



BIOLOGY

BOTANY AND ZOOLOGY FOR NEET AND AIIMS

ORGANISMS AND POPULATIONS

Exercise I Ecology And Its Importance

1. Autecology is the

A. relation of heterogeneous population to its environment

B. relation of an individual to its environment

C. relation of a community to its environment

D. relation of a biome to its environment

Answer: B



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2. Ecotone is

A. a polluted area

B. the bottom of a lake

C. a zone of transition between two communities

D. a zone of developing community

Answer: C



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3. Biosphere is

- A. a component in the ecosystem
- B. composed of the plants present on the soil
- C. life in the outer space
- D. composed of all living organisms present on earth which interact with the physical environment

Answer: D





4. Ecological niche is

- A. the surface area of the ocean
- B. an ecologically adapted zone
- C. the physical position and functional role of a species within the community
- D. formed of all plants and animals living at the bottom of a lake

Answer: C



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5. Formation of tropical forests needs mean annual temperature and mean annual precipitation as

A. $8 - 25^{\circ}\text{C}$ and 15.0-400 cm

B. $5 - 15^{\circ}\text{C}$ and 50-100 cm

C. $30 - 50^{\circ}\text{C}$ and 100-150 cm

D. $5 - 15^{\circ}\text{C}$ and 100-200 cm

Answer: A



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6. Study of adaptation of organisms to their environments in terms of survival and reproduction is called

A. Zoogeography

B. physiological ecology

C. Morphology

D. Genetics

Answer: B



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7. Unique habitat for hundreds of species of microbes in man is

A. Kidney

B. Liver

C. Intestine

D. Tongue

Answer: C





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8. Ecology is basically concerned with the following levels of organization

A. Organisms

B. Population and communities

C. Biomes

D. All

Answer: D



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9. Select the correct sequence regarding the levels of organization

A. Cell - Organs - Tissue - Organisms -
Communities - Ecosystem - Population -
Biosphere

B. Organs - Cell - Tissue - Communities --
Organisms - Ecosystem - Population -
Biosphere

C. Tissue - Cell - Population - Organisms -
Ecosystem - Biosphere

D. Cell - Tissue - Organisms - Populations --
Communities - Ecosystems - Biosphere

Answer: D



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10. Which of the following is a ~~chcrpical~~ abiotic factor?

A. Pressure

B. Temperature

C. Salinity

D. Solar radiation

Answer: C



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11. A group of organisms of same species living in a specific area at a specific time is called

A. Community

B. Population

C. Biome

D. Ecosystem

Answer: B



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12. Population density is influenced by

A. Natality

B. Mortality

C. Immigration and emigration

D. All

Answer: D



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13. Terrestrial biomes are

A. Tropical rain forest

B. Coniferous forest

C. Desert, Tundra

D. All

Answer: D



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14. All the habitable zones on the Earth constitute

A. Biosphere

B. Terrestrial biome

C. Aquatic biome

D. Community

Answer: A



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15. The functional aspects of ecosystem are

A. Energy transfer

B. Recycling of minerals

C. Soil and Pressure

D. 1 and 2

Answer: D



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16. The structural aspects of ecosystem include

- A. Abiotic and biotic factors
- B. Physical and chemical factors
- C. Living organisms
- D. All

Answer: D



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Exercise I Organism And Its Environment Introduction

1. Broad leaved trees are found in

- A. Tropical deciduous forest
- B. Mediterranean ever green forest
- C. Temperate ever green forest

D. North coniferous forest

Answer: C



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2. Which of the following account for the formation of major biomes?

A. The rotation of our planet around the Sun and the tilt of its axis

B. Variations in mean annual temperature

C. Variations in annual precipitation

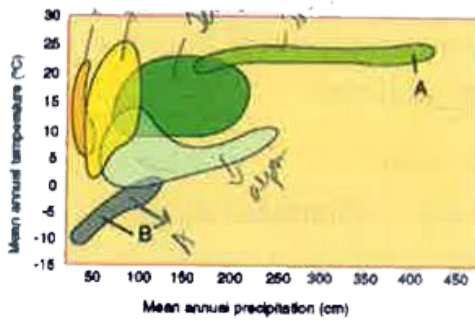
D. all of these

Answer: D



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3. Choose the option that correctly identifies 'A' and 'B' from the following figure.



A

- 1) Temperate forest
- ~~2) Tropical forest~~
- 3) Coniferous forest
- 4) Alpine tundra

B

- Desert
- Alpine tundra
- Grassland
- Desert



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4. The key abiotic factors that lead to so much variation in the physical- and chemical conditions of different habitats are

- A. light , temperature and water
- B. soil, pressure and humidity
- C. producers, consumers and decomposers
- D. light, pressure and predation

Answer: A



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5. Seasonal variations in temperature and duration of light on earth occur due to

A. Rotation of Earth around the Sun

B. Tilt of earth's axis

C. Spinning of earth on its own axis

D. both (1) and (2)

Answer: D



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Exercise I Temperature

1. According to Allen's Rule the mammals from colder climates have

A. shorter ears and longer limbs

B. longer ears and shorter limbs

C. longer ears and longer limbs

D. shorter ears and shorter limbs

Answer: D



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2. Which of the following statements is correct?

A. The average temperature on land varies seasonally

B. The average temperature on land decreases progressively from plains to the mountain tops

C. The average temperature on land decreases progressively from the equator towards the poles

D. All of these

Answer: D



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3. Organisms which can tolerate wide range of fluctuations in temperature are called

A. Eurythermal

B. Stenothermal

C. Euryhaline

D. Stenohaline

Answer: A



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4. Organisms which can tolerate only small variations in temperature are called

A. Stenohaline

B. Euryhaline

C. Eurythermal

D. Stenothrmal

Answer: D



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5. Optimum temperature is the temperature at which organism's life activities

A. are at minimum level

B. begin

C. are at maximum level

D. stop

Answer: C



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6. Choose the correct match.

A. Corals - eurythermal

B. Man - eurythermal

C. Shark - homeothermic

D. Birds - poikilothermic

Answer: B



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7. Which of the following statements is correct?

A. Mango trees grow in Canada and Germany

B. Snow leopards are found in Kerala forests

C. Tuna fish are generally caught in the ocean beyond tropical latitudes

D. None of these

Answer: D



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8. Study the following statements and select the correct ones.

i) Organisms restricted to a narrow range of temperatures are called eurythermal.

ii) Organisms capable of tolerating a wide range of temperature are called stenothermal organisms.

iii) The levels of thermal tolerance of different species determine to a large extent their geographical distribution.

iv) Temperature affects the kinetics of enzymes.

