

Exercise - I (Conceptual Questions)

Build Up Your Understanding

1. The population of an insect species shows an explosive increase in numbers during rainy season followed by its disappearance at the end of the season. What does this show?
- (1) The population of its predators increases enormously
 - (2) S-shaped or sigmoid growth of this insect
 - (3) The food plants mature and die at the end of the rainy season.
 - (4) Its population growth curve is of J-type

BOP001

2. The formula for exponential population growth is -

$$\begin{array}{ll} (1) \frac{dN}{dt} = rN & (2) \frac{dN}{rN} = dt \\ (3) \frac{rN}{dN} = dt & (4) \frac{dN}{dt} = rN \end{array}$$

BOP002

3. Regarding life history variations. Which among the following is incorrect?
- (1) Breeding once in life time — Bamboo
 - (2) Breeding many times in life time — Birds
 - (3) Production in large number of small size offspring — Mammals
 - (4) Production in small number of large size offspring — Birds

BOP003

4.
$$\frac{dN}{dt} = rN \left(\frac{K - N}{N} \right)$$

In above equation $\left(\frac{K - N}{N} \right)$ represent: -

- (1) Carrying capacity
- (2) Environmental resistance
- (3) Rate of change in population density
- (4) Intrinsic rate of growth

BOP004

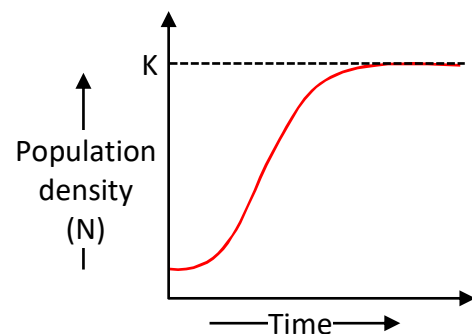
5. In a pond there are 400 lotus plant last year, through reproduction 16 new lotus plants are added, taking the current population to 416, then calculate the birth rate.
- (1) 0.4 offspring per year
 - (2) 0.6 offspring per year
 - (3) 0.08 offspring per year
 - (4) 0.04 offspring per year

BOP005

6. A country has a high number of reproductive individual than pre-reproductive individual, what is correct about the population?
- (1) Population is expanding
 - (2) Population is declining
 - (3) Population is stable
 - (4) Cannot be predicted

BOP006

7. In a logistic growth curve of population, environmental resistance is maximum when



- (1) value of 'r' is high
- (2) value of 'r' is low
- (3) N approaches K
- (4) K approaches N

BOP007

8. A group of individuals of same species constitute:
- (1) Organism
 - (2) Community
 - (3) Biome
 - (4) Population

BOP008

- | | |
|--|---|
| <p>9. Which of the following sequences is correct according to ecological hierarchy :-
 (1) Population, variety, community, ecosystem
 (2) Population, community, ecosystem, Biome
 (3) Population, community, species, ecosystem
 (4) Species, variety, ecosystem, population
 BOP009</p> <p>10. Properties of populations are not present in the ____ "A" ____ but arise as a result of interactions among the ____ "B" ____ comprising the population. "A" and "B" are :-
 (1) Organisms and ecosystems
 (2) Biomes and organisms
 (3) Organism and organisms
 (4) Ecosystems and communities.
 BOP010</p> <p>11. Fill in the blank.
 A is a unit of land with a natural boundary having a mosaic of patches. There patches generally represent different
 (1) Biome, Landscape
 (2) Biome, Ecosystem
 (3) Landscape, Ecosystem
 (4) Landscape, Biome
 BOP011</p> <p>12. In ecological hierarchy the abiotic factors are first time included at which hierarchical level
 (1) Community Level
 (2) Population Level
 (3) Ecosystem Level
 (4) Landscape Level
 BOP014</p> | <p>13. Biosphere is :
 (1) a component in the ecosystem
 (2) composed of the plants present in the soil
 (3) life in the outer space
 (4) composed of all living organisms present on earth which interact with the physical environment
 BOP015</p> <p>14. The species which establishes an essential link with other species to help the later in some vital activity, is called :-
 (1) Critical link species
 (2) Key stone species
 (3) Endemic species
 (4) Ecophene
 BOP016</p> <p>15. Species which play, a vital role in controlling the relative abundance of other species, and control functioning of the community is called
 (1) Dominant species
 (2) Key stone species
 (3) Link species
 (4) Network species
 BOP017</p> <p>16. Kangaroo rat in desert is an example of ?
 (1) Endemic species
 (2) Key stone species
 (3) Critical link species
 (4) None of these
 BOP018</p> <p>17. Which of the following is not an example of endemic species ?
 (1) Fig tree
 (2) Kangaroo
 (3) Kiwi
 (4) <i>Metasequoia</i>
 BOP019</p> |
|--|---|

- | | |
|--|---|
| <p>18. Mycorrhizal association is
 (1) Mutualism (2) Commensalism
 (3) Parasitism (4) Exploitation
 BOP020</p> <p>19. In general, species diversity _____ as we move away from the equator towards the poles
 (1) Increases
 (2) Decrease
 (3) Constant
 (4) Can not say anything
 BOP021</p> <p>20. Which of the following is not a characteristics of a community?
 (1) Dominance (2) Species diversity
 (3) Natality (4) Stratification
 BOP022</p> <p>21. The group of organisms of different species forms a
 (1) Community (2) Population
 (3) Ecosystem (4) Biome
 BOP026</p> <p>22. Organisms which breed only once in their life is :-
 (1) Pacific Salmon fish (2) Pacific Tuna fish
 (3) Pacific Shark (4) Pacific Oysters
 BOP027</p> <p>23. Sexual deceit is exhibited by :
 (1) Yucca plant (2) <i>Ophrys</i> plant
 (3) Wasp species (4) Fig Tree
 BOP028</p> <p>24. Which of the following is an example of co-evolution?
 (1) Barnacle & Whale
 (2) Clown fish & Sea Anemone
 (3) Hermit crab & Sea Anemone
 (4) Bees & orchid flower
 BOP029</p> | <p>25. A relationship between algae & fungi is an example of:
 (1) Commensalism (2) Protocooperation
 (3) Mutualism (4) Parasitism
 BOP030</p> <p>26. Lichens are the associations of
 (1) Protist and fungus
 (2) Algae and bacterium
 (3) Fungus and algae
 (4) Fungus and virus
 BOP031</p> <p>27. Which one of the following population interaction is (+, +) type :
 (1) Commensalism (2) Mutualism
 (3) Parasitism (4) Amensalism
 BOP032</p> <p>28. A wasp pollinating a fig flower is an example of:
 (1) Commensalism
 (2) Protocooperation
 (3) Mutualism
 (4) Parasitism
 BOP033</p> <p>29. Which one of the following interactions share a characteristic where none of the organism can complete its life cycle without the other participating organism?
 (1) <i>E.coli</i> and Human
 (2) Cattle egret bird and Cattle
 (3) Hermit Crab and Sea Anemone
 (4) <i>Yucca</i> and <i>Pronuba</i>
 BOP034</p> <p>30. Which of the following species relation is not an example of detrimental relation?
 (1) <i>Viscum</i> – Oak
 (2) Sparrow – Seed
 (3) <i>Loranthus</i>-Mango
 (4) Fig tree – Wasp
 BOP035</p> |
|--|---|

