

Topic :- Organisms & Populations

- 1 **(a)**
Biotic potential is the inherent capability of an organism to reproduce and increase in number under ideal conditions.
- 2 **(b)**
Ecology is the study of interaction between living organisms and their environment. The basic unit of study in ecology is organism.
- 3 **(c)**
Body compensates low oxygen availability at high altitude by increasing RBC production, increasing binding capacity of haemoglobin (through increasing 2, 3-biphosphoglyceric acid) and increasing breathing rate
- 4 **(b)**
Within biological communities, some species may be important in determining the ability of large number of other species to persist in the community. These crucial species have been termed keystone species. These have often considerably low abundance and biomass as compared to dominant species but their removal or decrease in number causes serious disruption in the functions of community, e.g., top predators, grey wolves in grasslands, etc.
- 5 **(b)**
The increase in number of individuals in particular time period is termed as 'birth rate' or 'natality', while the individuals dying over a time period is known as 'mortality' or 'death rate'.
Birth rate = 100
Death rate = 10
Number of individuals in a population = 1000
Natural growth rate = $100 - 10 = 90$

So, percentage of growth rate = $\frac{90}{1000} \times 100 = 9\%$.

6 **(b)**

A₀ region is just below the O₁ region in soil, in which decomposition has begun. Thus, organic matter is found under different stages of decomposition and microorganisms like bacteria, fungi, Actinomycetes are frequently found. The decomposed matter is called **humus**.

7 **(a)**

A-Narrow; B-100°C

8 **(c)**

Age pyramid Graphic representation of different age groups found in a population with pre-reproductive group at the base. Reproductive ones in the middle and post-reproductive group at the top is called age pyramid.

Age pyramid have three kinds

(i) **Triangular Age Pyramid** The number of pre-reproductive is very large. Number of reproductive individual is moderate and post-reproductive are fewer. Population size is growing

(ii) **Bell-shaped Age Pyramid** The number of prereproductive and reproductive individuals is almost equal. Post-reproductive individuals are comparatively fewer. Population size is stable

(iii) **Urn-shaped Age Pyramid** Proportion of reproductive age group is higher than the individuals in pre-reproductive age group. Number of post-reproductive individuals is also sizable. It is declining population with negative growth

9 **(c)**

Competition occurs for same limited resources between closely related or unrelated species. It is generally believed that competition occurs when closely related species compete for same resources that are limiting. But this is not true unrelated species also compete for same resources. This is called interspecific competition which proves to be the potent force in organic evolution

10 **(d)**

Non-hibernating mammal living in cold climatic would have the high respiration rate. As the temperature goes on increasing the respiration also goes on increasing but up to the certain limit. Beyond that limit the respiration goes on decreasing

- 11 **(a)**
Given statement are the adaptation through which prey can avoid their predators. Mimicry, camouflage and poisonous are the different strategies to avoid predators
- 12 **(a)**
The organic matter in soil is humus which is rich in N, P, K. Three distinct layers of humus in soil are litter (dead fresh organic matter), duff (partially decomposed litter) and real humus.
- 13 **(b)**
Some organisms show behavioural adaptation to cope with variation in environment. Desert lizards lack the physiological ability to deal with high temperature. They keep their body temperature fairly constant by behavioural means. They enjoy in sun and absorb heat when their body temperature is low. When their body temperature starts increasing it moves into shades
- 14 **(a)**
Desert lizard lack the physiological condition to deal with high temperature of their habitat, but manage to keep their body temperature fairly constant by behavioural means
- 15 **(b)**
Lichens represents an intimate mutualistic relation between a fungus and photosynthetic algae or cyanobacteria. It is the interaction confers benefit for both the interacting species called mutualism
- 16 **(d)**
The science dealing with study of soil is called edaphology or Paedology or Pedology
- 17 **(a)**
Biological control method in agriculture pest control based on the predator prey relationship. The prickly pear cactus introduced into Australia

in 1920's caused Havoc by spreading rapidly into million of hactares of range land. Finally invasive cactus was brought under control only after a cactus-feeding predator (a moth) from its natural habitat was introduced into the country

18 **(d)**

Exponential Growth Model When the resources availability is unlimited in the habitat, the population grows in an exponential or geometric fashion. As resources are unlimited than there is no inhibition from crowding.

The equation is; $dN/dt = (b - d) \times N$ [b = Birth rate, d = Death rate

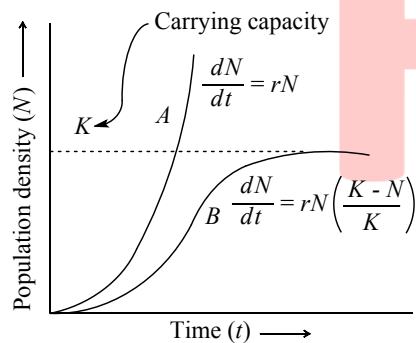
N = Population density, $\frac{dn}{dt}$ = Rate of change of population

Let $(b-d) = r$, then the equation is, $dN/dt = Rn$

r = Intrinsic rate of natural increase

When a population shows exponential growth, the curve plotted with N in relation to time, assume J shape

In this there is no fix carrying capacity



19 **(a)**

Interpretation (a) is correct.

20 **(b)**

Viscum album is a partial stem parasite that grows on , poplar, apple, walnut, oak, etc. The parasite sends primary haustorium into the host for sucking food.

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

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