A. (i) and (ii)

B. iii) and (iv)

C. (i), (ii) and (iii)

D. (i), (ii), (iii) and (iv)

Answer: B



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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

Answer: C



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Exercise I Water

1. Organisms tolerant to wide range of salinities are termed

A. Stenohaline

B. Stenothermal

C. Euryhaline

D. Eurythermal

Answer: C



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2. The salt concentration in inland waters and in the sea water, respectively are

A. More than 5 ppt, 30-35 ppt

B. Zero ppt, 35-45 ppt

C. 30-35 ppt, less than 5 ppt

D. Less than 5 ppt, 30-35 ppt

Answer: D



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3. Leaves are reduced to spines in

A. Opuntia

B. Nymphaea

C. Asparagus

D. both (1) and (2)

Answer: A



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4. Organisms that are restricted to a narrow range of salt concentration are termed

A. euryhaline

B. stenothermal

C. eurythermal

D. stenohaline

Answer: D



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5. If 'A' is a sea, 'B' is a river and 'C' is a hypersaline lagoon, select the option that correctly

specifies the salinities of 'A', 'B' and C.

	A	B	C
1)	5 ppt	35 ppt	105 ppt
2)	30 ppt	4 ppt	105 ppt
3)	100 ppt	3 ppt	35 ppt
4)	35 ppt	105 ppt	5 ppt



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6. Which of the following forest plants controls the light conditions at the ground?

A. Lianas and climbers

B. Shrubs

C. Tall trees

D. Herbs

Answer: C



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Exercise I Light

1. What will happen to a well growing herbaceous plant in the forest if it is transplanted outside the forest in a park?

A. It will grow normally

B. It will grow well because it is planted in
the same locality

C. It may not survive because of change in
its microclimate

D. It grows very well because the plants get
more sunlight

Answer: C



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2. Light is a/an

A. Abiotic - Chemical factor

B. Biotic - Physical factor

C. Abiotic - Physical factor

D. Biotic - Chemical factor

Answer: C



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3. Diurnal and seasonal variations in the intensity and photoperiod of light are cues for

A. Foraging for animals

B. Reproductive and migratory activities in some animals

C. Flowering in plants

D. All

Answer: D



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4. Wavelength of the visible spectrum ranges from

A. 120 nm to 380 nm

B. 260 nm to 450 nm

C. 380 nm to 750 nm

D. 480 nm to 720 nm

Answer: C



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5. Biological response to a change in the proportions of light and darkness in a day is

A. Photoperiodism

B. Phototropism

C. Phototaxis

D. Photokinesis

Answer: A



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6. Read the following statements and select the correct option:

(a) Many species of herbs and shrubs growing in forests are adapted to photosynthesise optimally under very low light conditions.

(b) Many plants are dependent on sunlight to meet their photoperiodic requirement for flowering.

A. Both (a) and (b) are true.

B. (b) is correct but (a) is false.

C. (a) is correct but (b) is false.

D. Both (a) and (b) are false.

Answer: A



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Exercise I Soil

1. The nature and properties of soil depends on

A. Vegetation

B. Climate

C. Weathering

D. 2 and 3

Answer: D



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2. Water holding capacity of the soil depends upon

A. chemical composition of soil

B. particle size of soil

C. aggregation of soil particles

D. all of these

Answer: D



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3. Which of the following statements is incorrect

A. The sediment-characteristics often determine the type of benthic animals that can thrive in aquatic habitat.

B. Soil pH, mineral composition and topography determine the type of animals which, in turn, dictates the type of plants can be supported in an area. `

C. The nature and properties of soil in different places it is dependent on the climate, the weathering proccss, etc.

D. Soil composition, grain size and aggregation determine the percolation and water holding capacity of the soils.

Answer: B



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Exercise I Pressure

1. Identify incorrect statement

- A. In aquatic environment, the sediment - characteristics determine the type of pelagic organisms that can live there
- B. p^H and mineral composition of soil can determine the vegetation in any area
- C. Pressure changes with depth in the ocean
- D. Pressure in the water increases at the rate of 1 atmosphere per lam depth

Answer: A



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Exercise I Response To Abiotic Factors

1. When we are in a hot room, we sweat profusely. It is a __ means of maintaining homeostasis

A. morphological

B. physiological

C. behavioural

D. none of these

Answer: B



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2. Polar bears go into __ during winter.

A. aestivation

B. migration

C. hibernation

D. diapause

Answer: C



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3. All osmoconformers are

A. invertebrates

B. marine animals

C. vertebrates

D. freshwater animals

Answer: B



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4. With respect to body temperature camel may be regarded as

- A. strict conformer
- B. strict regulator
- C. partial conformer
- D. none of the above

Answer: C





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5. Very small size animals are rarely found in'

- A. Tropical region
- B. Sub Tropical region
- C. Polar region
- D. Deserts

Answer: C



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6. Delay in development periods of unfavorable conditions and gets inactiveness is called

A. Menopause

B. Diapause

C. Hibernation

D. Aestivation

Answer: B



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7. Diapause is exhibited by

A. Insects

B. Embryos of some fishes

C. Zooplanktons in lake and ponds

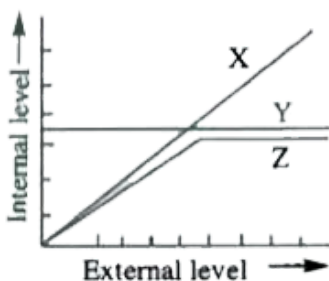
D. all of above

Answer: D



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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



X

Y

Z

- | | | |
|----------------------|-------------------|-------------------|
| 1) regulator | conformer | partial regulator |
| 2) conformer | partial conformer | regulator |
| 3) conformer | regulator | partial regulator |
| 4) partial regulator | regulator | conformer |



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9. Which of the following statements is incorrect?

A. Evolutionary biologists believe that the success of mammals is largely due to their ability to maintain a constant body temperature

B. The mechanisms used by most mammals to regulate their body temperature 'are similar to the ones that humans use

C. Plants do not have such mechanisms to maintain internal temperatures

D. An overwhelming majority of animals and nearly all plants can maintain a constant internal environment.

Answer: D



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10. Read the following statements and select the correct ones.

i) All vertebrates are capable of osmoregulation and thermoregulation.

ii) Some species have evolved the ability to regulate, but only over a limited range of environmental conditions, beyond which they simply conform.

iii) 99 per cent of animals and nearly all plants cannot maintain a constant internal environment. -

iv) Animals are either perfect regulators or perfect conformers.

A. (i) and (ii)

B. (H) and (iii)

C. (iii) and (iv)

D. (i) and (iv)

Answer: B



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11. Many animals have not evolved to become thermoregulators because

A. there are no perfect regulators

B. thermoregulation is energetically expensive process

C. the 'benefit' of thermoregulation is more than the 'cost' they would incur

D. thermoregulators are found only in tropical regions

Answer: B



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12. Some snails, fishes and frogs go into _
during summer.

A. aestivation

B. migration

C. hibernation

D. diapause

Answer: A



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13. Under unfavourable conditions many zooplankton species in lakes and ponds are known to enter a stage of suspended development called

A. aestivation

B. migration

C. hibernation

D. diapause

Answer: D



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14. This is an example of 'escape in space' to avoid stressful external conditions

A. Migration

B. Aestivation

C. Hibernation

D. Diapause

Answer: A



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15. Read the following statements and select the correct option:

(a) Very small animals are rarely found in polar regions.