- 31.** They may reduce the survival, growth and reproduction of the other organism and reduce its population density, they might render the organism more vulnerable to predation by making it physically weak. They are:
 (1) Predator (2) Parasites
 (3) Ammensals (4) Commensal
BOP036
- 32.** Animals eating plants are categorised separately as herbivores, they are in a broad ecological context not very different from:
 (1) Parasite (2) Predator
 (3) Commensal (4) Amensal
BOP037
- 33.** Which statement is true for Connell's elegant field experiment?
 (1) Performed on prickly pear cactus
 (2) Shows resource partitioning
 (3) Was performed in rocky intertidal area of Scotland
 (4) Was done on *Pisaster*
BOP038
- 34.** The prickly pear cactus in the early 1920 introduced into :-
 (1) American pacific coast
 (2) Rocky sea coasts of Scotland
 (3) Galapagos islands
 (4) Australia
BOP039
- 35.** Which of the following concept is correct about amensalism?
 (1) Both species are benefitted
 (2) One species is benefitted and the other is neither benefitted nor harmed
 (3) One species is harmed whereas the other is unaffected
 (4) One species is benefitted and the other is harmed
BOP040
- 36.** Endemic plants -
 (1) Cosmopolitan
 (2) Occur in a particular area
 (3) Occur at high altitudes
 (4) Occur on north pole
BOP041
- 37.** Increase of population under optimum condition is termed.
 (1) Reproductive ability
 (2) Secondary production
 (3) Biotic potential
 (4) Biomass
BOP042
- 38.** Occurrence of endemic species in South America and Australia due to :-
 (1) These species has been extinct from other regions
 (2) Continental separation
 (3) There is no terrestrial route to these places
 (4) Retrogressive evolution
BOP043
- 39.** In a population unrestricted reproductive capacity is called as:
 (1) Biotic potential
 (2) Fertility
 (3) Carrying capacity
 (4) Birth rate
BOP044
- 40.** What is true for individuals of same species
 (1) Live in same niche
 (2) Live in same habitat
 (3) Interbreeding
 (4) Live in different habitat
BOP045
- 41.** When the two ecosystems overlap each other the area is called.
 (1) Ecotone (2) Niche
 (3) Edge effect (4) Ecotypes
BOP046

42. Group of two or more than two plant species is called as :-

- (1) Plant community
- (2) Animal ecosystem
- (3) Plant ecosystem
- (4) Ecological niche

BOP050

43. Competition for food, light and space is most severe in -

- (1) Closely related species growing in the same area (in the same niche)
- (2) Closely related species growing in different habitat
- (3) Distantly related species growing in the same habitat
- (4) Distantly related species growing in different habitat

BOP053

44. Most successful parasites are those which do not

- (1) Grow free
- (2) Kill their host
- (3) Reproduce sexually
- (4) Survive in soil

BOP054

45. The basic unit of ecological study is :-

- (1) species
- (2) organism
- (3) community
- (4) biosphere

BOP055

46. Mycorrhizae relationship between fungi and roots of higher plants is ?

- (1) Parasitic relationship
- (2) Saprophytic relationship
- (3) Symbiotic relationship
- (4) Epiphytic relationship

BOP056

47. Parasites adversely affect :-

- (1) Survival of host.
- (2) Growth of host.
- (3) Reproduction potential of host.
- (4) All of the above

BOP057

48. Identify the correct match :-

Column-I		Column-II	
(i)	Species diversity	(a)	Great influence on community stability
(ii)	Species dominance	(b)	Zonation according to the need of light
(iii)	Stratification	(c)	Different types of species in a community
(iv)	Keystone species	(d)	Highest number of one type of species

- (1) i-c, ii-b, iii-a, iv-d
- (2) i-c, ii-d, iii-b, iv-a
- (3) i-b, ii-a, iii-d, iv-c
- (4) i-b, ii-d, iii-a, iv-c

BOP058

49. The group of organisms of different species form a :-

- (1) Community
- (2) Population
- (3) Ecosystem
- (4) Biome

BOP060

50. Which of the following is an epiphyte ?

- (1) Orchid
- (2) Lianas
- (3) *Santalum*
- (4) Mango

BOP062

51. The correct statement for parasites is/are :-

- (a) Host specific parasites & hosts tend to co-evolve
- (b) Parasites have highly developed sense organs
- (c) Parasites may reduce population density of host
- (d) Parasites have highly developed digestive system

- (1) a and b
- (2) b and c
- (3) a and c
- (4) a and d

BOP063

52. A predator can be -
 (1) Carnivore only (2) Herbivore only
 (3) Mammal only (4) Both (1) and (2)

BOP169

53. Niche overlap indicates
 (1) sharing of one or more resources between the two species
 (2) mutualism between two species
 (3) active cooperation between two species
 (4) two different parasites on the same host

BOP065

54. A high density of elephant population in an area can result in :-
 (1) Predation on one another
 (2) Mutualism
 (3) Intra specific competition
 (4) Inter specific competition

BOP067

55. Geometric representation of age structure is a characteristic of :-
 (1) Ecosystem (2) Biotic community
 (3) Population (4) Landscape

BOP068

56. Which one of the following is one of the characteristics of a biological community?
 (1) Sex-ratio (2) Stratification
 (3) Natality (4) Mortality

BOP073

57. Which one of the following is categorised as a parasite in true sense?
 (1) The female Anopheles bites and sucks blood from humans.
 (2) Human foetus developing inside the uterus draws nourishment from the mother.

