

**SAMPLE CONTENT**

**MHT-CET**

**TRIUMPH**

# **BIOLOGY**

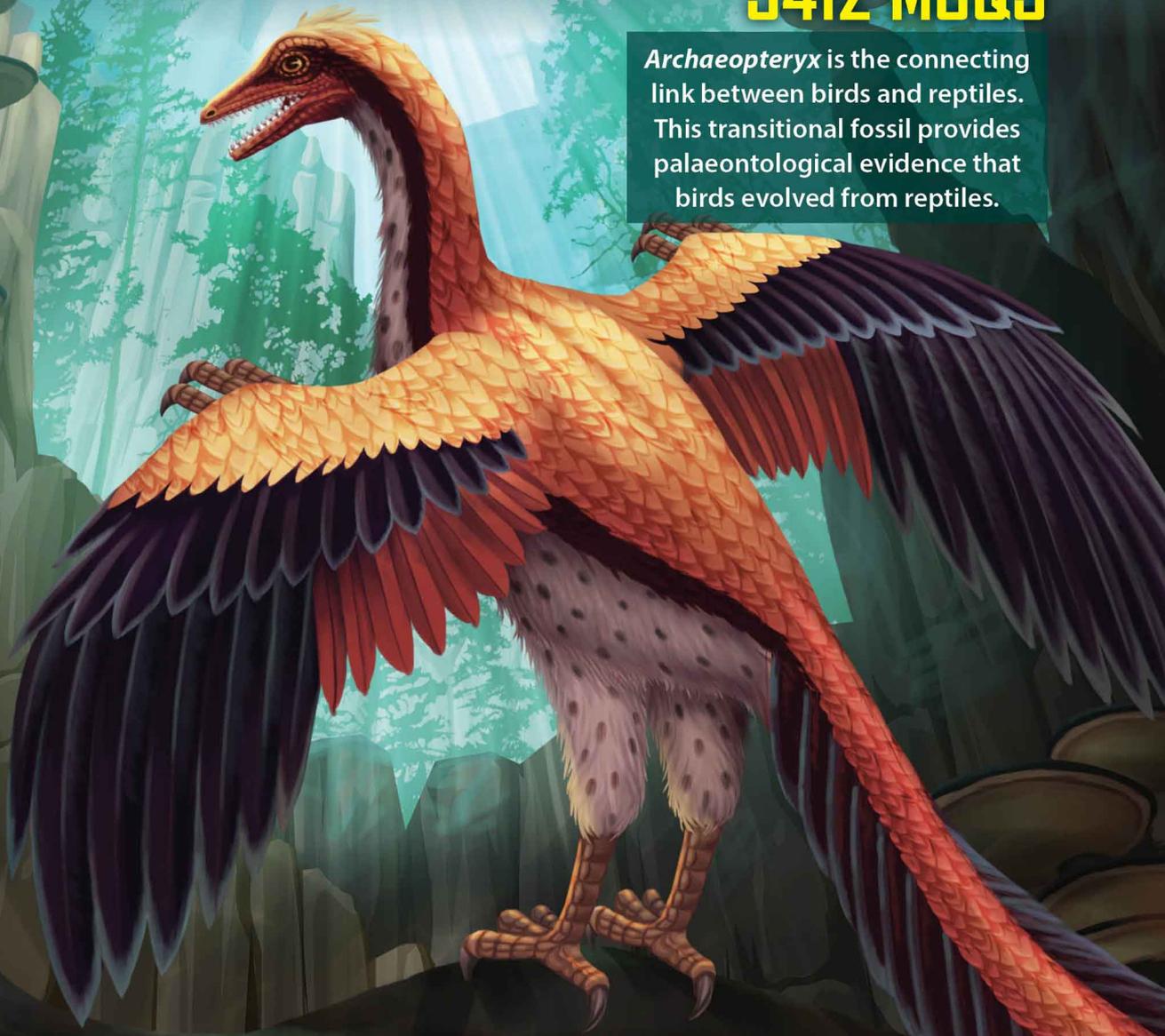
BASED ON STD. XI & XII SYLLABUS OF MHT-CET

**MULTIPLE CHOICE  
QUESTIONS**

**5412 MCQS**



*Archaeopteryx* is the connecting link between birds and reptiles. This transitional fossil provides palaeontological evidence that birds evolved from reptiles.



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**Target** Publications® Pvt. Ltd.

# MHT-CET TRIUMPH 5412 BIOLOGY MULTIPLE CHOICE QUESTIONS

Based on Std. XI & XII Syllabus of MHT-CET

## Salient Features

- ☞ Includes chapters of Std. XII and relevant chapters of Std. XI as per latest MHT-CET Syllabus
- ☞ '5412' MCQs including questions from various competitive exams
- ☞ Exhaustive subtopic wise coverage of MCQs
- ☞ Quick review provided for each chapter
- ☞ Exhaustive coverage of various competitive exam questions till the latest year
- ☞ Evaluation test provided at the end of each chapter
- ☞ Two Model Question Papers with Answer Keys and Solutions provided in the form of QR Code

Scan the adjacent QR code to download Model Paper I and Solution.



Scan the adjacent QR code to download Model Paper II and Solution.



Scan the adjacent QR code to download Hints for relevant questions and Solutions to Evaluation Test in PDF format.



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## PREFACE

“Don’t follow your dreams; chase them!”- a quote by Richard Dumbrell is perhaps the most pertinent for one who is aiming to crack entrance examinations held after std. XII. We are aware of an aggressive competition a student appearing for such career-defining examinations experiences and hence wanted to create books that develop the necessary knowledge, tools and skills required to excel in these examinations.

For the syllabus of **MHT-CET**, 80% of the weightage is given to the syllabus for XII standard while only 20% is given to the syllabus for XI standard (with inclusion of only selected topics).

Although the syllabus for Std. XI - XII and MHT-CET is aligned, the outlook to study the subject should be altered based on the nature of the examination. To score in MHT-CET, a student has to be not just good with the concepts but also quick to complete the test successfully. Such ingenuity can be developed through sincere learning and dedicated practice.