(b) Small animals have a larger surface area

relative to their volume, they tend to lose body heat very fast when it is cold outside.

A. (b) is correct but (a) is false.

B. Both (a) and (b) are true.

C. (a) is correct but (b) is false.

D. Both (a) and (b) are false.

Answer: B



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16. Adaptations in organisms to cope with extreme environmental conditions include

A. morphological adaptation

B. physiological adaptations

C. behavioural adaptations

D. all the above

Answer: D



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Exercise I Adaptations

1. Which of the following is incorrect?

A. Mammals living in hot climate are large sized

B. Amphibians living in colder regions are large sized

C. Reptiles living in hot climate are small sized

D. Mammals living in warmer places are small sized

Answer: A



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2. Blubber acts an insulator to reduce the loss of heat in

A. Fishes

B. Penguins

C. Seals

D. Camel

Answer: C



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3. Desert lizards bask in the sun when their body temperature drops below the comfort zone, but move into shade when the ambient temperature starts increasing. This is an example of

A. morphological adaptation

B. physiological adaptation

C. behavioural adaptation

D. anatomical adaptation

Answer: C



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4. Adaptations in desert plants include

A. Stomata in deep pits

B. Closure of stomata during day time

C. Reduction of leaves into spines

D. All the above

Answer: D



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5. The animal capable of meeting all water requirements through oxidation of its internal fat is

A. Camel

B. Kangaroo rat

C. Spiny Lizard

D. None

Answer: B



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6. In desert plant *Opuntia* photosynthetic function is taken over by

A. Leaves

B. Roots

C. Stems

D. Flowers

Answer: C



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7. Many desert plants overcome the water problem by

- A. Thick cuticle on leaf surfaces
- B. Stomata arranged in deep pits
- C. Special photosynthetic pathway CAM
- D. All

Answer: D



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8. In *Opuntia*, leaves are reduced to spines.

This is an adaptation to

A. minimise water loss through
transpiration

B. maximise water absorption from
atmosphere

C. maximise the rate of photosynthesis

D. minimise the rate of photosynthesis

Answer: A



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9. Which of the following is not an adaptation in desert plants to conserve water?

A. Presence of stomata in deep pits

B. CAM pathway to enable the stomata to remain closed during night time

C. Reduction of leaves into spines to minimise the loss of water through transpiration

D. Thick cuticle on the leaf surfaces

Answer: B



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10. The major source of water for kangaroo rat is

A. drinking of water

B. metabolic water produced by the
oxidation of fat

C. absorption of water through its skin

D. water present in the food it ingests

Answer: B



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11. Symptoms of altitude sickness include

A. Nausea

B. Fatigue

C. Heart palpitation

D. All the above

Answer: D



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12. The body compensates low oxygen availability at high altitude by

A. Increasing RBC production

B. Increasing the rate of breathing

C. Kidneys secrete a hormone
erythropoietin

D. All

Answer: D



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13. Which of the following does not help overcome altitude sickness?

A. Increased RBC production

B. Increased breathing rate

C. Pumping of more blood by the heart

D. Increased binding capacity of
haemoglobin

Answer: D



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Exercise I Populations

1. Population ecology is an important area because it links ecology to

A. physiology and population genetics

B. embryology and evolution

C. population genetics and evolution

D. biodiversity and its conservation

Answer: C



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2. If a population of 50 Paramecium present in a pool increase to 150 after an hour, what

would be the absolute growth rate of population?

- A. 50 per hour
- B. 200 per hour
- C. 5 per hour
- D. 100 per hour

Answer: D



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3. What would be the per cent growth or birth rate per individual per hour for the same population mentioned in the previous question?

A. 100

B. 200

C. 50

D. 150

Answer: B



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4. A population has more young individuals compared to the older individuals. What would be the status of the population after some years?

- A. It will decline
- B. It will stabilise
- C. It will increase
- D. It will first decline and then stabilise

Answer: C



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5. What parameters are used for tiger census in our country's national parks and sanctuaries?

- A. Pug marks only
- B. ug marks and faecal pellets
- C. Faecal pellets only
- D. Actual head counts

Answer: B



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6. Which of the following would necessarily decrease the density of population in a given habitat?

- A. Natality \geq mortality
- B. Immigration \geq emigration
- C. Mortality and emigration
- D. Natality and immigrat

Answer: C



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7. A protozoan reproduces by binary fission .
What will be the number of protozoans in its
population after six generations ?

A. 128

B. 24

C. 64

D. 32

Answer: C



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8. In 2005, for each of the 14 million people present in a country 0.028 were born and 0.008 died during the year. Using exponential equation, the number of people present in 2015 can be predicted as

A. 25 millions

B. 17 millions

C. 20millions

D. 18 millions

Answer: B



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9. Which one of the following organisms reproduces sexually only once in its life time?

A. Bamboo plant

B. Mango

C. Tomato

D. Eucalyptus

Answer: A



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10. The number of new individuals produced in a unit time, per unit population is described as

A. Mortality

B. Natality

C. Immigration

D. Emigration

Answer: B



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11. In a pond there were 400 frogs last year and through reproduction 200 frogs are added taking current population to 600. The birth rate is

A. 0.4

B. 0.5

C. 0.6

D. 0.7

Answer: B



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12. The status of a population, whether it is growing, stable, or declining is indicated by

- A. Energy pyramid
- B. Biomass pyramid
- C. Age pyramid
- D. Number pyramid

Answer: C



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13. Organisms represented at the top of an age pyramid are

A. Pre-reproductive

B. Reproductive

C. t-reproductive

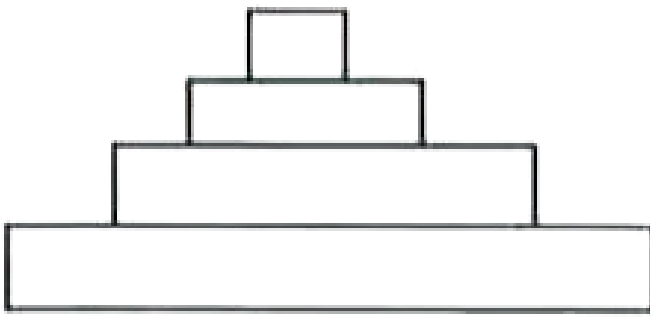
D. Producers

Answer: C



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14. In an age pyramid, which age group is represented at the bottom ?



- A. Pre- reproducing age
- B. Post reproducing age
- C. Reproducing age
- D. None of these

Answer: A



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15. In a growing population, which age group includes a large number of individuals?

A. Pre - reproductive

B. Post - reproductive

C. Reproductive

D. All the three groups are in equal numbers

Answer: A



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16. Total number of individuals per unit area of unit volume is called

- A. Biotic potential
- B. Population density
- C. Life expectancy
- D. Carrying capacity

Answer: B



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17. In a population of 2,500 whose intrinsic rate of natural increase (r) is 0.2 per capita per year is exhibiting exponential growth. If the number of individuals at a given moment is 2,000 what will the population size after one year?