- (3) Head louse living on the human scalp as well as laying eggs on human hair.
 (4) The cuckoo (koel) lays its eggs in crow's nest.

BOP080

58. What type of human population is represented by the following age pyramid?



- (1) Vanishing population
 (2) Stable population
 (3) Declining population
 (4) Expanding population

BOP082

59. The logistic population growth is expressed by the equation :

- (1) $\frac{dN}{dt} = rN \left(\frac{N-K}{N} \right)$
 (2) $\frac{dt}{dN} = rN \left(\frac{K-N}{K} \right)$
 (3) $\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$
 (4) $\frac{dN}{dt} = rN$

BOP083

60. *Cuscuta* is an example of: -
 (1) Predation
 (2) Endoparasitism
 (3) Ectoparasitism
 (4) Brood parasitism

BOP085

EXERCISE-I (Conceptual Questions)

ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	4	3	2	4	2	3	4	2	3	3	3	4	1	2
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	1	1	2	3	1	1	2	4	3	3	2	3	4	4
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	2	2	3	4	3	2	3	2	1	3	1	1	1	2	2
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	3	4	2	1	1	3	4	1	3	3	2	3	3	3	3

SOLUTION

5. Given : No. of lotus plants in last year = 400

No. of lotus plants in current year = 416

No. of new lotus plants = 16

$$\begin{aligned}\text{Birth rate} &= \frac{\text{No. of birth in a year}}{\text{No. of individuals initial Population}} \\ &= \frac{16}{400} = 0.04 \text{ Lotus plants / Lotus plant / year}\end{aligned}$$

Exercise - II (Previous Year Questions)

AIPMT/NEET

AIPMT 2015

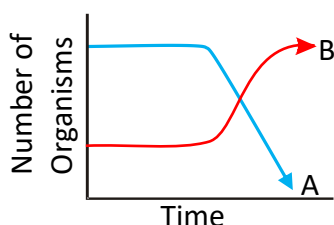
1. Most animals are tree dwellers in a:-
 (1) Thorn woodland
 (2) Temperate deciduous forest
 (3) Tropical rain forest
 (4) Coniferous forest

BOP087

2. Vertical distribution of different species occupying different levels in a biotic community is known as:
 (1) Stratification
 (2) Zonation
 (3) Pyramid
 (4) Divergence

BOP088

3. The following graph depicts changes in two populations (A and B) of herbivores in a grassy field A possible reason for these changes is that:



- (1) Population B competed more successfully for food than population A
 (2) Population A produced more offspring than population B
 (3) Population A consumed the members of population B
 (4) Both plant populations in this habitat decreased

BOP089

4. In which of the following interactions both partners are adversely affected?
 (1) Mutualism
 (2) Competition
 (3) Predation
 (4) Parasitism

BOP090

NEET-I 2016

5. When does the growth rate of a population following the logistic model equal zero? The logistic model is given as $\frac{dN}{dt} = rN \left(1 - \frac{N}{K} \right)$:-
 (1) when N/K is exactly one.
 (2) when N nears the carrying capacity of the habitat.
 (3) when N/K equals zero.
 (4) when death rate is greater than birth rate.

BOP091

6. Gause's principle of competitive exclusion states that:
 (1) More abundant species will exclude the less abundant species through competition.
 (2) Competition for the same resources excludes species having different food preferences.
 (3) No two species can occupy the same niche indefinitely for the same limiting resources.
 (4) Larger organisms exclude smaller ones through competition.

BOP092

7. Which of the following would appear as the pioneer organisms on bare rocks?
 (1) Lichens (2) Liverworts
 (3) Mosses (4) Green algae

BOP093

NEET-II 2016

8. The principle of competitive exclusion was stated by :-
 (1) MacArthur
 (2) Verhulst and Pearl
 (3) C. Darwin
 (4) G.F. Gause

BOP094

NEET-UG 2017

9. Asymptote in a logistic growth curve is obtained when:
 (1) $K = N$
 (2) $K > N$
 (3) $K < N$
 (4) The value of 'r' approaches zero

BOP095

10. Presence of plants arranged into well defined vertical layers depending on their height can be seen best in:
 (1) Tropical Rain Forest
 (2) Grassland
 (3) Temperate Forest
 (4) Tropical Savannah

BOP096

11. Mycorrhiza are the example of :
 (1) Amensalism
 (2) Antibiosis
 (3) Mutualism
 (4) Fungistasis

BOP097

12. In a hypothetical population of 100 individual having ' r ' = 0.5/female/year, what will be the population size in 6 years (with $e = 2.72$) showing exponential rate of growth ?
 (1) 1218 (2) 739 (3) 2012 (4) 448

BOP098

NEET-UG 2018

13. Niche is -
 (1) all the biological factors in the organism environment
 (2) the physical space where an organism live
 (3) the range of temperature that the organism needs to live
 (4) the functional role played by the organism where it lives

BOP099

14. Which one of the following plants shows a very close relationship with a species of moth, where none of the two can complete its life cycle without the other?
 (1) Hydrilla (2) Yucca
 (3) Banana (4) Viola

BOP100

15. Which of the following flowers only once in its life-time?
 (1) Bamboo species (2) Jack fruit
 (3) Mango (4) Papaya

BOP101

16. Natality refers to-
 (1) Death rate
 (2) Birth rate
 (3) Number of individuals leaving the habitat
 (4) Number of individuals entering a habitat

BOP102

17. In a growing population of a country
- (1) pre-reproductive individuals are more than the reproductive individuals.
 - (2) reproductive individuals are less than the post-reproductive individuals.
 - (3) reproductive and pre-reproductive individuals are equal in number.
 - (4) pre-reproductive individuals are less than the reproductive individuals.