Having thorough knowledge of theory and its applications is a prerequisite for solving MCQs of Biology. Students must know the important processes and mechanisms that formulate the basics of the chapter. Biology is conveyed using diagrams and figures; therefore, students should study and understand them well. Students should aim to study integrated concepts and relate them to their real – life applications in order to visualize a clear map of the entire concept. It should be kept in mind that every single line of text has potential of generating several MCQs.

As a first step to master MCQ solving, students should start with elementary questions. Once a momentum is gained, complex MCQs with higher level of difficulty should be practised. Relevant questions from previous years as well as from other similar competitive exams should be solved to obtain an insight about plausible questions.

Competitive exams challenge the understanding of students about subject by combining concepts from different chapters in a single question. To figure these questions out, cognitive understanding of the subject is required. Therefore, students should put in extra effort to practise such questions.

Such a holistic preparation is the key to succeed in the examination!

To quote Dr. A.P.J. Abdul Kalam, “If you want to shine like a sun, first burn like a sun.”

Our Triumph Biology book has been designed to achieve the above objectives. Commencing from basic MCQs the book proceeds to develop competence to solve complex MCQs. It offers ample practice of recent questions from various competitive examinations. While offering standard solutions in the form of concise hints. Each chapter ends with an Evaluation test to allow self-assessment.

Features of the book presented on the next page will explicate more about the same!

*We hope the book benefits the learner as we have envisioned.*

- Publisher

**Edition:** Second

The journey to create a complete book is strewn with triumphs, failures and near misses. If you think we’ve nearly missed something or want to applaud us for our triumphs, we’d love to hear from you.

Please write to us on: [mail@targetpublications.org](mailto:mail@targetpublications.org)

## FEATURES

Quick Review

**Quick Review** includes tables/ flow charts to summarize the key points in the chapter.

*This is our attempt to help students to reinforce key concepts.*

**Classical Thinking** section encompasses straight forward questions including knowledge based questions.

*This is our attempt to revise the chapter in its basic form and warm up the students to deal with complex MCQs.*

Classical Thinking

Critical Thinking

**Critical Thinking** section encompasses challenging questions which test understanding, rational thinking and application skills of the students.

*This is our attempt to take the students from beginner to proficient level in smooth steps.*

**Competitive Thinking** section encompasses questions from various competitive examinations like MHT CET, AIPMT/NEET-UG, etc.

*This is our attempt to give the students practice of competitive questions and advance them to acquire knack essential to solve such questions.*

Competitive Thinking

Subtopic wise segregation

Every section is **segregated sub-topic wise.**

*This is our attempt to cater to individualistic pace and preferences of studying a chapter and enabling easy assimilation of questions based on the specific concept.*

The **Miscellaneous** section incorporates MCQs whose solutions require knowledge of concepts covered in different sub-topics of same chapter or from different chapters.

*This is our attempt to develop cognitive thinking in the students essential to solve questions involving fusion of multiple key concepts.*

Miscellaneous

Diagram Based Questions

**Diagram based questions** include challenging questions based on important diagrams/ figures in the chapter.

*This is our attempt to facilitate students' conceptual understanding and enhance their spatial thinking ability.*

**Evaluation Test** covers questions from chapter for self-evaluation purpose.

*This is our attempt to provide the students with a practice test and help them assess their range of preparation of the chapter.*

Evaluation test

## MHT-CET PAPER PATTERN

- There will be three papers of Multiple Choice Questions (MCQs) in 'Mathematics', 'Physics and Chemistry' and 'Biology' of 100 marks each. Duration of each paper will be 90 minutes.
- Questions will be based on the syllabus prescribed by Maharashtra State Board of Secondary and Higher Secondary Education with approximately 20% weightage given to Std. XI and 80% weightage will be given to Std. XII curriculum.
- Difficulty level of questions will be at par with JEE (Main) for Mathematics, Physics, Chemistry and at par with NEET for Biology.
- There will be no negative marking.
- Questions will be mainly application based.
- Details of the papers are as given below:

Paper	Subject	Approximate No. of Multiple Choice Questions (MCQs) based on		Mark(s) Per Question	Total Marks
		Std. XI	Std. XII		
Paper I	Mathematics	10	40	2	100
Paper II	Physics	10	40	1	100
	Chemistry	10	40		
Paper III	Biology	20	80	1	100

- Questions will be set on
  - the entire syllabus of Std. XII of Physics, Chemistry, Mathematics and Biology subjects, excluding portion which is deleted by Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune for HSC Examination due to Covid 19 Pandemic situation and
  - chapters / units from Std. XI curriculum as mentioned below:

Sr. No.	Subject	Chapters / Units of Std. XI
1	Physics	Motion in a plane, Laws of motion, Gravitation, Thermal properties of matter, Sound, Optics, Electrostatics, Semiconductors
2	Chemistry	Some Basic Concepts of Chemistry, Structure of Atom, Chemical Bonding, Redox Reactions, Elements of Group 1 and Group 2, States of Matter: Gaseous and Liquid States, Basic Principles and techniques of Chemistry, Adsorption and Colloids, Hydrocarbons
3	Mathematics	Trigonometry - II, Straight Line, Circle, Measures of Dispersion, Probability, Complex Numbers, Permutations and Combinations, Functions, Limits, Continuity
4	Biology	Biomolecules, Respiration and Energy Transfer, Human Nutrition, Excretion and osmoregulation

# CONTENTS

Sr. No.	Textbook Chapter No.	Chapter Name	Page No.
<b>Std. XI</b>			
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2	13	Respiration and Energy Transfer	15
3	14	Human Nutrition	27
4	15	Excretion and Osmoregulation	40
<b>Std. XII</b>			
5	1	Reproduction in Lower and Higher Plants	59
6	2	Reproduction in Lower and Higher Animals	85
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8	4	Molecular Basis of Inheritance	147
9	5	Origin and Evolution of Life	174
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**Note:** *Subtopics belonging to the reduced syllabus are represented with <sup>®</sup> mark. Questions of Standard XI are indicated by ‘\*’ in each Model Question Paper.*

## Disclaimer

This reference book is transformative work based on XI and XII Std. Biology Textbook; Reprint 2021 and Reprint: 2021 respectively, published by the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune. We the publishers are making this reference book which constitutes as fair use of textual contents which are transformed by adding and elaborating, with a view to simplify the same to enable the students to understand, memorize and reproduce the same in examinations.