A. 2500

B. 2300

C. 2600

D. 2400

Answer: D



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18. Choose the incorrect statement.

A. The size of the population for any species is static parameter

B. Some of the factors that influences the size of populations are food, predation and environmental resistance

C. Age pyramid indicates whether a population is growing, stable or declining

D. Under normal condition births and deaths are most important factors influencing population density

Answer: A



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19. The size of a population increases if

A. Natality = Mortality

B. Natality < Mortality

C. Natality > Mortality

D. Mortality > Natality

Answer: C



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20. Which of the following factor has a negative effect on the population growth rate?

A. Emigration

B. Birth rate

C. Immigration

D. Natality

Answer: A



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21. In a population of a habitat in one year 200 births, 150 deaths, 200 emigrations and 150 immigrations have occurred. The density of population

- A. Increased
- B. Decreased
- C. Remains unchanged
- D. Cannot be predicted

Answer: C



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22. Exponential growth is observed in a population when

- A. Resources in the habitat are unlimited
- B. Each species has the ability to realize its full innate potentials
- C. both 1 and 2
- D. none of these

Answer: C



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23. In population, per capita birth rate is 0.15 and per capita death rate is 0.08 during unit time period. What is the value of 'r'?

A. 0.25

B. 0.07

C. 0.05

D. 0.25

Answer: B



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24. The maximum possible number of individuals that a habitat can support is called its

- A. Birth rate
- B. Surviving ability
- C. carrying capacity
- D. biotic potential

Answer: C



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25. The phase of the population growth where natality is equal to mortality is called

- A. Asymptote
- B. lag phase
- C. Log phase
- D. none of these

Answer: A



26. In logistic growth curve, the initial stage of the curve is called

- A. Log phase
- B. lag phase
- C. Stability phase
- D. Asymptote phase

Answer: B



27. In the equation *[Math Processing Error]* is

- A. Population density after the time 'f'
- B. Population density at the time zero
- C. Intrinsic rate of natural increase
- D. The base of natural logarithm

Answer: D



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28. Which of the following is an incomplete count to estimate population density?

- A. Number of Parthenium plants in an area
- B. Number of fish caught per trap
- C. Biomass of bacteria in culture plate
- D. Number of birds in a sanctuary

Answer: B



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29. A population has more young individuals compared to the older individuals. What would be the status of the population after some years?

A. 0.9, 0.14

B. 0.09, 0.14

C. 0.14, 0.09

D. 0.54, 0.84

Answer: B



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30. Rather than the number of individuals, the per cent cover or biomass is a more meaningful measure of the population density in cases where

A. counting the number of individuals is impossible

B. counting the number of individuals is very time consuming

C. number of individuals is a meaningless measure to compare two different populations

D. all the above

Answer: D



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31. Percentage of individuals of a given age group in a given population is called as

A. age distribution

B. age density

C. age graph

D. age curve

Answer: A



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32. Population density is the

A. Number of species in an ecosystem

B. Number of individuals of a species per unit area

C. Number of births reported in a year

D. Number of individuals of a species in an ecosystem

Answer: B



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33. An age pyramid illustrates

- A. Different trophic levels in a community
- B. Population density
- C. Percentage of persons in successive age categories in a given population
- D. Population natality rate

Answer: B



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34. Read the following statements and select the correct option:

(a) Age pyramids reflect the status of a population - whether it is growing, stable or declining.

(b) Different age groups have different reproductive capabilities.

A. (b) is correct but (a) is false.

B. Both (a) and (b) are true.

C. (a) is correct but (b) is false.

D. Both (a) and (b) are false.

Answer: C



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35. Identify the status of the populations X, Y and Z whose age pyramids are-given below?



X



Y



Z

- | | | | |
|----|-----------|-----------|-----------|
| 1) | stable | growing | declining |
| 2) | growing | stable | declining |
| 3) | growing | declining | stable |
| 4) | declining | stable | growing |



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36. Study the following flow chart and identify the attributes X and Y.

	X	Y
1)	Natality	Mortality
2)	Immigration	Emigration
3)	Mortality	Natality
4)	Emigration	Mortality



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37. Which of the following factors would not limit the growth of a population?

A. Emigration

B. Immigration

C. Disease

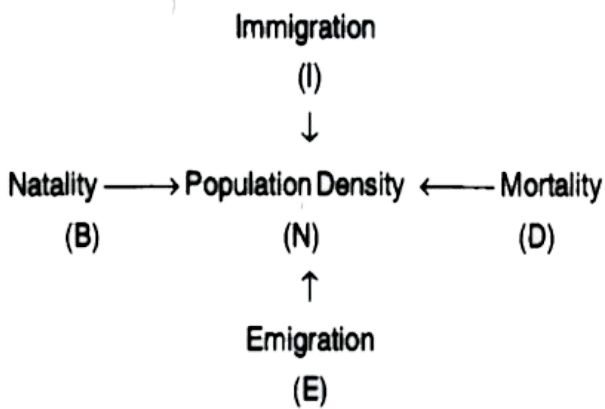
D. Mortality

Answer: C



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38. Study the following flow chart and choose the correct option.



A. 'B' and 'O' cause a positive change while

'I' and 'E' cause a negative change in 'N'

B. If a new habitat is just being colonised,

'B' may contribute more significantly to

'N' than 'I'

C. 'N' will increase only when (B+I) is

greater than (D+E)

D. 'B' and 'I' are most influential factors under normal conditions while 'D' and 'E' assume importance only under special conditions

Answer: B



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39. What does 'K' represent in the equation given below?

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

- A. Population density at time 't'
- B. Intrinsic rate of natural increase
- C. Carrying capacity
- D. The base of natural logarithm

Answer: C



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40. Which of the following statements is correct ?

A. Geometric growth produces J-shaped population growth curve

B. Logistic growth occurs when resources are limiting

C. Equation for exponential growth is

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

D. All of these

Answer: C



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41. What does 'e' represent in the integral form of exponential growth equation given below?

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

- A. Population density at time 't'
- B. Population density at time 0
- C. Intrinsic rate of natural increase

D. The base of natural logarithm

Answer: D



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42. In a population, per capita birth rate is 0.05 and per capita death rate is 0.03 during a unit time period. What is the value of intrinsic rate of natural increase ('r') for the given population?

A. 0.08

B. 0.02

C. 0.05

D. 0.20

Answer: D



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43. Which of the following is not true about exponential growth in a population?

A. It occurs when resources in the habitat are unlimited

B. A population growing exponentially under unlimited resource conditions can reach enormous population densities in a short time.

C. The regulation of population growth is mainly by density dependent factors

D. When the population size, N , is plotted over time, a J-shaped growth curve is

produced.

Answer: B



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44. Which of the following equations correctly represents Verhulst-Pearl logistic growth?