BOP103

NEET-UG 2019 (Odisha)

18. Carnivorous animals - lions and leopards, occupy the same niche but lions predate mostly larger animals and leopards take smaller ones. This mechanism of competition is referred to as :-
- (1) Character displacement
 - (2) Altruism
 - (3) Resource partitioning
 - (4) Competitive exclusion

BOP104

19. Match Column-I with Column-II.

Column-I		Column-II	
(a)	Saprophyte	(i)	Symbiotic association of fungi with plant roots
(b)	Parasite	(ii)	Decomposition of dead organic materials
(c)	Lichens	(iii)	Living on living plants or animals
(d)	Mycorrhiza	(iv)	Symbiotic association of algae and fungi

Choose the **correct** answer from the options given below :-

	(a)	(b)	(c)	(d)
(1)	(i)	(ii)	(iii)	(iv)
(2)	(iii)	(ii)	(i)	(iv)
(3)	(ii)	(i)	(iii)	(iv)
(4)	(ii)	(iii)	(iv)	(i)

BOP105

20. Between which among the following, the relationship is not an example of commensalism?
- (1) Orchid and the tree on which it grows
 - (2) Cattle Egret and grazing cattle
 - (3) Sea Anemone and Clown fish
 - (4) Female wasp and fig species

BOP106

NEET-UG 2020

21. Which of the following is not an attribute of a population?
- (1) Species interaction
 - (2) Sex ratio
 - (3) Natality
 - (4) Mortality

BOP107

22. Match the items in Column-I with those in Column-II :

Column I

Column II

- | | |
|-----------------------|------------------|
| (a) Herbivores-Plants | (i) Commensalism |
| (b) Mycorrhiza-Plants | (ii) Mutualism |
| (c) Sheep-Cattle | (iii) Predation |
| (d) Orchid-Tree | (iv) Competition |

Select the **correct** option from following:

- (1) (a)–(iv), (b)–(ii), (c)–(i), (d)–(iii)
- (2) (a)–(iii), (b)–(ii), (c)–(iv), (d)–(i)
- (3) (a)–(ii), (b)–(i), (c)–(iii), (d)–(iv)
- (4) (a)–(i), (b)–(iii), (c)–(iv), (d)–(ii)

BOP108

23. The impact of immigration on population density is: -
- (1) Negative
 - (2) Both positive and negative
 - (3) Neutralized by natality
 - (4) Positive

BOP109

NEET 2021

24. In spite of interspecific competition in nature, which mechanism the competing species might have evolved for their survival?
- (1) Resource partitioning
 - (2) Competitive release
 - (3) Mutualism
 - (4) Predation

BOP110

25. Amensalism can be represented as:

- (1) Species A (–); Species B (0)
- (2) Species A (+); Species B (+)
- (3) Species A (–); Species B (–)
- (4) Species A (+); Species B (0)

BOP111

26. In the exponential growth equation

$$N_t = N_0 e^{rt}$$

e represents:

- (1) The base of number logarithms
- (2) The base of exponential logarithms
- (3) The base of natural logarithms
- (4) The base of geometric logarithms

BOP112

27. Match List-I with List-II.

	List-I		List-II
(a)	Allen's Rule	(i)	Kangaroo rat
(b)	Physiological adaptation	(ii)	Desert lizard
(c)	Behavioural adaptation	(iii)	Marine fish at depth
(d)	Biochemical Adaptation	(iv)	Polar seal

Choose the **correct** answer from the options given below.

- (1) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
- (2) (a)-(iv), (b)-(i), (c)-(iii), (d)-(ii)
- (3) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
- (4) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

BOP113

28. If a pond has 40 lotus plants last year and through reproduction 8 new plants are added, taking the current population to 48, what will be the birth rate?

- (1) 0.6 offspring per lotus per year
- (2) 0.5 offspring per lotus per year
- (3) 0.2 offspring per lotus per year
- (4) 0.1 offspring per lotus per year

BOP115

NEET-UG 2022

29. Which one of the following statements cannot be connected to Predation?

- (1) It might lead to extinction of a species
- (2) Both the interacting species are negatively impacted
- (3) It is necessitated by nature to maintain the ecological balance
- (4) It helps in maintaining species diversity in a community

BOP116

30. While explaining interspecific interaction of population, (+) sign is assigned for beneficial interaction, (–) sign is assigned for detrimental interaction and (0) for neutral interaction. Which of the following interactions can be assigned (+) for one species and (–) for another species involved in the interaction?

- (1) Amensalism
- (2) Commensalism
- (3) Competition
- (4) Predation

BOP117

31. Two butterfly species are competing for the same nectar of a flower in a garden. To survive and coexist together, they may avoid competition in the same garden by:

- (1) feeding at the same time
- (2) choosing different foraging patterns
- (3) increasing time spent on attacking each other
- (4) predating on each other

BOP118

32. The pioneer species in a hydrarch succession are:

- (1) Free-floating angiosperms
- (2) Submerged rooted plants
- (3) Phytoplanktons
- (4) Filamentous algae

BOP119

33. The species that come to appear in bare area are called:

- (1) Pioneer species
- (2) Invasive species
- (3) Competitive species
- (4) Species of seral community

BOP120

34. All successions irrespective of the habitat proceed to which type of climax community?

- (1) Xeric
- (2) Mesic
- (3) Hydrophytic
- (4) Edaphic

BOP121

NEET-UG 2023

35. Given below are two statements :-

Statement-I : Gause's 'Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot co-exist indefinitely and competitively inferior one will be eliminated eventually.

Statement II : In general, carnivores are more adversely affected by competition than herbivores.

In the light of the above statements, choose the **correct** answer from the options given below:

- (1) Both **Statement I** and **Statement II** are false.

- (2) **Statement I** is correct but **Statement II** is false.

- (3) **Statement I** is incorrect but **Statement II** is true.

- (4) Both **Statement I** and **Statement II** are true.

