

Organisms and Populations Important Questions With Answers

NEET Biology 2023

1. In which one of the following is nitrogen not a constituent?
a) Pepsin **b) Idioblast** c) Bacteriochlorophyll d) Invertase

Solution : -

Raphides are needle-shaped crystals of calcium oxalate found in specialized plant cells known as idioblasts. It is believed that the raphides are defense mechanism against plant predators.

2. A biologist studied the population of rats in a barn. He found that the average natality was 250, average mortality 240, immigration 20 and emigration 30. The net increase in population is _____.
a) 15 b) 05 **c) Zero** d) 10

Solution : -

A population has birth rates and death rates. The net increase in a population can be represented by: Birth rate (B) + Immigration (I) - Death rate (D) + Emigration (E) $(250 + 20) - (240 + 30)$ i.e. $270 - 270 = 0$.

3. Which of the following options exemplifies a behavioural means of homeostasis?
a) A man sweating profusely in a hot room b) A rhino covering itself in mud to keep cool
c) A desert lizard basking in Sun to increase its body temperature **d) Both (b) and (c)**

Solution : -

Some organisms show behavioural adaptations to cope with variations in their environment. A rhino covering itself in mud to keep cool and desert lizard basking in Sun to keep warm are examples of behavioural means of homeostasis

4. In an ecosystem the function of the producers is to
a) Convert organic compounds into inorganic compounds
b) Trap solar energy and convert it into chemical energy c) Utilize chemical energy d) Release energy

5. Which of the following is the main factor of water pollution -
a) Smoke **b) Industrial waste** c) Detergent d) Ammonia

6. An interaction between two individuals where one is benefitted while the other is neither benefitted nor harmed is called as
a) predation b) symbiosis c) amensalism **d) commensalism.**

Solution : -

When two or more animals live together and if there is no physiological dependence between them, they are referred to as commensals and the relationship between such organisms is called commensalism. In commensalism, one animal might get the benefit from the association while the other is neither benefitted nor harmed. The advantages derived by the commensal involve the provision of substratum, shelter, transport and food.

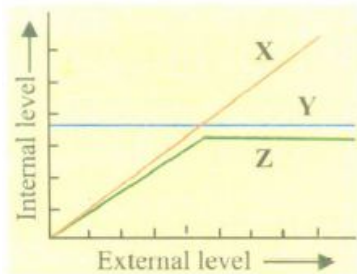
7. Read the following statements and select the correct option.

Statement 1 : The prickly pear cactus introduced into Australia in early 1920s caused havoc by spreading rapidly into millions of hectares of rangeland.

Statement 2 : When certain exotic species are introduced into a geographical area, they become invasive and start spreading fast because the invaded land does not have its natural predators

- a) **Both statements 1 and 2 are correct.** b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct d) Both statements 1 and 2 are incorrect

8. The given graph represents how three different living organisms (X, Y and Z) cope with the external environmental conditions. Study the graph and select the correct option regarding X, Y and Z.



- a) X could be a mammal **b) Y could be a bird** c) Z could be a mammal d) X could be a bird

Solution : -

(i) Conformers - These are the animals and plants in which the osmotic concentration and temperature of body changes according to ambient conditions of external environment e.g., Asterias.

(ii) Regulators - These are able to maintain a constant body temperature and constant osmotic concentration despite changes in the external environment e.g., birds and mammals.

(iii) Partial regulators - They have the ability to regulate body functions to a limited extent beyond which they become conformers.

9. Salt concentration (salinity) of the sea measured in parts per thousand is

- a) 10-5 b) 30-70 c) 0-5 **d) 30-35.**

Solution : -

Salinity of water bodies is generally measured in parts per thousand. It determines what kind of organisms can live in it. Salinity of the sea is 30-35 parts per thousand, while for inland waters and some lagoons is less than 5 and more than 100, respectively. Freshwater animals generally cannot live for long in sea water and **vice versa** because of osmotic problems.

10. Assertion : Elimination of a competitively inferior species in a closely related or otherwise similar group is known as competitive exclusion principle.

Reason: If two species compete for the same resource, they could avoid competition by choosing different times for feeding or different foraging patterns.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

Solution : -

Gause's 'Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot co-exist indefinitely and the competitively inferior one is eliminated eventually. This may be true if resources are limiting, but not otherwise. Mechanism of 'Resource partitioning' states that if two species compete for the same resource, they could avoid competition by choosing, for instance, different times for feeding or different foraging patterns.

11. The equation for J-shaped population growth curve is:

a) $\frac{dN}{dt} = rN$ b) $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$ c) $N_t = N_0 + B + I - D - E$ d) $D = \frac{N}{S}$

12. Earliest settlers on barren lands or the farmers of nature are

- a) Diatoms **b) Lichens** c) Moss & grasses d) Ferns

13. Read the following statements and select the correct option.

Statement 1 : Plants need the help of insects and animals for pollinating their flowers and dispersing their seeds.
Statement 2 : Plants offer rewards in the form of pollen and nectar for pollinators and juicy and nutritious fruits for seed dispersers.