This work is purely inspired upon the course work as prescribed by the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune. Every care has been taken in the publication of this reference book by the Authors while creating the contents. The Authors and the Publishers shall not be responsible for any loss or damages caused to any person on account of errors or omissions which might have crept in or disagreement of any third party on the point of view expressed in the reference book.

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# 13 Organisms and Populations

## Subtopics

- 13.0 Introduction
- 13.1 Organisms and the Environment Around
- 13.2 Major Abiotic Factors
- 13.3 Adaptation
- 13.4 Population
- 13.5 Population Interactions

### Commensalism

The term commensalism was coined in 1876 by Belgian paleontologist and zoologist Pierre-Joseph van Beneden. The word commensalism comes from the Latin word "commensalis", which means "sharing a table".



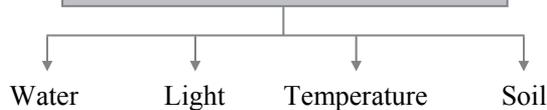
### Quick Review

#### Ecological Hierarchy

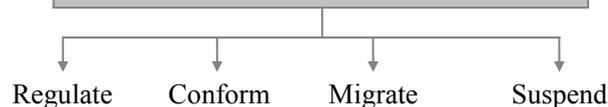
Organism → Population → Community → Ecosystem → Biome

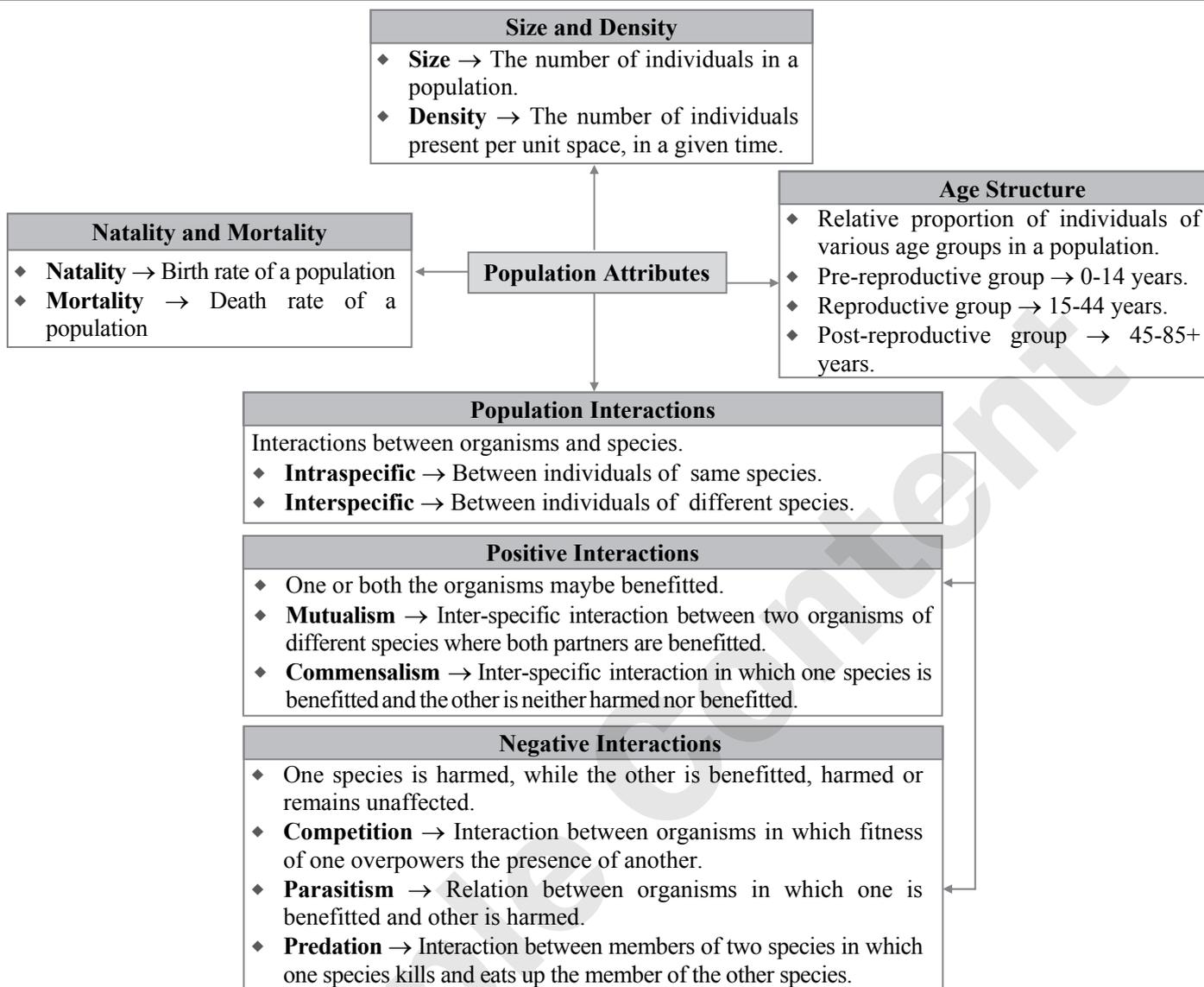
Habitat	Niche
A habitat is an area, where a species lives and interact with the other factors and prosper.	Niche not only describes the position of a species in an environment but also describes the functional role played by an organism.
Habitat deals with effects of temperature, rainfall and other abiotic factors.	Niche deals with the flow of energy from one organism to another.
Habitat supports numerous species at a time.	Niche supports a single species at a time.
Habitat is a physical place.	Niche is an activity or role performed by organisms.
Habitat is not species specific.	Niche is species specific.