BOP149

36. Match List I with List II :

List-I (Interaction)		List-II (Species A and B)	
A.	Mutualism	I.	+ (A), 0 (B)
B.	Commensalism	II.	- (A), 0 (B)
C.	Amensalism	III.	+ (A), - (B)
D.	Parasitism	IV.	+ (A), + (B)

Choose the **correct** answer from the options given below:-

- (1) A-IV, B-I, C-II, D-III

- (2) A-IV, B-III, C-I, D-II

- (3) A-III, B-I, C-IV, D-II

- (4) A-IV, B-II, C-I, D-III

BOP150

37. Match List I with List II.

List-I (Interacting species)		List-II (Name of Interaction)	
A.	A Leopard and a Lion in a forest/ grassland	I.	Competition
B.	A Cuckoo laying egg in a Crow's nest	II.	Brood parasitism
C.	Fungi and root of a higher plant in Mycorrhizae	III.	Mutualism
D.	A cattle egret and a Cattle in a field	IV.	Commensalism

Choose the **correct** answer from the options given below :-

- (1) A-I, B-II, C-IV, D-III

- (2) A-III, B-IV, C-I, D-II

- (3) A-II, B-III, C-I, D-IV

- (4) A-I, B-II, C-III, D-IV

BOP151

38. Match List I with List II.

	List-I		List-II
A.	Logistic growth	I.	Unlimited resource availability condition
B.	Exponential growth	II.	Limited resource availability condition
C.	Expanding age pyramid	III.	The percent individuals of pre-reproductive age is largest followed by reproductive and post reproductive age groups
D.	Stable age pyramid	IV.	The percent individuals of pre reproductive and reproductive age group are same

Choose the **correct** answer from the options given below :-

- (1) A-II, B-III, C-I, D-IV
- (2) A-II, B-IV, C-I, D-III
- (3) A-II, B-IV, C-III, D-I
- (4) A-II, B-I, C-III, D-IV

BOP152

NEET-UG 2023 (Manipur)

39. Match List-I with List-II.

	List-I		List-II
(A)	Hydrarch succession	(I)	Gradual change in the species composition
(B)	Xerarch succession	(II)	Faster and climax reached quickly
(C)	Ecological succession	(III)	Lichens to mesic conditions
(D)	Secondary succession	(IV)	Phytoplankton to mesic conditions

Choose the **correct** answer from the options given below :-

- (1) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)
- (2) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
- (3) (A)-(I), (B)-(IV), (C)-(II), (D)-(III)
- (4) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

BOP153

40. Plants offer rewards to animals in the form of pollen and nectar and the animals facilitate the pollination process. This is an example of :

- (1) Amensalism
- (2) Competition
- (3) Commensalism
- (4) Mutualism

BOP154

41. The species of plants that plays a vital role in controlling the relative abundance of other species in a community is called _____.

- (1) alien species
- (2) endemic species
- (3) exotic species
- (4) keystone species

BOP155

42. For chemical defence against herbivores, *Calotropis* has :

- (1) cardiac glycosides
- (2) strychnine
- (3) toxic ricin
- (4) distasteful quinine

BOP156

NEET-UG 2024

43. The equation of Verhulst-Pearl logistic growth is $\frac{dN}{dt} = rN \left[\frac{K - N}{K} \right]$

From this equation, K indicates :

- (1) Intrinsic rate of natural increase
- (2) Biotic potential
- (3) Carrying capacity
- (4) Population density

BOP170

44. **Statement-I:** Gause's competitive exclusion principle states that two closely related species competing for different resources cannot exist indefinitely.

Statement-II: According to Gause's principle, during competition, the inferior will be eliminated. This may be true if resources are limiting.

In the light of the above statements, choose the correct answer from the options given below.

- (1) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false.
- (3) Statement I is true but Statement II is false.
- (4) Statement I is false but Statement II is true.

BOP171

RE-NEET-UG 2024

45. When will the population density increase, under special conditions ?

- (1) deaths exceeds number of births and also number of emigrants equals number of immigrants.
- (2) births plus number of immigrants equals number of deaths plus number of emigrants.
- (3) births plus number of emigrants is more than the number of deaths plus number of immigrants.
- (4) births plus number of immigrants is more than the sum of number of deaths and number of emigrants.

BOP172

46. Match List-I with List-II :

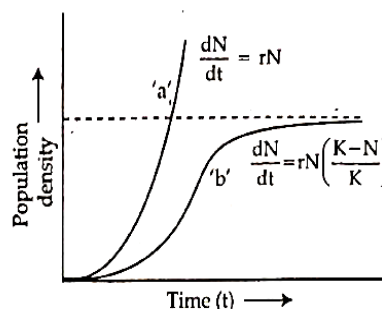
	List-I		List-II
A.	Migratory flamingos and resident fish in South American lakes	I.	Interference Competition
B.	Abingdon tortoise became extinct after	II.	Competitive release

	introduction of goats in their habitat		
C.	<i>Chathamalus</i> expands its distributional range in the absence of <i>Balanus</i>	III.	Resource Partitioning
D.	Five closely related species of Warblers feeding in different locations on same tree	IV.	Interspecific competition

- (1) A-I, B-IV, C-III, D-II
- (2) A-IV, B-I, C-II, D-III
- (3) A-III, B-I, C-II, D-IV
- (4) A-II, B-IV, C-III, D-I

BOP173

47. What do 'a' and 'b' represent in the following population growth curve ?



- (1) 'a' represents exponential growth when responses are not limiting the growth; and 'b' represents logistic growth when responses are limiting the growth
- (2) 'a' represents logistic growth when responses are not limiting the growth; 'b' represents exponential growth when responses are limiting the growth.
- (3) 'a' represents carrying capacity and 'b' shows logistic growth when responses are limiting the growth.
- (4) 'a' represents exponential growth when responses are not limiting the growth and 'b' shows carrying capacity.