- a) Both statements 1 and 2 are correct.** b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct d) Both statements 1 and 2 are incorrect

Solution : -

Plants themselves cannot move from one place to another. Hence, they require help of insects to transfer pollen. In turn, they offer nectar and juicy fruits to the insects.

14. In the formula $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$, $\left(\frac{K-N}{K}\right)$ stands for

- a) Environmental resistance** b) Reproductive potential c) Growth rate d) Carrying capacity

15. Read the given examples of animal interactions.

- (i) An orchid growing as an epiphyte on a mango branch.
(ii) Barnacles growing on the back of a whale.
(iii) Clown fish living among the stinging tentacles of sea anemone.
(iv) Cattle egrets foraging close to the grazing cattle. Which kind of interaction is being cited by these?
a) Competition b) Amensalism c) Mutualism **d) Commensalism**

Solution : -

When two or more animals live together and if there is no physiological dependence between them, they are referred to as commensals and the relationship between such organisms is called commensalism. In commensalism, one animal might get the benefit from the association while the other is neither benefitted nor harmed. The advantages derived by the commensal involve the provision of substratum, shelter, transport and food.

16. Ecology is basically concerned with how many levels of biological organisation?

- a) Three **b) Four** c) Two d) Five

17. What is a keystone species?

a)

A species which makes up only a small proportion of the total biomass of a community yet has a huge impact on the community's organization and survival.

- b) A common species that has plenty of biomass, yet has a fairly low impact on the community's organisation.
c) A rare species that has minimal impact on the biomass and on other species in the community.
d) A dominant species that constitutes a large proportion of the biomass and which affects many other species.

Solution : -

A keystone species is the one which makes up only a small proportion of the total biomass of a community yet has a great impact on the community's organization and survival.

18. A large regional unit characterised by a specific flora and fauna is called

- a) Biome** b) Biosphere c) Ecosystem d) Landscape

19. Study of interrelationships between living organisms and their environment is _____.

- a) Ecology** b) Ecosystem c) Phytogeography d) Ethology

Solution : -

Study of interrelationship between living organisms and their environment is called as Ecology. Ecology may be called environmental biology.

20. Natality refers to:

- a) Number of individuals leaving the habitat **b) Birth rate** c) Death rate
d) Number of individuals entering a habitat

Solution : -

Natality refers to birth rate. Number of individuals entering a habitat is immigration. Death rate is known as mortality. Number of individuals exiting a habitat is known as emigration.

21. Which one of the following pairs is mismatched?

- a) Tundra - permafrost** b) Savanna - acacia trees c) Prairie - epiphytes
d) Coniferous forest - evergreen trees

Solution : -

In coniferous forest, all plants do not shed their leaves at the same time hence forest remains ever green. Prairies is a grass land and epiphytes and ephemerals are found in desert. The Acacia trees are common in African savannas.

22. Population ecology is an important area because it (i) ecology to population genetics and (ii). Identify (i) and (ii) in the above statement and select the correct option.

a)	b)	c)	d)
(i) (ii)	(i) (ii)	(i) (ii)	(i) (ii)
distinguishes evolution	distinguishes biogenesis	links evolution	links biogenesis

23. The science dealing with soil is called -

- a) Pedology** b) Acarology c) Geology d) Palaeontology

24. Two species competing for the same resource can avoid competition by choosing different habits. This phenomenon is called _____ and was supported by _____.

- a) competitive exclusion, Gause b) competitive exclusion, MacArthur c) resource partitioning, Gause

d) resource partitioning, MacArthur

Solution : -

According to the mechanism of resource partitioning (supported by MacArthur), if two species compete for the same resource, they could avoid competition by choosing, for instance, different times for feeding or different foraging patterns. Two species evolve to become different to reduce competition, so that both species can co-exist

25. Consider the following statements (i) - (iv) each having one or two blanks

- (i) Bears go into (1) during winter to (2) cold weather.
(ii) A conical pyramid with a broad base represents (3) human population.
(iii) A wasp pollinating a fig flower is an example of
(iv) An area with high level of species richness is known as (5).

- a) (3) - expanding, (4) - commensalism (5) - biodiversity park
b) (1) - hibernation, (2) - escape, (3) - expanding, (5) - mutualism
c) (3) - stable, (4) - commensalism (5) - marsh d) (1) - aestivation, (2) - escape, (3) - stable, (5) - mutualism

Solution : -

Fact.

26. Pollution can be controlled by -

- a) Sewage treatment b) Checking atomic blasts c) Manufacturing electrically operated vehicles
d) All the above

27. Refer to the given table. If '+' sign has been assigned for beneficial interaction, '-' sign for detrimental interaction and '0' for neutral interaction, identify the type of interaction (i), (ii) and (iii) and select the correct option.

