1. An ecosystem is a functional unit of nature where organisms interact with:
   A. Only other organisms
   B. Only physical environment
   C. Organisms and their physical environment
   D. Only plants (C)

Explanation : An ecosystem includes interactions among living organisms and between organisms and abiotic components of the environment.

2. The vertical distribution of different species occupying different layers in an ecosystem is called:
   A. Productivity B. Stratification
   C. Decomposition D. Succession (B)

Explanation : Stratification refers to the arrangement of species in different vertical layers, such as trees, shrubs and herbs in a forest.

3. The rate of production of organic matter by plants during photosynthesis is called:
   A. Secondary productivity
   B. Net productivity
   C. Gross primary productivity
   D. Decomposition (C)

Explanation : Gross primary productivity (GPP) is the total rate of organic matter production during photosynthesis.

4. Net primary productivity (NPP) is equal to:
   A. GPP + Respiration losses
   B. GPP – Respiration losses
   C. Respiration – GPP
   D. GPP × Respiration (B)

Explanation : NPP represents the biomass available for consumers after plants use some energy for respiration.
Formula: GPP – R = NPP

5. The raw material for decomposition in an ecosystem is:
   A. Humus B. Detritus
   C. Minerals D. Carbon dioxide (B)

Explanation : Dead plant and animal remains, including fallen leaves and fecal matter, form detritus, which is decomposed by decomposers.

6. The movement of energy in an ecosystem is:
   A. Cyclic
   B. Bidirectional
   C. Unidirectional
   D. Random (C)

Explanation : Energy flows from the sun → producers → consumers and is finally lost as heat.

7. According to the 10% law, energy transferred from one trophic level to the next is approximately:
   A. 1% B. 10%
   C. 50% D. 90% (B)

Explanation : Only about 10% of energy is transferred to the next trophic level; the rest is lost mainly as heat.

8. Organisms present at the first trophic level are:
   A. Herbivores
   B. Carnivores
   C. Producers
   D. Decomposers (C)

Explanation : Producers (plants and photosynthetic organisms) form the first trophic level by capturing solar energy.

9. Which ecological pyramid is always upright and can never be inverted?
   A. Pyramid of numbers
   B. Pyramid of biomass
   C. Pyramid of energy
   D. Pyramid of organisms (C)

Explanation : Energy decreases at every trophic level due to heat loss, therefore the pyramid of energy is always upright.

10. The pyramid of biomass is generally inverted in:
    A. Grassland ecosystem
    B. Forest ecosystem
    C. Aquatic ecosystem
    D. Desert ecosystem (C)

Explanation : In aquatic ecosystems, phytoplankton have low standing biomass but support larger biomass of zooplankton and fishes, producing an inverted biomass pyramid.