BOP174

48. Match List-I with List-II.

	List-I		List-II
A.	Predator	I.	<i>Ophrys</i>
B.	Mutualism	II.	<i>Pisaster</i>
C.	Parasitism	III.	Female wasp and fig
D.	Sexual deceit	IV.	<i>Plasmodium</i>

Choose the **correct** answer from the options given below :-

(1) A-III, B-II, C-I, D-IV

(2) A-IV, B-I, C-II, D -III

(3) A-II, B-III, C-I, D-IV

(4) A-II, B-III, C-IV, D-I

BOP175

EXERCISE-II (Previous Year Questions)

ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	3	1	1	2	1	3	1	4	1	1	3	3	4	2	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	1	3	4	4	1	2	4	1	1	3	3	3	2	4
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	2	3	1	2	2	1	4	4	4	4	4	1	3	4	4
Question	46	47	48												
Answer	2	1	4												

SOLUTION

12. Given :

$$N_0 = 100, \quad N_t = ?, \quad r = 0.5, \quad t = 6 \text{ yrs}$$

$$N_0 = N_t e^{rt}$$

$$= 100 \times 2.72^{(0.5 \times 6)}$$

$$= 100 \times 2.72^3$$

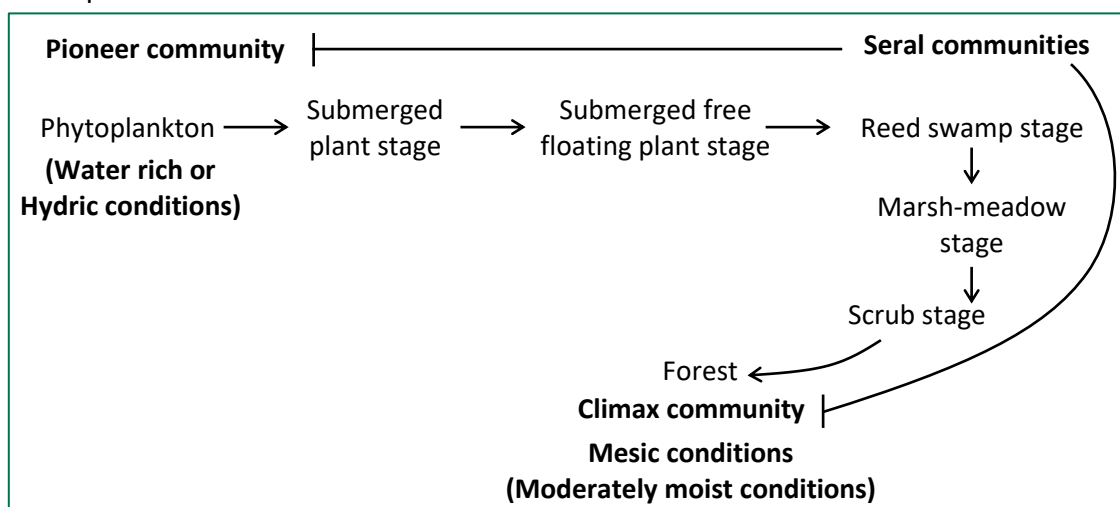
$$= 100 \times 20.12$$

$$N_t = 2012$$

27. (a) Polar seal (Cold climate) has shorter limbs to reduce heat loss (Allen's Rule).
 (b) Kangaroo rat use metabolic water for its requirement. It is a physiological adaptation
 (c) Desert lizard comes out of burrow when its body temperature goes down and goes back to the burrow after sun-bath. It is a behavioural adaptation.
 (d) Marine fishes at depth has special proteins that help in their survival at greater depths and it is a physiological adaptation.

32. **Ecological succession is the process by which plant and animal communities gradually change over time.**

Succession that takes place in water body is called hydrarch succession, during hydrarch / hydrosere occurring in a newly formed water body following gradual and sequential changes takes place.



33. Pioneer species are the first organisms to colonize a new area, such as a barren environment or a disturbed ecosystem.
34. The succession leads to mesic (medium) conditions to attain more biodiversity and stability.
39. (A) Hydrarch succession — Succession in water body.
 (B) Xerarch succession — Succession dry environments, such as deserts and sand dunes.
 (C) Ecological succession — Gradual change in the species composition.
 (D) Secondary succession — Process by which plants and animals recolonize a disturbed area, using the remaining soil and nutrients to rebuild the ecosystem.

Exercise - III

Master Your Understanding

(A) NCERT BASED QUESTIONS

1. Select the statement which explains best parasitism :-
 (1) One organism is benefited
 (2) Both the organism are benefited
 (3) One organism is benefited, other is not affected
 (4) One organism is benefited, other is affected

BOP122

2. The role of an organism in the ecological system is known as
 (1) Habitat (2) Herbivory
 (3) Niche (4) Interaction

BOP123

3. Select the statement which best explains commensalism: -
 (1) One organism is benefited
 (2) Both the organisms are benefited
 (3) One organism is benefitted, other is not affected
 (4) One organism is benefitted, other is affected.

BOP124

4. Community is defined as aggregation of: -
 (1) Individuals of the same kind
 (2) Individuals of same species
 (3) Individuals of a population
 (4) Populations of different species.

BOP125

5. Parasite can be explained as an organism which depends on others: -
 (1) For food
 (2) For shelter
 (3) For both food and shelter
 (4) For Reproduction

BOP126

6. An orchid plant growing on the branch of mango tree, what is the interaction between orchid & mango ?
 (1) Parasitism
 (2) Commensalism
 (3) Protocoperation
 (4) Mutualism

BOP127

7. Mark the important defence mechanism in plants against herbivory :-
 (1) Spines (2) Toxic Chemical
 (3) Both (1) & (2) (4) None of these

BOP128

8. Species A (-) & Species B(o) shows the following interaction: -
 (1) Amensalism (2) Predation
 (3) Mutualism (4) Competition

BOP129

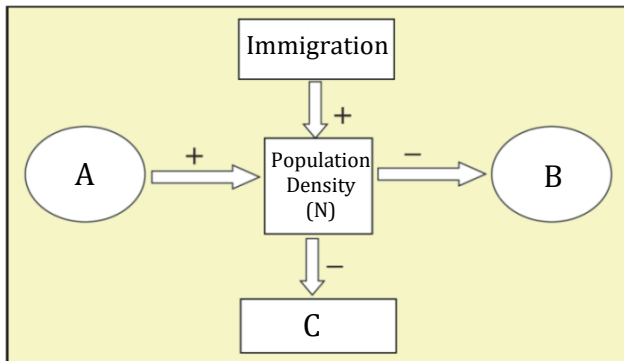
9. The age pyramid with broad base indicates:
 (1) High percentage of young individuals
 (2) Low percentage of young individuals
 (3) High percentage of old individuals
 (4) Low percentage of old individuals

BOP130

10. In a decline population of a country:
 (1) Number of pre reproductive is more than reproductive.
 (2) Number of pre reproductive is less than reproductive.
 (3) Number of pre reproductive is equal to reproductive.
 (4) Reproductive are less than post reproductive.