Species A	Species B	Type of interaction
-	-	(i)
+	-	(ii)
+	0	(iii)

a)

(i)	(ii)	(iii)
Predation	Parasitism	Amensalism

b)

(i)	(ii)	(iii)
Competition	Predation	Commensalism

c)

(i)	(ii)	(iii)
Competition	Parasitism	Commensalism

d) Both (b) and (c)

Solution : -

In competition, both species are harmed. In predation and parasitism, one species derives benefit and the other one is harmed. Commensalism is an interaction in which one species is benefitted and other one remains unaffected.

28. Stable plant community formed during succession is called -

a) Sere community **b) Climax community** c) Dominant community d) Ecotone

29. An urn shaped population age pyramid represents

a) growing population b) static population **c) declining population** d) extinct population

30. The semilog of per minute growing bacteria is plotted against time. What will be the shape of graph?

a) Sigmoid b) Hyperbolic **c) Ascending straight line** d) Descending straight line

Solution : -

Semilog of per minute growing bacterium when plotted against time, would yield ascending straight line.

31. In a life table, the number of individuals alive at the beginning of the 1st year to 2nd year interval is 800. During this interval, 200 individuals die. The death rate for this interval is

a) 0.25 b) 200 c) 800 d) 0.2

Solution : -

$$\text{Death rate} = \frac{\text{Number of deaths}}{\text{Initial number of individuals}}$$

$$= \frac{200}{800} = \frac{1}{4} = 0.25$$

32. Ice fish and Antarctic fish remain active in extremely cold water due to:

a) development of thick layer of sub-cutaneous fat b) development of extra solute in body fluids
c) development of ice nucleating protein in extra cellular spaces **d) both (b) and (c)**

Solution : -

Ice fish or Antarctic fish remains active even in extremely cold sea water due to cold hardiness. Cold hardiness is achieved by developing extra solutes in the body fluids and special ice nucleating proteins in the extracellular spaces. The extra solutes which prevent freezing are glycerol and antifreeze proteins. They lower the freezing point of body fluids.

33. In which one of the following habitats does the diurnal temperature of soil surface vary most?

a) Shrub land b) Forest **c) Desert** d) Grassland

Solution : -

Desert show maximum difference between day and night temperature.

34. In a growing population of a country.

- a) reproductive and pre-reproductive individuals are equal in number.
- b) reproductive individuals are less than the post reproductive individuals.
- c) pre-reproductive individuals are more than the reproductive individuals.**
- d) pre-reproductive individuals are less than the reproductive individuals.

Solution : -

In a growing population of a country pre, reproductive individuals are more than reproductive individuals. This type of population is represented by a triangular-shaped age pyramid. When reproductive and pre-reproductive individuals are equal in number, it indicates stable population which is represented by a bell-shaped age pyramid. The population in which pre-reproductive individuals are less in number than reproductive individuals then it is a declining population and age pyramid is urn-shaped. When reproductive individuals are less than post-reproductive individuals similar results are found.

35. Size of clay particles is
a) Between 0.00002-0.02 mm b) Less than 0.002 mm c) 0.5-1.0 mm d) 0.02-0.2 mm
36. Majority of plants belongs to which of the following category
 a) Regulators **b) Conformers** c) Partial regulators d) More than one correct
37. The maximum energy is stored at which of the following tropical level in any ecosystem -
a) Producers b) Herbivores c) Carnivores d) Top carnivores
38. The formula for exponential population growth is _____.
 a) $dN/rN = dr$ b) $rN/dN = dt$ **c) $dN/dt = rN$** d) $dt/dN = rN$

Solution : -

The formula of exponential growth is $dN/dt = rN$ where dN/dt is the rate of change in population size, r is the biotic potential and N is the population size.

39. The concept that population tends to increase geometrically while food supply increases arithmetically was put forward by _____.
 a) Stuart Mill b) Adam Smith c) Charles Darwin **d) Thomas Malthus**

Solution : -

Malthus in his 'Essay on the principle of population' (1798), pointed out that population tends to increase in geometric progression while food supply increases only in arithmetic progression.

40. Two different species cannot live for long duration in the same niche or habitat. This law is called
 a) Allen's law b) Gloger rule **c) Competitive exclusion principle** d) Weisman's theory

Solution : -

Refer to answer 119

41. If the age distribution is plotted for a population, the resulting structure is called as:
 a) age graph b) age curve **c) age pyramid** d) age diagram.