#### Abiotic factors influencing habitat



#### Responses of organisms to abiotic factors





### Classical Thinking



#### 13.0 Introduction

1. The study of inter-relationship between living organisms and their environment is called
  - (A) ecosystem
  - (B) demography
  - (C) ecology
  - (D) natality
2. Which of the following correctly represents ecological hierarchy?
  - (A) Organisms→Population→Biome→Community
  - (B) Biome→Community→Organisms→Population
  - (C) Population→Organisms→Community→Biome
  - (D) Organisms→Population→Community→Biome

3. \_\_\_\_\_ constitutes a large regional terrestrial unit delimited by a specific climatic zone having major vegetation zone (plant communities) and the associated fauna.
  - (A) Ecology
  - (B) Biome
  - (C) Population
  - (D) Species



#### 13.1 Organisms and the Environment Around

4. Biome with least rainfall and high temperature is
  - (A) Coniferous forest
  - (B) Desert
  - (C) Arctic and Alpine Tundra
  - (D) Tropical forest
5. Find out ODD one with respect to component of an ecosystem.
  - (A) Pathogens
  - (B) Temperature
  - (C) Predators
  - (D) Parasites



6. The place where a particular organism lives is called its  
(A) factor (B) niche  
(C) habitat (D) environment
7. The term \_\_\_\_\_ is used to denote the functional role played by an organism.  
(A) biome (B) microhabitat  
(C) habitat (D) niche
8. The term 'niche' was first used by  
(A) Guillard (B) Grinnell  
(C) Gause (D) Dr. Des Voeux
9. The species creates its own unique niche in an ecosystem because  
(A) many species share the same niche  
(B) it helps to reduce competition for resources among species  
(C) it helps to increase competition among species living in same habitat  
(D) none of these
10. \_\_\_\_\_ deals with the physical space occupied by the organisms.  
(A) Habitat niche (B) Spatial niche  
(C) Trophic niche (D) both (A) and (B)
11. Position of the organism in the environmental gradients is called  
(A) habitat niche  
(B) spatial niche  
(C) trophic niche  
(D) hyper volume niche
12. The key abiotic factors that influence any habitat are  
(A) temperature (B) soil and water  
(C) light (D) all of these

### 13.2 Major Abiotic Factors

13. The organisms which can tolerate and thrive in a wide range of temperature are called  
(A) eurythermal (B) stenothermal  
(C) euryhaline (D) stenohaline
14. The dissolved salt concentration is \_\_\_\_\_ in fresh waters of streams.  
(A) 5 ppt  
(B) 50 ppt  
(C) 30-35 ppt  
(D) more than 100 ppt
15. The organisms which are tolerant for a wide range of salinities are called  
(A) eurythermal (B) stenothermal  
(C) euryhaline (D) stenohaline
16. \_\_\_\_\_ are restricted to a narrow range of salinities.  
(A) Stenohaline (B) Eurythermal  
(C) Euryhaline (D) Stenothermal

17. Read the given statements and select the correct option.

**Statement I:** Light is not only necessary for plants but also required by animals too.

**Statement II:** Animals use diurnal and seasonal variations in light intensity and duration (photoperiod) as clues for timing their foraging, reproductive and migratory activities.

The correct statement/s is/are

- (A) statement I  
(B) statement II  
(C) both statement I and II  
(D) neither statement I nor II
18. Properties of soil that determine the vegetations of an area are  
(A) mineral composition  
(B) pH  
(C) water holding capacity  
(D) all of these
19. An ability of organism to maintain the constancy of its internal environment despite varying external environmental conditions is called  
(A) dormancy (B) conformation  
(C) homeostasis (D) hibernation
20. The organisms which are able to maintain homeostasis by physiological and behavioural changes are called  
(A) Conformers  
(B) Eurythermals  
(C) Regulators  
(D) Stenothermals
21. In many plants, the seed undergoes a period of suspended growth and does not germinate as soon as it is formed, such condition is called  
(A) hibernation (B) dormancy  
(C) aestivation (D) conformation
22. Polar bears cannot migrate to avoid unfavourable conditions during winter in polar regions, hence they undergo  
(A) hibernation (B) regulation  
(C) dormancy (D) conformation
23. Complete the analogy.  
Winter : Hibernation :: Summer : \_\_\_\_\_  
(A) Dormancy (B) Migration  
(C) Conformation (D) Aestivation

### 13.3 Adaptation

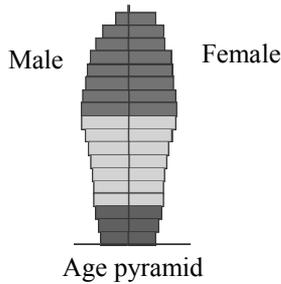
24. Desert plants show following adaptations, EXCEPT  
(A) thick cuticle on their leaf  
(B) stomata in deep pits  
(C) leaves reduced to spines  
(D) lack CAM pathway



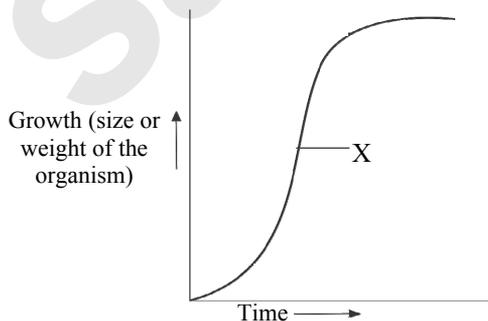
25. Which of the following is the correct example of Allen's Rule?  
 (A) *Opuntia* has leaves reduced to spines  
 (B) Mammals in colder climates have shorter snout, ears and tail  
 (C) Desert lizards show behavioural modifications to regulate body temperature  
 (D) Some species of animals burrow in sand to escape heat
26. Some species in desert, burrow into the sand to hide and escape from the heat, such adaptation is  
 (A) morphological adaptation  
 (B) physiological adaptation  
 (C) behavioural adaptation  
 (D) none of these
- 13.4 Population**
27. \_\_\_\_\_ is an important area of ecology which links ecology to population dynamics, genetics and evolution.  
 (A) Absolute natality  
 (B) Realised mortality  
 (C) Population ecology  
 (D) Sex ratio
28. Which of the following are characteristics of population?  
 (A) Immigration (B) Natality  
 (C) Mortality (D) All of these
29. \_\_\_\_\_ is the number of individuals present per unit space in a given time.  
 (A) Natality  
 (B) Population density  
 (C) Population size  
 (D) Sex ratio
30. \_\_\_\_\_ is the birth rate of a population.  
 (A) Natality  
 (B) Mortality  
 (C) Sex ratio  
 (D) Population dynamics
31. The number of births under ideal conditions with no competition, abundance of resources such as food and water, etc. is called  
 (A) Realised Natality  
 (B) Absolute Mortality  
 (C) Realised Mortality  
 (D) Absolute Natality
32. \_\_\_\_\_ is the death rate of a population.  
 (A) Natality  
 (B) Mortality  
 (C) Sex ratio  
 (D) Population dynamics
33. \_\_\_\_\_ is the ratio of the number of individuals of one sex to that of the other sex.  
 (A) Birth ratio (B) Sex ratio  
 (C) Age ratio (D) Population ratio
34. The males and females in a ratio of \_\_\_\_\_ is generally the most common evolutionary stable strategy (ESS).  
 (A) 2:1 (B) 1:1  
 (C) 1:2 (D) 3:1
35. If the age distribution is plotted for the population, the resulting structure is called  
 (A) sigmoid growth curve  
 (B) age census  
 (C) age pyramid  
 (D) exponential growth curve
36. Which of the following age groups fall in the pre-reproductive age category?  
 (A) 16–59 years (B) 23–54 years  
 (C) 0–14 years (D) 50–60 years
37. The reproductive age category includes individuals of age group  
 (A) 23 – 54 years (B) 15 – 44 years  
 (C) 28 – 35 years (D) 20 – 65 years
38. Select the INCORRECT statement.  
 (A) Population density of birds or insects is measured by the number of these species caught per trap.  
 (B) When only few animals feed on millions of termites, it can be said that the population density of predators is low.  
 (C) In our national parks and tiger reserves, tiger census is based on pug marks and fecal pellets.  
 (D) Population density need not necessarily be measured in numbers only.
39. Which of the following factors can cause change in population size?  
 (A) Food  
 (B) Predation pressure  
 (C) Adverse weather  
 (D) All of these
40. Population having large number of individuals of the pre-reproductive age group is called  
 (A) rapidly growing population  
 (B) steady population  
 (C) declining population  
 (D) reproductive isolation
41. Population having larger number of post reproductive and small number of pre-reproductive age group is called  
 (A) growing population  
 (B) steady population  
 (C) declining population  
 (D) reproductive isolation