BOP131

11. In the diagram given above, which of the following option correctly represents A, B and C.



- (1) A = Death rate, B = Birth rate,
C = Emigration
(2) A = Birth rate, B = Death rate,
C = Emigration
(3) A = Emigration, B = Death rate,
C = Birth rate
(4) A = Death rate, B = Emigration,
C = Birth rate

BOP132

12. Which of the following equation is/are correct for the population density (N) at time $t + 1$?

N = Density at time 't'

B = Natality

D = Mortality

I = Immigration

E = Emigration

- (A) $N_{(t+1)} = N_t + [(B + I) - (D + E)]$
(B) $N_{(t+1)} = N_t + [(B - D) + (I - E)]$
(C) $N_{(t+1)} = N_t + [(B + I) + (D + E)]$
(D) $N_{(t+1)} = N_t - [(B - D) + (I - E)]$

- (1) Only A
(2) Only A and B
(3) Only C
(4) A, B, C and D

BOP133

13. In a population there are higher number of pre-reproductive individuals, moderate number of reproductive individuals and less post reproductive individuals are present. This type of population represents: -
(1) Population of developed countries
(2) Population of developing country
(3) Stable growth
(4) Declining population

BOP134

14. In a new habitat which is just being colonised which will play significant role in population growth: -

- (1) Birth rate (2) Emigration
(3) Migration (4) Immigration

BOP135

(B) ANALYTICAL QUESTIONS

15. What will happen if the number of organism increased at a place: -

- (1) Inter species competition
(2) Intra species competition
(3) Both
(4) None

BOP137

16. Which of the following is a correct pair:

- (1) *Cuscuta* - parasite
(2) *Dischidia* - insectivorous
(3) *Opuntia* - predator
(4) *Capsella* - hydrophyte

BOP139

17. Which one of the following correctly represents an organism and its ecological niche?

- (1) *Vallisneria* and pond
(2) Desert locust (*Schistocerca*) and desert
(3) Plant lice (aphids) and leaf
(4) Vultures and dense forest

BOP141

18. In a population birth rate is 0.15 and death rate is 0.08 during a unit time period. What is the value of r (intrinsic rate of natural increase) for given population?

(1) 0.23 (2) 0.07
(3) 0.05 (4) 0.25

BOP142

19. A population has more young individuals, compared to older individuals. What would be the status of the population after some years:

(1) It will decline
(2) It will stabilize
(3) It will first decline and then stabilize
(4) It will increase

BOP143

20. In a month of January Siberian cranes migrate from Russia to India for breeding, a survey was done till December total population of Siberian cranes = 1200

Birth rate = 400

Mortality rate = 200

Number of cranes immigrated = 600

Number of cranes emigrated = 300

Calculate the total population

(1) 1500 (2) 1000
(3) 2000 (4) 1700

BOP144

21. If a population of 50 *Paramecium* present in a pool increase to 150 after an hour, what would be the growth rate of population ?

(1) 50 per hours
(2) 200 per hour
(3) 5 per hour
(4) 100 per hour

BOP145

22. Lichens are well known combination of an alga and a fungus where fungus has :

(1) An epiphytic relationship with the alga
(2) A parasitic relationship with the alga
(3) A symbiotic relationship with the alga
(4) A saprophytic relationship with the alga

BOP146

23. Which one of the following is a matching pair of certain organisms(s) and the kind of association

(1) Shark and sucker fish- amensalism
(2) Algae and fungi in lichens-mutualism
(3) Orchids growing on trees-parasitism
(4) *Cuscuta* (dodder) growing on other flowering plants-predation

BOP147

24. The table below gives the populations (in thousands) of ten species (A – J) in four areas (a – d) consisting of the number of habitats given within brackets against each. Study the table and answer the question which follows: -

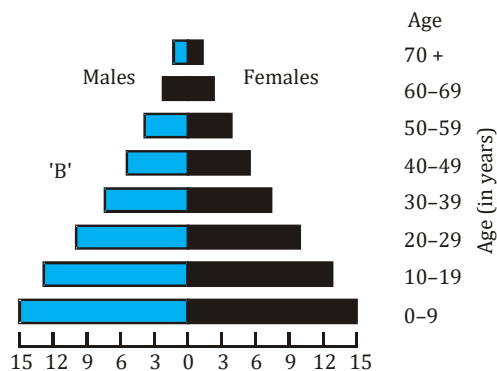
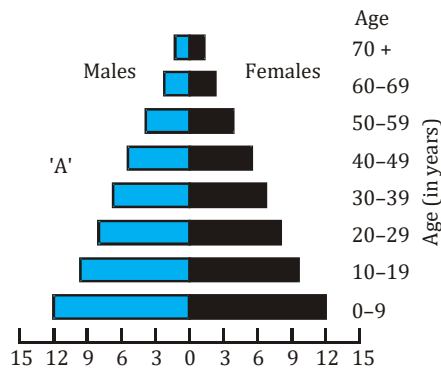
Area and Number of habitats	Species and their populations (in thousands) in the areas									
	A	B	C	D	E	F	G	H	I	J
a (11)	2.3	1.2	0.52	6	-	3.1	1.1	9	-	10.3
b (11)	10.2	-	0.62	-	1.5	3	-	8.2	1.1	11.2
c (13)	11.3	0.9	0.48	2.4	1.4	4.2	0.8	8.4	2.2	4.1
d (12)	3.2	10.2	11.1	4.8	0.4	3.3	0.8	7.3	11.3	2.1

Which area out of a to d shows maximum species diversity?

