

Topic :- Ecosystem

- 1 **(a)**
Vertical distribution of different species occupying different levels is called stratification, *e.g.*, in a forest ecosystem, trees occupy top vertical strata or layer, shrubs the second and herbs and grasses occupy the bottom layers
- 2 **(b)**
Phytoplankton → Submerged plant stage A → Submerged free floating plant stage B → Reed swamp stage C → Marsh-meadow stage → Scrub stage D → Forest plant stage
- 3 **(d)**
Pioneer community is the 1st biotic community, which develops in barren area. Pioneer community is established over a previously bare area
- 4 **(a)**
Plant can utilise 1% (0.01) of total incident radiation green all plant utilises 1-2% of total incident radiation sugar can is the most efficient crop which utilises the 5% of total incident radiation into photosynthetic product
- 5 **(d)**
2-10%.
Out of the total incident solar radiation, only 50% of it is Photosynthetically Active Radiation (PAR). Plants capture only 2-10% of the PAR and this small amount of energy sustains the entire living world
- 6 **(d)**
Homeostasis or state of equilibrium or balance of nature is maintained through a number of controls like carrying capacity self regulation and feedback system

- 7 **(d)**
Trophic levels are the divisions or levels of food chain characterized by specific method of obtaining food (and energy).
- 8 **(a)**
Sulphur cycle.
In sedimentary cycle, the main reservoirs are soil and rocks, *e.g.*, sulphur cycle, phosphorus cycle, etc.
- 9 **(c)**
The successive development of different biotic communities at the same site till a climax community develops there, is called ecological succession (Hutt; 1885). The species that invade a bare area are called **pioneer species**. In primary succession on rocks (xerarch succession) these are usually lichens which are able to secrete acids (lichenic acid) to dissolve rock, helping in weathering and soil formation. These later pave way to some very small plants like bryophytes (*e.g.*, Mosses) which are able to take hold in the small amount of soil.
- Secondary succession or subseres is a biotic succession on a secondarily bare area, *e.g.*, burned forests, area after deforestation. It takes 50-100 years (for grassland) and 100-200 years (for forest). Ferns are generally the first to grow after the forest fire because of their underground rhizomes.
- 10 **(b)**
An ecosystem, which is created and maintained by human beings, is called artificial or man-made ecosystem. Some examples of man-made ecosystem are aquarium, garden, agriculture, apiary, poultry, piggery etc.
- 11 **(c)**
PAR – Photosynthetically Active Radiation. The sum is the only source of energy for all ecosystems on earth. Out of the total incident solar radiation, only 50% of it is

photosynthetically Active Radiation (PAR)
Plants capture only 2-10% of the PAR and this small amount of energy sustains the entire living world. So, there is unidirectional flow of energy from the sun to producers and then to consumer

12 (c)

The sunlight directly regulates the primary productivity because the plants perform photosynthesis with the help of sunlight. The amount of biomass or organic matter produced per unit area over a time period in plants during photosynthesis is called primary production

13 (c)

The nutrient reservoir meets the deficit arising due to imbalance in the rate of influx and efflux of nutrient

14 (b)

Gause's hypothesis was restated by Hardin (1960) as the competitive exclusion principle which in its simplest form states that "complete competitors cannot coexist". Both having the same needs to survive work as competitors. Most populations are regulated by competition, primarily for food.

15 (b)

According to **Odum** (1983), ecosystem has six components, in which abiotic components almost similar in every ecosystem.

(i) **Abiotic components**

(a) **Inorganic substances**

C, N, S, K, CO₂, H₂O, temperature, humidity, soil light, pressure, etc.

(b) **Organic substances**

Proteins, carbohydrates, lipids, etc.

(ii) **Biotic components**

Producers, macroconsumers, microconsumers.

16 (c)

The transfer of energy from producers to top consumers through a series of organisms is called food chain. It is always straight and proceed in a progressive straight line. In a food chain, the maximum population is of producers

17 (c)

Producers → Primary consumers → Secondary consumers

(Grain) (Chicken) (Man)

18 (a)

Pyramid of energy is never inverted because in each ecosystem producers are green plants, which prepare their own food in the process of photosynthesis and thus, trap maximum solar energy. In herbivores, only 10% of energy of plants transfer and rest 90% is itself used by the plants and some loss as heat. Further, primary carnivores take only 10% of energy from herbivores, i.e., 1% of plants. In this way, energy percentage becomes reduced in next higher trophic levels. This 10% flow of energy from one trophic level to the next is called 10 percent law of Lindemann.

19 (d)

Biomes are climatically and geographically defined as similar climatic conditions on the earth, such as communities of plants, animals and soil organisms. A biome has a certain set of characteristics. There are seven kinds of biomes in the world-tundra, taiga, temperate forests, deserts, grassland and ocean.

20 (a)

Pyramid of number is a graphic representation of the number of individuals per unit area of various trophic levels stepwise with producers being kept at the base and top carnivores kept at the top. In most cases, the pyramid of number is upright with members of successive higher trophic level being fewer than the previous one. The maximum number of individuals occur at the **producer level**.

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	A	B	D	A	D	D	D	A	C	B
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	C	C	B	B	C	C	A	D	A

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