42. The given figure of age pyramid represents \_\_\_\_\_ growth.



- (A) rapid (B) slow  
(C) negative (D) zero
43. Population growth of a country depends upon  
(A) birth and death rates  
(B) death rate and emigration  
(C) birth rate and immigration  
(D) all of the above
44. \_\_\_\_\_ is the number of individuals of the same species that have come into the habitat from elsewhere during the time period under consideration.  
(A) Immigration (B) Emigration  
(C) Growth rate (D) Natality
45. \_\_\_\_\_ is the number of individuals of population who left the habitat during the time period.  
(A) Mortality (B) Emigration  
(C) Natality (D) Immigration
46. In which of the following condition exponential growth can be seen?  
(A) When resources in the habitat are unlimited  
(B) When each species has the ability to fully realize its innate potential to grow in numbers  
(C) When food and space are limited  
(D) Both (A) and (B)
47. Identify label 'X' in the given figure of logistic growth curve of population.



- (A) Stationary phase  
(B) Log phase  
(C) Lag phase  
(D) Diminishing growth phase

48. In a habitat with limited resources, logistic growth curve shows \_\_\_\_\_ phase when the population density reaches the carrying capacity.  
(A) stationary phase  
(B) log phase  
(C) lag phase  
(D) exponential phase

### 13.5 Population Interactions

49. The biological interaction between organisms of same population is called  
(A) interspecific interaction  
(B) intraspecific interaction  
(C) intragenetic interaction  
(D) detrimental interaction
50. Which of the following is negative interaction?  
(A) Mutualism  
(B) Commensalism  
(C) Competition  
(D) Protocooperation
51. Mutualism between two species can be represented as  
(A) +, - (B) -, -  
(C) +, + (D) +, 0
52. Biological interaction between organisms of different species in which each individual receives benefit is called  
(A) commensalism (B) amensalism  
(C) parasitism (D) mutualism
53. Mutualism is an interaction between two species in which  
(A) both are harmed  
(B) both benefit  
(C) one benefits and the other is neither helped nor harmed  
(D) one benefits and the other is harmed
54. Which of the following represents mutualism?  
(A) interaction between algae and fungi in lichen  
(B) tiger chasing deer  
(C) interaction between *Cuscuta* plant with host plant  
(D) interaction between sea anemone and clown fish
55. An interaction between organisms or species in which the fitness of one overpowers the presence of another is called  
(A) mutualism (B) commensalism  
(C) competition (D) parasitism
56. "Two closely related species competing for the same resources cannot co-exist indefinitely and the competitively inferior will be eliminated eventually." This statement is a



- (A) Charles Darwin's "survival of the fittest" theory  
 (B) theory of organic evolution  
 (C) Gause's competitive exclusion principle  
 (D) Mutation theory
57. If two species compete for the same resource, they could avoid competition by choosing different times for feeding. This is an example of  
 (A) commensalism  
 (B) resource partitioning  
 (C) ammensalism  
 (D) competitive exclusion principle
58. Relationship between organisms of different species where one organism is benefited and other is harmed is called  
 (A) mutualism (B) commensalism  
 (C) parasitism (D) symbiosis
59. Parasitism between species A and B can be represented by following sign.  
 (A) +, - (B) -, -  
 (C) +, + (D) +, 0
60. Many parasites have evolved to be host specific which means  
 (A) they can parasitize higher animals  
 (B) they can parasitize many hosts at the same time  
 (C) they can parasitize only a single species of host.  
 (D) they can parasitize only single individual of a population.
61. Which of the following adaptations are evolved by endoparasites?  
 (A) Loss of unnecessary sense organs.  
 (B) Presence of adhesive organs or suckers to cling onto the host.  
 (C) Loss of digestive system and high reproductive capacity.  
 (D) All of these
62. An organism which carries another organism to host is called  
 (A) parasite (B) vector  
 (C) pathogen (D) viroid
63. The malarial parasite *Plasmodium vivax* needs a \_\_\_\_\_ vector to spread to other hosts.  
 (A) human (B) mosquito  
 (C) arthropod (D) tick
64. Select the INCORRECT statement from the following.  
 (A) Parasites may reduce the survival, growth and reproduction of the host and may lead to death of the host.  
 (B) Majority of the parasites do not harm the host.  
 (C) Parasites may cause reducing population density of host.  
 (D) Parasites might render the host more vulnerable to predation by making it physically weak.
65. Ectoparasites are the parasites which live  
 (A) in the intercellular spaces of host.  
 (B) on the external surface of the host.  
 (C) within the cells in the hosts body.  
 (D) in the endodermis of the host.
66. All are examples of ectoparasites, EXCEPT  
 (A) Copepods – Marine fishes  
 (B) *Cuscuta* – Hedge plant  
 (C) Ticks – Dog  
 (D) *Plasmodium vivax* – Human
67. A type of parasitism in which parasitic bird lays its egg in the nest of its host bird is called  
 (A) brood parasitism (B) camouflage  
 (C) endoparasitism (D) commensalism
68. Brood parasitism is exhibited by  
 (A) Lion and leopard competing for the same resource  
 (B) Marine fishes infested by copepods  
 (C) Asian koel and common Indian crow  
 (D) *Cuscuta* plant deriving nutrition from host plant
69. What will happen if predators become extinct from a particular ecosystem?  
 (A) Prey population will start reducing.  
 (B) Prey species would reach very high population densities.  
 (C) Ecosystem without predators leads to stable ecosystem as host species will grow abundantly.  
 (D) This would help in maintaining species diversity in a community
70. Biological control methods adopted in agricultural pest control are based on  
 (A) mimicry (B) predation  
 (C) brood parasitism (D) commensalism
71. Predators are prudent in nature because  
 (A) if predator over exploits its prey then the prey might become extinct  
 (B) if prey becomes extinct then predators will also become extinct due to lack of food  
 (C) if predator becomes extinct then species diversity in a community increases  
 (D) both (A) and (B)
72. Adaptation in which organism matches its colour with surrounding to get protected from predators is called  
 (A) mimicry (B) camouflage  
 (C) brood parasitism (D) commensalism