(1) d (2) a (3) b (4) c

BOP070

25. A country with a high rate of population growth took measures to reduce it. The figure below shows age-sex pyramids of populations A and B twenty years apart. Select the correct interpretation about them:



- (1) "A" is the earlier pyramid and no change has occurred in the growth rate
- (2) "A" is more recent and shows slight reduction in the growth rate
- (3) "B" is the earlier pyramid and shows stabilised growth rate
- (4) "B" is more recent showing that population is very young

BOP072

26. Study the four statements (a-d) given below and select the two correct ones out of them

- (a) A lion eating a deer and a sparrow feeding on grain are ecologically similar in being consumers
- (b) Predator star fish *Pisaster* helps in maintaining species diversity of some invertebrates

- (c) Predators ultimately lead to the extinction of prey species
- (d) Production of chemicals such as nicotine, strychnine by the plants are metabolic disorders

The two correct statements are :

- (1) (a) and (b)
- (2) (b) and (c)
- (3) (c) and (d)
- (4) (a) and (d)

BOP074

27. Which one of the following is most appropriately defined?

- (1) Amensalism is a relationship in which one species is benefited whereas the other is unaffected.
- (2) Predator is an organism that catches and kills other organism for food.
- (3) Parasite is an organism which always lives inside the body of other organism and may kill it.
- (4) Host is an organism which provides food to another organism.

BOP077

28. A sedentary sea anemone gets attached to the shell lining of hermit crab. The association is :

- (1) Amensalism
- (2) Ectoparasitism
- (3) Symbiosis
- (4) Commensalism

BOP086

29. Animals eating plants are categorised separately as herbivores, they are in a broad ecological context not very different from :-

- (1) Parasite
- (2) Predator
- (3) Commensal
- (4) Amensal

BOP157

- 30.** Which statements are true about inter specific interactions ?
 (i) One is benefitted and other is uneffected in mutualism.
 (ii) Both partners are benefitted in commensalism.
 (iii) One kills and eats another in predation.
 (iv) Both partners can be benefitted in symbiosis.
 (1) (i) and (ii) only (2) (i) and (iii) only
 (3) (ii) and (iii) only (4) (iii) and (iv) only
BOP158
- 31.** They may reduce the survival, growth and reproduction of the other organism and reduce its population density, they might render the organism more vulnerable to predation by making it physically weak, they are :-
 (1) Predator (2) Parasite
 (3) Amensal (4) Commensal
BOP159
- 32.** Choose the correct match :-
 (a) Co-evolution – Endoparasite & Host
 (b) Mutualism – Relation of algae & fungi
 (c) Sexual deceit – Shown by *Opuntia plant*
 (d) Marine fishes and Copepods – Parasitism
 (1) Only a & b (2) Only b & c
 (3) Only c & d (4) a, b & d
BOP160
- 33.** Select the incorrect statement :-
 (1) Carnivores appear to be more adversely affected by competition than Herbivores
 (2) Species diversity in a community depends upon size of area
 (3) The cattle egret and grazing cattle is an example of commensalism
 (4) Clear stratification is found in tropical rain forest
BOP161
- 34.** How many on the given population interections are positive type of interaction ?
 Orchids and bees, fig and wasp, barnacles and whale, goat and abingdon tortoise, flamingoes and fish.
 (1) One (2) Two
 (3) Three (4) Four
BOP162
- 35.** You can never see any cattle or goats browsing on *Calotropis* because :-
 (1) They produce highly poisonous cardiac glycosides
 (2) They have spines instead of leaves
 (3) They are distasteful to their herbivores
 (4) They are too long in heights to reach by herbivores
BOP163
- 36.** **Assertion:** Some organism breed only once in their lifetime while others breed many times during their lifetime.
Reason: Population evolve to minimise their reproductive fitness.
 (1) Both assertion and reason are true and the reason is the correct explanation of the assertion
 (2) Both assertion and reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true but reason is false
 (4) Both assertion and reason are false
BOP164

- 37.** Why predator are prudent in nature ?
 (1) They keep prey population under control
 (2) They maintain species diversity
 (3) They do not over exploit its prey
 (4) They are too efficient to kill their pray.

BOP165

- 38.** Competition for food, light and space is most severe between two
 (1) Closely related species growing in the same area.
 (2) Closely related species growing in different habitat.
 (3) Distantly related species growing in the same habitat.
 (4) Distantly related species growing in different habitat.

BOP166

- 39.** Read the following statement for population interaction and find out correct option :
 (A) Some species of insects and frogs are cryptically coloured to avoid being detected easily by the predator.
 (B) Lichens represent a mutualistic relationship between a fungus and photosynthesising algae.
 (C) Amensalism is 0, –type of interspecific interaction.
 (1) Only A, C is correct
 (2) Only B, C is correct
 (3) Only C is incorrect
 (4) All are correct

BOP167

- 40.** Consider the following four statements and select the option which includes all the correct ones:-
 (a) Sparrow eating any seed is not less than a predator.
 (b) Commensalism is +/– type of relationship.
 (c) Nearly 25% of all insects are known to be phytophagous.
 (d) Mutualism is +/+ type of relationship.
 (1) Statements- (a), (c), (d)
 (2) Statements- (a), (b)
 (3) Statements- (a), (b), (c)
 (4) Statements- (b), (d)

BOP168

EXERCISE - III

ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	3	3	4	3	2	3	1	1	2	2	2	2	4	3
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	1	1	2	4	4	4	3	2	1	2	1	2	4	2	4
Question	31	32	33	34	35	36	37	38	39	40					
Answer	2	4	1	3	1	3	3	1	4	1					

SOLUTION

18. $b = 0.15$,

$d = 0.08$

$r = (b - d)$

$r = 0.15 - 0.08$

$r = 0.07$

20. $N_t = 1200$, $I = 600$

$B = 400$, $E = 300$

$D = 200$, $N_{(t+1)} = ?$

$N_{(t+1)} = N_t = [(B+I) - (D+E)]$

$= 1200 + [(400 + 600) - (200 + 300)]$

$= 1200 + [1000 - 500]$

$N_{(t+1)} = 1200 + 500 = 1700$

21. Initial population = 50

Population after an hour = 150

Increase in population in an hour

$= 150 - 50 = 100$

So, growth rate = 100 per hour

24. Area 'd' contains members of all 10 species and has less number of habitats (12) than area 'c'.

25. Pyramid 'A' shows less number of pre-reproductive population than pyramid 'B'.

Important Notes