growth. High soil fertility favours population density.

Q.8 : (d) Living organisms are regarded as open system as they can gain or lose energy from external environment. All living organisms restore their energy either directly from sunlight or indirectly from food.

Q.9 : (b) Organisms occupying similar ecological niches but living in different regions are called ecological equivalents. Ecological equivalents possess similar types of adaptations but belong to different taxonomic groups. For example; succulents of American deserts are cacti while those of African desert are euphorbias.

Q.10 : (d) Plants have special traits that help them to enlarge their tolerance limits to light regimes. Heliophytes are the sun adapted plants which are adapted to high intensity of light, and have higher temperature optima for photosynthesis, as well as have high rate of respiration. On the other hand, shade adapted plants also called as sciophytes generally have low photosynthetic, respiratory and metabolic activities. Plants such as ferns and several herbaceous plants growing on the ground under the dense canopy of trees, are shade tolerant plants.

Q.11 : (d) Leaf butterfly is green in colour and stick insect also mimics in order to escape from the enemies and also to catch prey. The camouflaging mechanism helps the organism to get adapted to its surroundings. The Leaf butterfly is seen more near the leaves while the stick insect camouflages with its surroundings by living on the branches.

Q.12 : (a) Animals blend with the surroundings or back ground to remain unnoticed for protection and aggression.

Q.13 : (a) Disease resistant plants possess thick cuticle. Infectious organisms can not grow or invade cuticle.

Q.14 : (a) In Daphnia the cyclomorphosis (cyclic change in morphology) is seen. The morphology depends upon the temperature variation in water. So at different seasons of the year the Daphnia shows different morphology.

Q.15 : (a) The introduction and spread of exotic plant and animal species in Australia has impacted on the environment, native biodiversity and local communities, transforming the landscape. The most widespread invasive weed in Queensland was a group of cactus species from the Americas, collectively known as prickly pear.