Solution : -

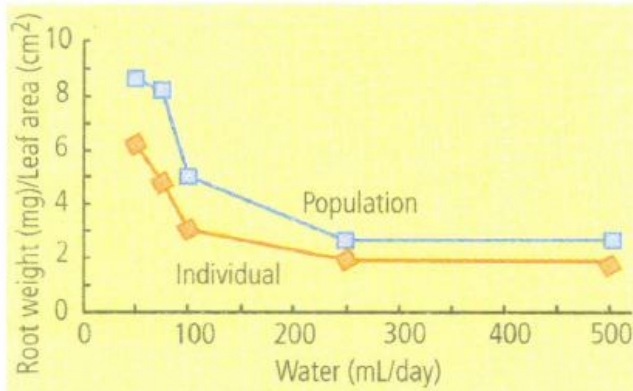
Age distribution is percentage of individuals of a given age or age group. A population at any given time is composed of individuals of different ages. If age distribution is plotted for the population, the resulting structure is called as age pyramid.

42. Diffuse porous woods are characteristic of plants growing in _____.
a) tropics b) alpine region c) cold winter regions d) temperate climate

Solution : -

Diffused porous wood have vessels arranged irregularly within the wood. In tropics, there is no very difference between the seasons; thus there is not much difference in the activity of cambium.

43. To determine the effect of intra-specific competition on the growth of saplings of *Eucalyptus dives*, an experiment was designed in which two sets of pots were used. In the first set only 1 sapling was planted per pot and in the other set 16 saplings were planted per pot. To check for the effect of intra-specific competition on allocation of resources, a decreasing amount of water was added to each set. The results have been graphically indicated below. Which of the following conclusions can be best drawn from the study?



- a) More resources are allocated to the root during low water conditions
 b) **Competition for water among individuals of a population causes more root growth as compared to individuals who are growing alone.**
 c) Lesser leaves are formed under low water conditions
 d) Root growth is higher in individuals grown singly as compared to individuals in populations.

Solution : -

Competition is a sort of rivalry among two or more organisms for obtaining the same resources. The competition among individuals of the same species is called intraspecific competition and among members of different species is called interspecific competition. Intraspecific competition is more severe than interspecific competition due to similar needs. Now, according to the given graph, competition for water in a population leads to more root weight (mg) per leaf area (cm²). This is because competition causes more root growth so that each sapling can derive more water from the pot.

44. Artificial selection to obtain cows yielding higher milk output represents : _____.

- a) **Directional as it pushes the mean of the character in one direction.**
 b) as it splits the population into two, one yielding higher output and the other lower output.
 c) Stabilizing followed by disruptive as it stabilizes the population to produce higher yielding cows.
 d) Stabilizing selection as it stabilizes this character in the population.

Solution : -

Artificial selection to obtain cows yielding high milk output represents directional selection as it pushes the mean of the character in one direction. In directional selection a particular phenotypic character in one population is selected in one direction. In this artificial selection, it is intentionally performed to increase the yield of milk, directional selection operations.

45. Which of the following is a man made artificial ecosystem:

- a) Grassland ecosystem b) Forest ecosystem **c) Ecosystem of artificial lakes & dams**
 d) None of these

46. Gross primary productivity is -

- a) Rate at which organic molecules are formed in autotroph**
 b) Rate at which organic molecules are used up by an autotroph
 c) Storage of organic molecules in the body of an autotroph
 d) Rate at which organic molecules are transferred to next higher trophic level

47. Match the following given population interactions

(a) +/+	(i) Predation
(b) -/-	(ii) Ammensalism
(c) +/-	(iii) Competition
(d) -/0	(iv) Mutualism

a) (a) - iii, (b) - ii, (c) - i, (d) - iv b) (a) - iv, (b) - iii, (c) - ii, (d) - i c) (a) - iii, (b) - i, (c) - iv, (d) - ii

d) (a) - iv, (b) - iii, (c) - i, (d) - ii

48. Which of the following does not have stomata?

a) Hydrophytes b) Mesophytes c) Xerophytes **d) Submerged hydrophytes**

Solution : -

Submerged hydrophytes are those plants which live completely inside the water, so there is no need of transpiration that's why these plants do not have stomata, e.g. *Li-tricularia*, *Ceratophyllum*.

49. Path of energy flow in an ecosystem is:

a) Herbivorous → producer → carnivorous → decomposer

b) Herbivorous → carnivorous → producer → decomposer

c) Producer → carnivorous → herbivorous → decomposer

d) Producer → herbivorous → carnivorous → decomposer

50. The interdependent evolution of flowering plants and pollinating insects together is known as

a) mutualism **b) co-evolution** c) commensalism d) co-operation

Solution : -

The evolution of complementary adaptations in two species caused by the selection pressures that each exerts on the other is called co-evolution. It is common in symbiotic associations e.g., many insect-pollinated plants have evolved flowers whose shapes, colours, etc., make them attractive to particular insects, at the same time the pollinating insects have evolved sense organs and mouth parts specialised for quickly locating and extracting nectar from particular species of plants.