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

B. $d \frac{N}{dt} = rN \left(1 - \frac{N}{K} \right)$

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

D. $d\frac{N}{dt} = rN$

Answer: C



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45. The integral form of exponential growth equation is

A. $N_0 = N_t e^n$

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

C. $N_t = N_0 e^n$

D. $N_t = N_0 + e^n$

Answer: B



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46. Match the terms column-I with column-II
and select the correct option

Column-I**Column-II**

A) Capacitation

1) Discharge of blood and other material from the lining of the uterus.

B) Ovulation

2) The attachment of the fertilized egg to the endometrium of uterus.

C) Menstruation

3) The first occurrence of menstruation

D) Menarche

4) The change undergone by sperm in the female reproductive tract

E) Implantation

5) Release of the ripe egg (ovum) from the ovary



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Exercise I Life History Variation

1. Organisms that breed once in their life time are

A. Birds

B. Mammals

C. Pacific Salmon fish

D. 1 and 2

Answer: C



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2. Organisms that breed many times during life time and produce small number of large sized offspring are.

A. Pacific salmon fish

B. Mammals

C. Oysters

D. Pelagic fishes

Answer: B



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3. Organisms that produce large number of small sized offspring are

A. Birds

B. mammals

C. Oysters

D. 1 and 2

Answer: C



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Exercise I Population Interactions

1. Amensalism is an association between two species where

A. one species is harmed and other is benefitted

B. one species is harmed and other is unaffected

C. one species is benefitted and other is unaffected

D. both the species are harmed

Answer: B



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2. Lichens are the associations of

- A. bacteria and fungus
- B. algae and bacterium
- C. fungus and algae
- D. fungus and virus

Answer: C



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3. Which of the following is a partial root parasite?

A. Sandal wood

B. Mistletoe

C. Orobanch

D. Ganoderma

Answer: A



4. The interaction where one species is benefitted and the other is neither benefitted nor harmed is

- A. Parasitism
- B. Amensalism
- C. Commensalism
- D. Competition

Answer: C



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5. The interaction in which both species are benefitted is termed.

A. Commensalism

B. Mutualism

C. Amensalism

D. Parasitism

Answer: B



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6. The interaction in which both species are harmed is

- A. Competition
- B. Commensalism
- C. Amensalism
- D. Mutualism

Answer: A



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7. The interaction where one species is harmed, and another is unaffected is

A. Commensalism

B. Amensalism

C. Mutualism

D. Parasitism

Answer: B



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8. The interaction where only one species is benefitted and detrimental to the other species is

A. Parasitism

B. Predation

C. Mutualism

D. 1 and 2

Answer: D



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9. Interacting species live closely together in

A. Commensalism

B. Predation

C. Parasitism

D. All

Answer: D



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10. In an field experiment, all the star fishes were removed from an enclosed intertidal area, more than 10 species of invertebrates became extinct within a year, because of

- A. Increased intra-specific competition
- B. Increased inter-specific competition
- C. Decreased inter-specific competition
- D. Decreased intra-specific competition

Answer: B



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11. Which of the following insect acquires distasteful chemical to its predator birds?

- A. Biston betularia
- B. Monarch butterfly
- C. Cactus-feeding moth
- D. Dragon fly

Answer: B



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12. Monarch butterfly acquires distasteful chemical during its

A. Adult stage feeding on nonpoisonous weed

B. Caterpillar stage feeding on poisonous weed

C. Pupa stage

D. Imago

Answer: B



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13. Calotropis is protected from the predators by producing

- A. Opium
- B. Cardiac glycosides
- C. Strychnine
- D. Nicotine

Answer: B



14. Substances produced by plants as defence against grazers and browsers include

- A. Caffeine
- B. Quinine
- C. Nicotine
- D. All of these

Answer: D



15. Fitness of one species is significantly lower in the presence of another species in case of

- A. Predation
- B. Parasitism
- C. Competition
- D. Mutualism

Answer: C



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16. In South American lakes visiting Flamingos and resident fishes compete for

A. Phytoplankton

B. Zooplankton

C. Diatoms

D. Aquatic plants

Answer: B



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17. The Abingdon tortoise in Galapagos islands became extinct after the goats were introduced on the land. This is example for

- A. Competitive release
- B. Competitive exclusion
- C. Interference competition
- D. Commensalism

Answer: B



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18. Connell's field experiment illustrates

- A. Competitive release
- B. Competitive exclusion
- C. Interference of competition
- D. Commensalism

Answer: A



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19. On the rocky sea coasts of Scotland larger and competitively superior barnacle is

A. Chthamalus

B. Balanus

C. Sacculina

D. Daphnia

Answer: B



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20. An orchid flower resembling the shape of a female fly so as to be able to get pollinated.

This is an example of

- A. Competitive release
- B. Competitive exclusion
- C. Interference competition
- D. None

Answer: A



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21. Gause's Principle explains

- A. Competitive release
- B. Competitive exclusion
- C. Interference of competition
- D. Commensalism

Answer: B



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22. Competitively inferior one will be eliminated when the resources are limited, according to the principle of

- A. Competitive release
- B. Competitive exclusion
- C. interference competition
- D. Amensalism

Answer: B



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23. Closely related species of warblers avoid competition due to behavioural differences in their foraging activities. This is an example of

- A. Competitive release
- B. Competitive exclusion
- C. Coexistence
- D. Commensalism

Answer: C



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24. Which of the following is not a parasitic adaptation?

- A. Presence of adhesive organs
- B. Presence of high reproductive capacity
- C. Presence of well-developed sense organs
- D. Life cycle includes one or two intermediate hosts or vectors

Answer: C



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25. Intermediate host of human liver fluke is

A. Fish

B. Snail

C. Goat

D. A fish and a snail

Answer: D



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26. Parasitic plant among the following is

A. *Scripus*

B. *Sagittaria*

C. *Trapa*

D. *Cuscuta*

Answer: D



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27. Cuckoo lays eggs in the nest of crow during breeding season. This is an example for

- A. Ectoparasitism
- B. Endoparasitism
- C. Brood parasitism
- D. Mutualism

Answer: C



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28. Barnacles growing on the back of the whale exemplify

A. Parasitism

B. Mutualism

C. Commensalism

D. Amensalism

Answer: C



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29. Which of the following is an example for commensalism?

A. Cattle egret and grazing cattle

B. Sea anemone and clown fish

C. Barnacles and whales

D. All

Answer: D



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30. An example for commensalism among the following is

- A. Liver fluke - Man
- B. Abingdon tortoise - Goat
- C. Orchid - Mango tree
- D. Cuckoo - crow

Answer: C



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31. Lichens represent mutualism between

- A. Fungus and higher plants
- B. Fungus and cyanobacteria
- C. Sea anemone and clown fish
- D. Barnacle and whale

Answer: B



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32. Identify correct statements.

A. The wasp pollinates the flowers of fig plant for suitable egg laying sites

B. Fig offers the whole fruit to the wasp as food for the development of wasp's larve

C. Female wasp lays eggs within the seeds of fig

D. The interaction between fig tree species and wasp species is an example for

commensa- lism

Answer: A



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33. Which of the following is associated with the interaction between Mediterranean orchid *Ophrys* and bees?

