

### Topic :- Organisms & Populations

- 1 (b)  
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

- 2 (a)  
**Gloger's Rule** In warm-blooded animals, including humans, pigmentation is little in colder areas, yellow brown to red in arid climates and black in humid hot areas

- 3 (b)  
A population having large number of young individuals will show rapid increase in population. It is called positive growth

- 4 (b)  
Depending on the nature of transporting agents, the transported soil may be
- (i) **Glacial** Transported by glaciers (large mass of snow ice.)
  - (ii) **Eolian** Transported by wind
  - (iii) **Alluvial** Transported by running water
  - (iv) **Colluvial** Transported by gravity.

- 5 (b)  
A population with large number of post-

reproductive or older individuals and lesser number of pre-reproductive individuals will show a negative growth rate or decline growth.

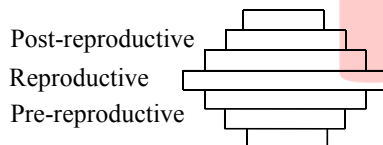
**Age pyramid** Graphic representation of different age groups found in a population with pre-reproductive group at the base. Reproductive ones in the middle and post-reproductive group at the top is called age pyramid.

*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



6 (a) Human liver fluke depend upon two intermediate host-a snail and pig to complete its life cycle

7 (c) Cactus feeding predator.  
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

8 (a) The zone extends between 45° to 66° in northern and 45° to 66° in southern hemisphere is called **temprate zone**.

- 9 **(a)**  
Population is group of similar individuals in a particular geographical area which share or compete for similar resources, potentially interbreed. Different populations of the same organism present in a particular geographical areas are called local population or domes
- 10 **(b)**  
Ecological hierarchy or ecological levels or organisation.  
Organisation is the arrangement and coordination of small components into larger components in a hierarchy, where each level is formed of components of lower level and itself becomes constituent of still higher level  
Hierarchy in a organisation from the level of biomolecules to organismic level is called biological hierarchy or biological organisation.  
The hierarchy in the levels of organisation connected with ecological grouping of organism is called ecological hierarchy or ecological level of organisation  
There are no sharp lines or breeks in the functional sense amongst various level of ecological hierarchy as the same individual is a components of population, biological community as well as ecosystem
- 11 **(b)**  
In India, population is heavily weighed towards the younger age groups due to short life span and high birth rate.
- 12 **(b)**  
Hydrophytes.  
Plants of aquatic habitat is called the hydrophytes. Hydrophytes possess aerenchyma or air storing parenchyma to support themself in water
- 13 **(b)**  
Osmotic problems.  
Some organisms are tolerant to wide range of salinities called euryhaline, *e.g.*, salmon fish but others are restricted to narrow range called stenohaline like shark and string rays. Many freshwater animals cannot live for long in sea

water and *vice-versa* because of the osmotic problems they would face

14 **(b)**

$$dN/dt = (b - d) \times N.$$

**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

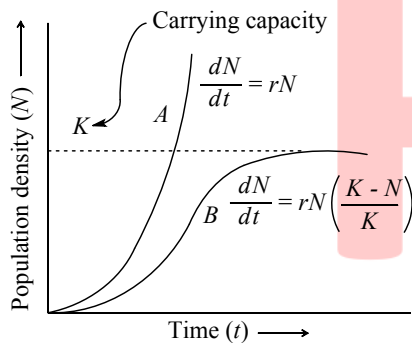
$N$  = Population density,  $\frac{dn}{dt}$  = Rate of change of population

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



15 **(d)**

Predators also help in maintaining species diversity in a community by reducing the intensity of competition among competing prey species. Predator can also be used for biological control of weeds and pests

16 **(a)**

A-Herbivores, B-Predators

17 **(c)**

**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  $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$

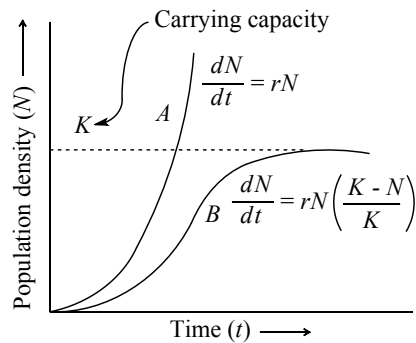
Rate of change of population density

$N$  = 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

18 (c)

Niche is the specific physical space occupied by an organism and the functional role of organism in the ecosystem. Thus, an organism's niche is defined by the types of food it consumes, its predators, temperature, tolerance, etc.

19 (b)

Geometric representation of age structure is a characteristic of population. In most populations, individuals are of different ages. The proportion of individuals in each age group is called age structure of that population.

20 (b)

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

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

**PE**