73. Which of the following plant shows morphological means of defence to avoid herbivores?  
 (A) Thorns in *Acacia*  
 (B) Cardiac glycosides in *Calotropis*  
 (C) Secondary metabolites like opium, quinine, etc  
 (D) None of these
74. \_\_\_\_\_ is an interaction in which one species is benefited and other is neither harmed nor benefited.  
 (A) Predation (B) Competition  
 (C) Mutualism (D) Commensalism
75. Identify the type of biological interaction shown in the given picture.
- 
- (A) Brood parasitism (B) Commensalism  
 (C) Competition (D) Predation
76. The orchid growing as epiphyte on tree is good example of  
 (A) parasitism (B) mutualism  
 (C) competition (D) commensalism

**Critical Thinking****13.1 Organisms and the Environment Around**

1. Which of the following is WRONG with respect to Niche?  
 (A) Niche deals with the flow of energy from one organism to another.  
 (B) Niche supports numerous species at a time.  
 (C) Niche is an activity performed by organisms.  
 (D) Niche is species specific.
2. \_\_\_\_\_ niche is the niche in the absence of all competitors, whereas \_\_\_\_\_ niche is in the presence of competition for the resources available in the habitat.  
 (A) Realized, fundamental  
 (B) Fundamental, trophic  
 (C) Fundamental, realized  
 (D) Realized, hypervolume

**13.2 Major Abiotic Factors**

3. Polar bears are restricted to a narrow range of temperature hence they are  
 (A) eurythermal (B) stenothermal

(C) euryhaline (D) stenohaline

4. Select the correct match from the following with respect to water body and dissolved salt concentration.  
 (A) Lake – 30 ppt  
 (B) Sea – 5 ppt  
 (C) River – 35 ppt  
 (D) Hypersaline lagoons – up to 100ppt

**13.3 Adaptation**

5. Select the INCORRECT statement about *Opuntia*.  
 (A) Leaves are reduced to spines.  
 (B) Leaf spines perform the function of photosynthesis.  
 (C) *Opuntia* show CAM pathway.  
 (D) Stomata remains closed during day time.
6. Read the given statement with respect to adaptation in polar animals like seal.  
 i. They have thick layer of fat below skin.  
 ii. Blubber below seal's skin allows heat from outside to enter into the body.  
 The correct statement/s is/are  
 (A) statement i only  
 (B) statement ii only  
 (C) both statement i and ii  
 (D) neither statement i nor ii
7. Match Column I with Column II and choose the correct option.

	I		II
i.	Behavioural adaptation	a.	Desert plants have CAM pathway
ii.	Morphological adaptation	b.	Mammals from colder climates have shorter snout, tail, ears and limbs
iii.	Physiological adaptation	c.	Desert lizards bask in the sun to absorb heat and move to shade when ambient temperature increases

- (A) i – a, ii – c, iii – b (B) i – a, ii – b, iii – c  
 (C) i – c, ii – b, iii – a (D) i – c, ii – a, iii – b

**13.4 Population**

8. Select the INCORRECT pair from the following.  
 (A) Absolute mortality- The number of deaths under ideal conditions  
 (B) Crude birth rate- Used to calculate population size  
 (C) Realised mortality-The number of deaths when environmental pressures come into play.  
 (D) Realised natality- The number of births under ideal conditions



9. Select the INCORRECT statement from the following.
- Mortality rate or death rate is a measure of the number of deaths in a particular population, in proportion to the size of that population, per unit of time.
  - Absolute mortality is the number of deaths when environmental pressure comes into play.
  - Mortality rate is typically expressed in deaths per 1,000 individuals per year.
  - Absolute mortality is always less than realized mortality.
10. Which of the following leads to increase in population density?
- Increased emigration and decreased immigration
  - Increased immigration and natality
  - Decreased mortality and increased emigration
  - Decreased immigration and natality
11. Which of the following correctly represents population density at time  $t+1$ ?
- $[N_{t+1} = N_t + [(B - I) + (D + E)]]$
  - $[N_{t+1} = N_t - [(B - I) + (D - E)]]$
  - $[N_{t+1} = N_t + [(B + I) - (D + E)]]$
  - $[N_{t+1} = N_t + [(I - D) - (B - E)]]$
12. In the given equation 'N' indicates  
 $[N_{t+1} = N_t + [(B + I) - (D + E)]]$
- natality
  - new births
  - mortality
  - population density
13. 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
- 10
  - 15
  - 05
  - Zero
14. Logistic growth model is considered a more realistic one, because
- resources for growth of animal population are infinite
  - as population density increases, competition for resources decreases
  - resources for growth of animal population are finite and become limiting sooner or later
  - none of these is true
15. If species A is harmed and species B is unaffected then such an interaction is called
- competition
  - amensalism
  - mutualism
  - parasitism
16. Select the INCORRECT pair from the following.
- Mutualism- Both species are benefited
  - Commensalism- one species benefited and other is neither benefited nor harmed
  - Parasitism- interaction is detrimental to parasite
  - Competition-both species are harmed
17. Mutualism is a kind of \_\_\_\_\_ interaction.
- positive interspecific
  - negative interspecific
  - positive intraspecific
  - negative intraspecific
18. The energy flow from one animal to another is due to
- competition
  - mutualism
  - predation
  - commensalism
19. **Assertion:** Monarch butterfly is highly distasteful to its predator.  
**Reason:** Monarch butterfly acquires chemical during its caterpillar stage by feeding on a poisonous weed.
- Both assertion and reason are true and reason is the correct explanation of assertion.
  - Both assertion and reason are true but reason is not the correct explanation of assertion.
  - Assertion is true but reason is false.
  - Both assertion and reason are false.
20. Which of the following is true for the given picture?