A. Sexual deceit

B. Pseudocopulation

C. Co-evolution

D. All the above

Answer: D



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34. Male bee pseudocopulates with the flowers of Mediterranean orchid *Ophrys* because

A. The male bee is attracted for nectar in the flower

B. The male bee is attracted to the petal as it presumes it to be the female bee

C. The male is attracted for shelter

D. None

Answer: B



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35. Which of the following is an example of coevolution ?

A. If the female bee's colour patterns change during evolution, the flower of *Ophrys* evolves to maintain the resemblance of its petal to the female bee.

B. Evolution of eggs of cuckoo to resemble those of crow in size and colour

C. Evolution a mimic to resemble the colour patterns of the model

D. all of above

Answer: D



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36. The type of interaction between hermit crab and sea anemone is

A. Protocooperation

B. Parasitism

C. Commensalism

D. Amensalism

Answer: A



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37. The prickly pear cactus caused havoc by spreading rapidly into millions of hectares of rangeland of Australia in early 20th century because

A. Prickly pear cactus is a native of Australia

B. An exotic species of moth was introduced into Australia

C. There were no natural predators of the cactus in Australia.

D. It had a mutualistic relationship with moths

Answer: C



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38. Assigning a '+' sign for beneficial interaction, '-' sign for detrimental and '0' for

neutral interaction, outcomes of competition
can be represented as:

A. + +

B. - -

C. - 0

D. + -

Answer: B



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39. Which of the following is an example of mutualism?

- A. Sucker fish on the back of a whale
- B. Cattle egret foraging close to cattle
- C. Clown fish living among the tentacles of sea anemone
- D. Mycorrhizae living on the roots of higher plants

Answer: D



40. The evolution of the flowers of a plant and its pollinator species tightly linked with one another is termed

A. macroevolution

B. coevolution

C. retrogressive evolution

D. divergent evolution

Answer: B



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41. Which of the following statements incorrect?

A. The human liver fluke depends on two intermediate hosts (a snail and a fish) to complete its life cycle.

B. The malarial parasite needs a vector (mosquito) to spread to other host organisms

C. All the parasites cause disease in their hosts organism

D. The life cycles of endoparasites are more complex because of their extreme specialisation.

Answer: C



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42. Who studied the co-existence of five closely related species of warblers on the same tree?

A. Gause

B. Mac Arthur

C. Darwin

D. Connell

Answer: B



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43. Choose the correct combination.

<i>Interaction</i>	<i>Species A</i>	<i>Species B</i>
1) Mutualism	+	0
2) Amensalism	-	0
3) Competition	0	0
4) Commensalism	+	+



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44. A compound "X" has molecular formula C_5H_9Cl . It does not react with bromine in CCl_4 . On treatment with strong base it produces single compound "Y" (C_5H_8) and reacts with $Br_2(aq)$. Ozonolysis of "Y"

produces a compound $C_5H_8O_2$. The structure of X is

- A. reserpine which causes hypotension
- B. cardiac glycosides which are toxic
- C. morphine which is hypnotic and sedative
- D.

Answer: C



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45. Competitive exclusion principle was given by

A. Allen

B. Pearl-Verhulst

C. Gause

D. N. Borlaug

Answer: C



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46. Two species competing for the same resource can avoid competition by choosing different habits. This phenomenon is called

- A. Competitive exclusion
- B. Competitive fitness
- C. Survival of the fittest
- D. Resource partitioning

Answer: D



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47. Study the following table and choose the option that correctly identifies A, B, C and D. ,

<i>Interaction</i>	<i>Species X</i>	<i>Species Y</i>
'A'	+	+
Amensalism	-	'B'
Competition	'C'	-
'D'	-	-
A	B	C

- | | | | |
|--------------|---|---|-------------|
| 1) mutualism | 0 | - | competition |
| 2) mutualism | 0 | - | parasitism |
| 3) mutualism | + | - | competition |
| 4) mutualism | - | 0 | competition |



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Exercise II Ecology And Its Importance

1. Greek word "Oikos" means

A. Unfolding

B. House

C. House

D. House

Answer: B



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2. Ecology was defined as the study of the relationship of organisms with their environment by

A. Huxley

B. Odum

C. Ernst Haeckel

D. Lamarck

Answer: C



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3. Ecology of a single species/population in relation to its environment is termed

A. Synecology

B. Autecology

C. Community ecology

D. Biosphere

Answer: B



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4. Community ecology deals with

- A. The study of changes in population size
- B. The study of changes in population size
- C. The interrelationships between the organisms of different species
- D. Ecological Niche

Answer: C



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5. An association of the interacting members of populations of different species in a particular area is called

A. Community

B. Population

C. Biome

D. Ecosystem

Answer: A



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6. The functional unit of the biosphere is

- A. Ecosystem
- B. Community
- C. Landscape
- D. Biome

Answer: A



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7. A large community of plants and animals that occupies a vast region is called

A. Biosphere

B. Biome

C. Landscape

D. Ecosystem

Answer: B



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8. The functional role of an organism in an ecosystem which is comparable to the profession of a person is called

A. Habitat

B. Niche

C. Ecosystem

D. Biome

Answer: B



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9. The branch of biology that deals with the study of interactions between organisms and their environment is termed

A. evolution

B. ecology

C. ethology

D. etiology

Answer: B



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10. Identify 'X' in the flowchart given below.



A. Ecosystem

B. Population

C. Biosphere

D. Organs

Answer: B



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11. A group of interacting species living in a particular ecosystem constitute a

A. biosphere

B. population

C. biome

D. community

Answer: D



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12. Study of organisms of a single species in relation to their environment is termed

A. synecology

B. community ecology

C. autecology

D. ethology

Answer: C



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13. Read the following statements and select the correct options

(a) Study of a single individual or a population in relation to environmental is called synecology.

(b) Study of a community in relation to environmental is known as autecology

A. (b) is correct but (a) is false.

B. Both (a) and (b) are true.

C. (a) is correct but (b) is false.

D. Both (a) and (b) are false

Answer: D



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Exercise II Organism And Environment Introduction

1. Ecology at the level is essentially physiological ecology which tries to understand how different organisms are adapted to their environments.

A. population

B. community

C. ecosystem

D. organism

Answer: D



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2. Which of the following is an aquatic biome?

A. Tundra

B. Chaparral

C. Savannah

D. Coral reef

Answer: D



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3. Tundras, grasslands and deserts are examples of different

A. biospheres

B. biomes

C. ecosystems

D. populations

Answer: B



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4. The habitat of an organism is characterised by

A. Physical components of abiotic factors

B. Chemical components of abiotic factors

C. Other organisms

D. All the above

Answer: D



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5. Tropical forest biomes are characterised by

A. Low temperature and low precipitation

B. Low temperature and high precipitation

C. High temperature and low precipitation

D. High temperature and high precipitation

Answer: D



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6. Desert biomes are characterised by

A. Low temperature and low precipitation

B. Low temperature and high precipitation

C. High temperature and low precipitation

D. High temperature and high precipitation

Answer: C



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7. Which of the following biomes has low temperature and low precipitation?

