DPP
DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

Subject : BIOLOGY
DPP No. : 10

Topic :- Organisms & Popoulations

1 **(a)**
When two related populations occupy geographically or spatially separate areas, they are called **allopatric population**.

2 **(d)**
Exponential phase or log phase is characterised by rapid growth in population, which continues till enough food is available.

3 **(a)**
$$\frac{dN}{dt} = (b - d)N$$
$$\frac{dN}{dt} = (65 - 45)100$$
$$\frac{dN}{dt} = (20 \times 100)$$
$$\frac{dN}{dt} = 2000$$

4 **(d)**
All of these.
The interspecific interaction arise from the interaction of population of two different species. They could be beneficial, detrimental or neutral to one of the species or both

5 **(d)**
A population of frog protected from all predator would not increase indefinitely because nature's resources are limited. Beyond a carrying capacity the population would not increase because it is the maximum number of population which can be sustained by the habitat

6 **(a)**
In amensalism, one component (population) is harmed and the other remains unaffected. The alga *Microcystis* release hydroxyl amine that kills the surrounding fauna but the alga itself remains

unaffected.

7 **(a)**

A-Carrying capacity; B-Decreases

8 **(a)**

Average weather.

Differences between weather and climate

Weather	Climate
It is a short term property of the atmosphere.	It is the long term property of the atmosphere. It is average weather.
Weather changes from place to place.	Climate is same over larger area.
Weather changes have little impact on flora and fauna of a place.	Climate determines the flora and fauna of a place.
Changes in weather occur from time to time	Climate remains the same over a long period of time

9 **(d)**

Individual (organisms) It is a distinct living entity having all life processes in its body separate from those in other individuals. Individual organism is the basic unit of ecological hierarchy as it continuously exchange material and information with its environment

10 **(a)**

A-Expanding, B-Stable, C-Declining.

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

11 **(b)**

Exponential growth curve is also called J-shaped curve or geometric growth curve.

Logistic curve is also called sigmoid growth curve J-shaped curve.

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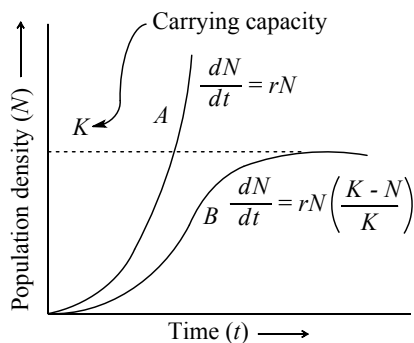
The equation is; $dN/dt = (b - d) \times N$ [$b =$ Birth rate, $d =$ Death rate

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

Let $(b\text{-}d) = r$, 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

Logistic Growth Model No population can continue to grow exponentially, as the resource availability become limiting at certain point of time. Logistic growth model have fixed carrying capacity

It is described by the equation $\frac{dN}{dt} = rN\left(\frac{K - N}{K}\right)$
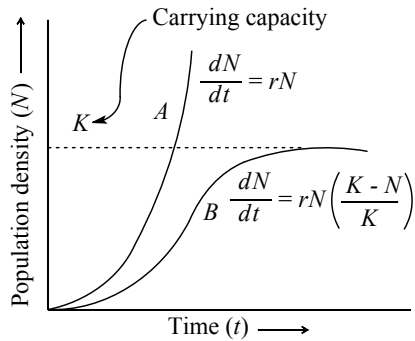
Rate of change of population density

N = Population density at time

N = Population density

r = Intrinsic rate of natural increase

K = Carrying capacity

Population growth curve A when resources are not limiting. Plot is exponential or geometrical curve B. When resources are limiting the growth, plot is logistic

'K' is carrying capacity

12 **(a)**

Population is the total number of interbreeding individuals of a species found in a particular area who share and compete for similar resources

13 **(b)**

Ecotype is the genetically distinct adapted population to a particular habitat of a species in different geographical area shows some difference in morphological but can interbreed

14 **(b)**

A-Zooplankton, B-Need not be, C-Reduced

15 **(d)**

The amount of living matter present in an ecosystem in its different topics level is called standing crop. It is expressed in the form of number or biomass is measured as either fresh weight or dry weight.

16 **(b)**

The term niche was used in ecology by Grinnel for the role of species/population plays in its ecosystem. Ecological niche means the total interaction of a species with environment.

17 **(a)**

Competition Rivalary between two or more

organisms for obtaining the same resources. Competition is of two types *e.g.*, intraspecific and interspecific

Differences between Intraspecific and Interspecific Competition

Intraspecific Competition	Interspecific Competition
It is competition among individuals of the same species.	The competition is amongst the members of different species.
The competition is for all the requirements	The competition is for one or a few requirements.
The competing individuals have similar type of adaptation.	The competing individuals have different types of adaptations.
It is more severe due to similar needs and adaptations.	It is less severe as the similar needs are a few and the adaptations are different.

18 **(c)**

Instant Pathogens Newly developed pathogens are more damaging as the host have not yet developed adaptation to negative interaction, *e.g.*, SARS

19 **(a)**
$$\frac{dN}{dt} = rN$$
$$\frac{dN}{dt} = 0.01 \times 300$$
$$\frac{dN}{dt} = 3$$

20 **(c)**

Commensalism is an association or relationship between two different organisms, in which one is always benefitted. While the other is neither benefitted nor harmed, e.g., small sucker fish with large shark.

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

PE