- In this interaction both sea anemone and clown fish are benefited.
- Clown fish gets protection from predators while anemone is neither benefited nor harmed.
- The interaction between sea anemone and clown fish is an example of mutualism.
- In this interaction Clown fish is benefited as it derives nutrition from tentacles of sea anemone causing harm to it.



### 13.5 Population Interactions



## Competitive Thinking



## 13.1 Organisms and the Environment Around

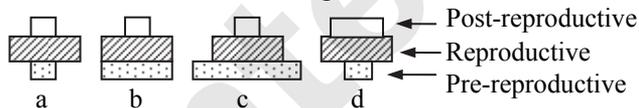
- In an ecosystem each organism occupies a particular place and has a functional role and it is known as [TS EAMCET 2018]  
(A) Ecological Pyramid (B) Ecotone  
(C) Ecological Niche (D) Habitat
- Niche is [NEET (UG) 2018]  
(A) the range of temperature that the organism needs to live  
(B) the physical space where an organism lives  
(C) all the biological factors in the organism's environment  
(D) the functional role played by the organism where it lives



## 13.4 Population

- Natality refers to [NEET (UG) 2018]  
(A) Number of individuals leaving the habitat  
(B) Birth rate  
(C) Death rate  
(D) Number of individuals entering a habitat
- Density of population increases when \_\_\_\_\_. [MHT CET 2017]  
(A) Emigration increases  
(B) Immigration decreases  
(C) Mortality increases  
(D) Natalty increases
- The impact of immigration on population density is [NEET (UG) P-II 2020]  
(A) Both positive and negative  
(B) Neutralized by natalty  
(C) Positive  
(D) Negative
- Density of population increases when \_\_\_\_\_. [MHT CET 2018]  
(A) Mortality and emigration increases  
(B) Natalty and immigration increases  
(C) Mortality increases and immigration decreases  
(D) Natalty decreases and emigration increases
- Which of the following is NOT an attribute of a population? [NEET (UG) P-I 2020]  
(A) Natalty  
(B) Mortality  
(C) Species interaction  
(D) Sex ratio
- In a growing population of a country, [NEET (UG) 2018]  
(A) reproductive and pre-reproductive individuals are equal in number.  
(B) reproductive individuals are less than the post-reproductive individuals.

- pre-reproductive individuals are more than the reproductive individuals.
  - pre-reproductive individuals are less than the reproductive individuals.
- One of the following causes population explosion [KCET 2014]  
(A) Decrease in infant mortality rate and increase in death rate.  
(B) Decrease in death rate, maternal mortality rate and infant mortality rate.  
(C) Decrease in infant mortality rate and decrease in the number of people in reproductive age.  
(D) Decrease in death rate and increase in maternal mortality rate.
  - Which of the following statements correctly correlates with the diagrams?



- [MH CET 2014]
- a and b are steady population
  - a and d are declining population
  - c and d are growing population
  - b and d are declining population



## 13.5 Population Interactions

- 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 [NEET (Odisha) 2019]  
(A) Competitive exclusion  
(B) Character displacement  
(C) Altruism  
(D) Resource partitioning
- Which one of the following population interactions is widely used in medical science for the production of antibiotics? [NEET (UG) 2018]  
(A) Parasitism (B) Mutualism  
(C) Commensalism (D) Amensalism
- The interaction between the organisms of one of the following pairs is an example for commensalism: [KCET 2014]  
(A) Cattle or sheep and grass  
(B) Wasps and fig tree  
(C) Orchid and mango tree  
(D) Cuckoo and crow
- The interaction observed in this diagram is [MHT CET 2016]



- Commensalism (B) Competition  
(C) Mutualism (D) Predation



15. Select the CORRECT match:

	I		II
i.	Competition	a.	Tapeworm and man
ii.	Commensalism	b.	Lichen
iii.	Mutualism	c.	Cattle egret and cattle
iv.	Parasitism	d.	Lions and Leopards

[MHT CET 2016]

- (A) i - d, ii - c, iii - b, iv - a  
 (B) i - d, ii - b, iii - c, iv - a  
 (C) i - c, ii - b, iii - d, iv - a  
 (D) i - a, ii - b, iii - d, iv - c

16. Match the items in Column I with those in Column II.

	Column I		Column II
i.	Herbivores-Plants	a.	Commensalism
ii.	Mycorrhiza-Plants	b.	Mutualism
iii.	Sheep-Cattle	c.	Predation
iv.	Orchid-Tree	d.	Competition

Select the correct option from following:

[NEET (UG) P-II 2020]

- (A) (i)-(c), (ii)-(b), (iii)-(d), (iv)-(a)  
 (B) (i)-(b), (ii)-(a), (iii)-(c), (iv)-(d)  
 (C) (i)-(a), (ii)-(c), (iii)-(d), (iv)-(b)  
 (D) (i)-(d), (ii)-(b), (iii)-(a), (iv)-(c)

17. If '+' sign is assigned to beneficial interaction, '-' sign to detrimental and '0' sign to neutral interaction, then the population interaction represented by '+', '-' refers to

[NEET P-II 2016]

- (A) Parasitism (B) Mutualism  
 (C) Amensalism (D) Commensalism

18. In spite of interspecific competition in nature, which mechanism the competing species might have evolved for their survival?