A. Tundra

B. Tropical forest

C. Temperate forest

D. Desert

Answer: A



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8. Terrestrial biomes are characterized by

A. Specific climate

B. Dominant vegetation

C. Microorganisms

D. 1 and 2

Answer: D



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Exercise II Temperature

1. Difference between the maximum temperature and the minimum temperature in a day is highest in a

A. Desert

B. Grassland

C. Sea

D. Forest

Answer: A



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2. Match Column-I with Column-II and select the correct option from the codes given below

Column-I		Column-II	
(a)	Eurythermal	(i)	Salmon
(b)	Stenothermal	(ii)	Red algae
(c)	Euryhaline	(iii)	Shark
(d)	Stenohaline	(iv)	Corals

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



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3. Temperature affects

A. metabolic rate

B. morphology

C. geographical distribution

D. all the above

Answer: D



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4. Which of the following options is correct?

- | | | |
|----|--------------|-------------|
| A. | Stenothermal | Eurythermal |
| | Homo sapiens | Eurthermal |
| B. | Stenothermal | Eurythermal |
| | Macropus | Rana |
| C. | Stenothermal | Eurythermal |
| | Homo | Pinus |

- | | | |
|----|--------------|-------------|
| | Stenothermal | Eurythermal |
| D. | Homo | Pinus |

Answer: D



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5. Mangoes do not and cannot grow in temperature regions. The most important environmental factor responsible for it is

A. soil

B. temperature

C. water

D. light

Answer: B



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6. Match Column-I with Column-II and select the correct option from the codes given below.

Column-I		Column-II	
(a)	Endotherms	(i)	Red algae
(b)	Ectotherms	(ii)	Conifers
(c)	Eurytherms	(iii)	Lizards
(d)	Stenotherms	(iv)	Humans

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



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7. Organisms that can maintain a constant internal temperature are called

A. homeotherms

B. poikilotherms

C. eurytherms

D. stenotherms

Answer: A



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Exercise II Response To Abiotic Factors

1. Which of the following options is a correct matching of category and examples?

- | | | |
|----|--------------|----------------------|
| | Category | Examples |
| A. | Eurtherms | Platypus, Salamander |
| | Category | Examples |
| B. | Poikilotherm | Sea horse, Sea cow |
| | Category | Examples |
| C. | Homeotherms | Pigeon, Kangaroo |
| | Category | Examples |
| D. | Stenotherm | Pinus Gelidium |

Answer: C



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2. Which of the following is an incorrect match?

A. Diapause - Suspend

B. Siberian - Migrate

C. Hibernation-Escape in space

D. Mammals - Regulate

Answer: C



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3. The body temperature of an animal at 20° DC is same as its temperature at 30° DC. It can be included under the category

A. conformers

B. regulators

C. poikilotherms

D. euryhaline

Answer: B



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4. Freshwater animals are not osmoconformers because

A. they require large quantities of water to excrete ammonia

B. they are subjected to exosmosis due to which their body fluids become more concentrated

C. their body fluids would be too dilute to carry out life's processes

D. salts move passively from the surrounding medium into their bodies

Answer: C



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5. In animals, migration serves for

A. avoiding stressful seasons like winter

B. moving to new areas with food when
their number increases beyond the
feeding capacity of the homeland

C. moving from a hostile area to a more
hospitable area

D. All of these

Answer: D



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Exercise II Water

1. Which of the following statements is incorrect?

A. Life on earth originated in water

B. The productivity and distribution of plants is dependent on water

C. Only limited amount of water is available
in deserts

D. Aquatic organisms do not face any
water- related problems

Answer: D



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2. Which of the following are found in the
surface waters of the sea?

A. Red algae

B. Benthic forms

C. Green algae

D. Brown algae

Answer: C



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Exercise II Light

1. Which of the following is an example of circadian rhythm

- A. migration in birds
- B. flowering in summer
- C. hibernation
- D. sleep-wake cycle

Answer: D



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2. Read the following statements and select the correct option:

(a) Not all the colour components of the visible spectrum are available for marine plants living at different depths of the ocean.

(b) Red light can reach the deepest. Blue light has poor penetrability.

A. (b) is correct but (a) is false.

B. Both (a) and (b) are true.

C. (a) is correct but (b) is false.

D. Both (a) and (b) are false.

Answer: C



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3. Echolocation is exhibited by

A. Bats

B. Rats

C. Cats

D. Owls

Answer: A



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4. Cave dwelling animals show

A. Bioluminescence and high metabolic rate

B. More pigmentation & high metabolic rate

C. No pigmentation & no metabolic rate

D. Less pigmentation & less metabolic rate

Answer: D



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5. Biological rhythms that are repeated once every 24 hours are

A. Circannual rhythms

B. Circadian rhythms

C. Lunar periodicity

D. 1 and 2

Answer: B



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6. Which abiotic factor has role in setting or resetting the biological clocks?

A. Light

B. Pressure

C. Gravity

D. Soil

Answer: A



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7. Breeding in a particular season every year is an example of

- A. Circannual rhythms
- B. Circadian rhythms
- C. Lunar periodicity
- D. 2 and 3

Answer: A



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8. Producers occurring deep in the oceans are

- A. Chemoautotrophs
- B. Chemoheterotrophs
- C. Photoautotrophs
- D. Photoheterotrophs

Answer: A



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9. Which of the following is incorrect regarding ultraviolet rays?

- A. Cause death of micro organisms
- B. Prolonged exposure cause skin cancer
- C. They are the rays of visible spectrum
- D. Help to convert sterols into vitamin D

Answer: C



Exercise II Adaptations

1. Cell membranes of archaebacteria can withstand higher temperatures because their membrane lipids have

- A. ester bonds
- B. hydrogen bonds
- C. ether bonds
- D. low molecular weight

Answer: C



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2. A rhino covering itself in mud to keep its body cool is an example of

A. morphological adaptation

B. physiological adaptation

C. behavioural adaptation

D. anatomical adaptation

Answer: C



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3. Compared to those living in tropical region, mammals living in the colder regions are characterised by

A. thin layer of body fat below their skin

B. aestivation during summer months

C. large-sized ear lobes to minimise the heat loss

D. less body surface per unit volume of the
body

Answer: D



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Exercise II Water Related Adaptions

1. Migratory fishes are

A. stenohaline

B. eurythermal

C. euryhaline

D. homeothermic

Answer: C



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2. Freshwater organisms live in (a) medium and hence are subjected to (b).

(a)

- 1) Hypertonic
- 2) Hypertonic
- 3) Hypotonic
- 4) Hypotonic

(b)

- Exosmosis
- Endosmosis
- Exosmosis
- Endosmosis



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Exercise II Populations

1. If a new habitat is just being colonised, contribution of which of the following is more significant in the increase in population density?