[NEET (UG) 2021]

- (A) Predation  
 (B) Resource partitioning  
 (C) Competitive release  
 (D) Mutualism

19. A cuckoo laying eggs in the nest of other species of birds, is an example of [MH CET 2015]

- (A) Adelphoparasitism (B) Brood parasitism  
 (C) Ectoparasitism (D) Hyperparasitism

20. The principle of competitive exclusion was stated by [NEET P-II 2016]

- (A) Verhulst and Pearl (B) C. Darwin  
 (C) G.F. Gause (D) MacArthur

21. Gause's principle of competitive exclusion states that [NEET P-I 2016]

- (A) no two species can occupy the same niche indefinitely for the same limiting resources.  
 (B) larger organisms exclude smaller ones through competition  
 (C) more abundant species will exclude the less abundant species through competition.  
 (D) competition for the same resources excludes species having different food preferences.

22. Between which among the following, the relationship is NOT an example of commensalism? [NEET (Odisha) 2019]

- (A) Female wasp and fig species  
 (B) Orchid and the tree on which it grows  
 (C) Cattle Egret and grazing cattle  
 (D) Sea Anemone and Clown Fish



### Miscellaneous

23. World Ozone Day is celebrated on

[NEET (UG) 2018]

- (A) 16<sup>th</sup> September (B) 21<sup>st</sup> April  
 (C) 5<sup>th</sup> June (D) 22<sup>nd</sup> April



## Answer Key



### Classical Thinking

1. (C) 2. (D) 3. (B) 4. (B) 5. (B) 6. (C) 7. (D) 8. (B) 9. (B) 10. (D)  
 11. (D) 12. (D) 13. (A) 14. (A) 15. (C) 16. (A) 17. (C) 18. (D) 19. (C) 20. (C)  
 21. (B) 22. (A) 23. (D) 24. (D) 25. (B) 26. (C) 27. (C) 28. (D) 29. (B) 30. (A)  
 31. (D) 32. (B) 33. (B) 34. (B) 35. (C) 36. (C) 37. (B) 38. (B) 39. (D) 40. (A)  
 41. (C) 42. (C) 43. (D) 44. (A) 45. (B) 46. (D) 47. (B) 48. (A) 49. (B) 50. (C)  
 51. (C) 52. (D) 53. (B) 54. (A) 55. (C) 56. (C) 57. (B) 58. (C) 59. (A) 60. (C)  
 61. (D) 62. (B) 63. (B) 64. (B) 65. (B) 66. (D) 67. (A) 68. (C) 69. (B) 70. (B)  
 71. (D) 72. (B) 73. (A) 74. (D) 75. (B) 76. (D)



### Critical Thinking

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



## Competitive Thinking

1. (C) 2. (D) 3. (B) 4. (D) 5. (C) 6. (B) 7. (C) 8. (C) 9. (B) 10. (B)  
 11. (D) 12. (D) 13. (C) 14. (D) 15. (A) 16. (A) 17. (A) 18. (B) 19. (B) 20. (C)  
 21. (A) 22. (A) 23. (A)



## Evaluation Test

1. Which of the following is not a dynamic of population?  
 (A) Natality (B) Mortality  
 (C) Sex ratio (D) Niche
2. Humans are  
 (A) Stenothermal (B) Euryhaline  
 (C) Eurythermal (D) Stenohaline
3. Population grows due to  
 (A) natality + emigration  
 (B) natality + immigration  
 (C) mortality + immigration  
 (D) mortality + emigration
4. Select the INCORRECT statement from the following.  
 (A) Habitat is a physical place  
 (B) Habitat is species specific  
 (C) Habitat consists of numerous niches  
 (D) Habitat is the physical space of an organism
5. In Germany, pre-reproductive population is very less as compared to reproductive and post-reproductive population, hence it shows \_\_\_\_\_ age pyramid.  
 (A) negative (B) rapid growth  
 (C) slow growing (D) positive
6. If increase and decrease in mortality are designated as  $M^+$  and  $M^-$  and increase and decrease in natality as  $N^+$  and  $N^-$ , then the increase in population can be denoted as  
 (A)  $M^+$  and  $N^+$  (B)  $M^-$  and  $N^-$   
 (C)  $M^-$  and  $N^+$  (D)  $M^+$  and  $N^-$
7. Flamingos compete with resident fishes in shallow creeks of Mumbai for their common food zooplanktons. This is an example of  
 (A) Parasitism (B) Mutualism  
 (C) Competition (D) Commensalism
8. Read the given statements and select the correct option.  
 i. Habitat is not species specific.  
 ii. Numerous species can share the same niche.  
 The correct statement/s is/are  
 (A) only i (B) only ii  
 (C) both i and ii (D) neither i nor ii
9. In lichens, mutualism is seen between  
 (A) algae and host plant  
 (B) algae and fungus  
 (C) fungus and host plant  
 (D) lichen and substratum
10. Identify the type of interaction shown in the given picture.  
  
 (A) Brood Parasitism (B) Endoparasitism  
 (C) Predation (D) Mutualism
11. Population density means  
 (A) the number of humans per unit area.  
 (B) the number of individuals in a unit area at a specific time.  
 (C) the concentration of human population at a place.  
 (D) none of the above
12. \_\_\_\_\_ is the cryptic coloration or patterns adapted by prey species to blend with the surroundings or background so as to escape their predators.  
 (A) Parasitism (B) Camouflage  
 (C) Predation (D) Mutualism
13. Organisms that can tolerate and thrive in wide range of salinities are called  
 (A) eurythermal (B) stenothermal  
 (C) stenohaline (D) euryhaline
14. Seeds do not germinate and reduce their metabolic activity during  
 (A) hibernation (B) aestivation  
 (C) conformation (D) dormancy
15. Which of the following interaction can be represented as '+, +'?  
 (A) Commensalism (B) Mutualism  
 (C) Amensalism (D) Parasitism



## Answers to Evaluation Test

1. (D) 2. (C) 3. (B) 4. (B)  
 5. (A) 6. (C) 7. (C) 8. (A)  
 9. (B) 10. (A) 11. (B) 12. (B)  
 13. (D) 14. (D) 15. (B)



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