A. Natality

B. Immigration

C. Emigration

D. Mortality

Answer: B



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2. Counting all the fresh piles of faecal pellets of deer in a given area is an example of

A. Direct counting

B. Incomplete counting

C. Indirect counting

D. Mark and recapture method

Answer: C



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3. Mark the incorrect statement

A. Natality contributes to an increase in population density

B. Mortality contributes to a decrease in population density

C. Population density is influenced by immigration and emigration rates

D. Mortality is high when the population size is small

Answer: D



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4. All of these have a positive influence on the growth of the population except

A. Natality

B. Fecundity

C. Emigration

D. Immigration

Answer: C



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5. Read the following statements and select the correct option:

(a) A population in which most individuals are in pre-reproductive age group is likely to grow rapidly in future.

(b) Many individuals in that population will begin to reproduce soon.

A. (b) is correct but (a) is false

B. Both (a) and (b) are true

C. (a) is correct but (b) is false

D. Both (a) and (b) are false

Answer: B



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6. A population with a larger proportion of post-reproductive individuals is likely to

A. grow at a faster rate

B. remain stable for a long time

C. decline in course of time

D. have more natality than mortality

Answer: C



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7. Age pyramid of a stable population is

A. urn-shaped

B. triangular

C. bell-shaped

D. inverted

Answer: C



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8. Ratio of the body surface to the body size is less in

A. Warm blooded animals living in colder regions

B. Warm blooded animals living in warmer regions

C. Cold blooded animals living in colder regions

D. All vertebrates living in warmer regions

Answer: A



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9. Major problems faced by freshwater animals is

A. Gain of salts and loss of water

B. Loss of salts and gain of water

C. Gain of salts and water

D. Loss of salts and water

Answer: B



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10. Catadromous migration is exhibited by

A. Protopterus

B. Anguilla

C. Hilsa

D. Moloch

Answer: B



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11. Migratory fishes are

A. Euryhaline with aglomerular kidneys

B. Stenohaline with aglomerular kidneys

C. Stenohaline with glomerular kidneys

D. Euryhaline with glomerular kidneys

Answer: D



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12. The births and deaths of four populations A, B, C and D in a year are given below. Which population has the highest growth rate?

	<i>Population</i>	<i>Number</i>	<i>Births</i>	<i>Death</i>
1)	A	60	12	6
2)	B	180	54	45
3)	C	38	6	3
4)	D	1200	60	12



13. Which of the following statements is correct?

A. The number of organisms can increase but never decreases once a population reaches its carrying capacity

B. All populations experience exponential growth once they reach carrying capacity

C. A population always grows rapidly once it reaches its carrying capacity

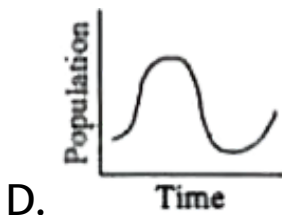
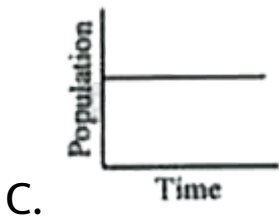
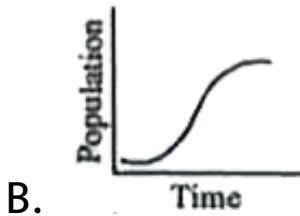
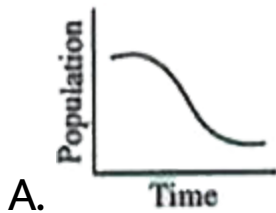
D. Limiting factors can influence the number of organisms in a population once it reaches its carrying capacity

Answer: D



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14. Which of the following represents logistic growth curve?



Answer: B



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15. The maximum population size of the species that the environment can sustain indefinitely is termed

- A. fecundity
- B. immigration
- C. carrying capacity
- D. biotic potential

Answer: C



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Exercise II Population Interactions

1. If an organism's body pattern resembles its environment making it difficult to spot, it is called as

A. camouflage

B. mimicry

C. cyclomorphosis

D. diapause

Answer: A



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Exercise Iii Previous Aipmt Neet Questions

1. Asymptote in a logistic growth curve is obtained when

A. $K=N$

B. $K > N$

C. $K < N$

D. The value of 'r' approaches zero

Answer: A



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2. Mycorrhizae are the example of

A. Amensalism

B. Antibiosis

C. Mutualism

D. Fungistasis

Answer: C



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3. 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?

A. 1218

B. 739

C. 2012

D. 448

Answer: C



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4. Which scientist proposed 'Rivet popper hypothesis' related to biodiversity and Ecosystems?

A. Alexander von Humboldt

B. Paul Ehrlich

C. David Tilman

D. Tansley

Answer: B



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5. Assigning a '+' sign for beneficial interaction, '-' sign for detrimental and '0' for neutral

interaction, outcomes of competition can be represented as:

A. Commensalism

B. Parasitism

C. Mutualism

D. Amensalism

Answer: B



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6. The principle of competitive exclusion was stated by

A. Mac Arthur

B. Verhulst and Pearl

C. C. Darwin

D. G. F. Gause

Answer: D



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7. Gause's principle of competitive exclusion states that

A. More abundant species will exclude the less abundant species through competition

B. Competition for the same resources excludes species having different food preferences

C. No two species can occupy the same niche indefinitely for the same limiting

resources

D. Larger organisms exclude smaller ones
through competition

Answer: B



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8. When does the growth rate of a population following the logistic model equal zero? The logistic model is given as $\frac{dN}{dt} = rN(1-N/K)$

A. When N/K is exactly one

B. When N nears the carrying capacity
of the habitat

C. When N/K equals zero

D. When death rate is greater than birth
rate

Answer: A



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9. In which of the following interactions both partners are adversely affected ?

A. Mutualism

B. Competition

C. Predation

D. Parasitism

Answer: B



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10. An association of individuals of different species living in the same habitat and having functional interaction is

A. ecosystem

B. population

C. ecological niche

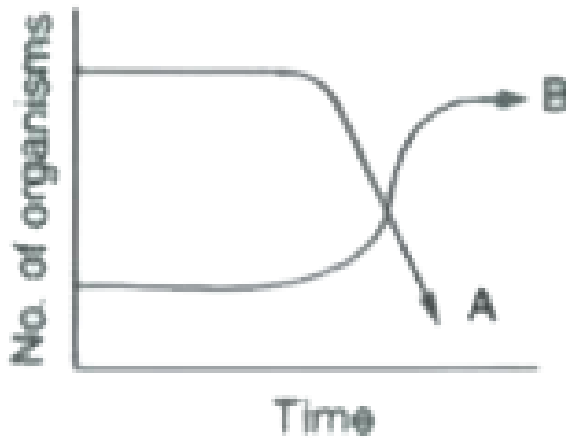
D. biotic community

Answer: D



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11. 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



A. Population A produced more offspring than population B

B. Population A consumed the members of
population B

C. Both plant populations in this habitat
decreases

D. Population B competed more
successfully for food than population A

Answer: D



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12. Just as a person moving from Delhi to Shimla to escape the heat for the duration of hot summer, thousands of migratory birds from Siberia and other extremely cold northern regions move to:

A. Western Ghats

B. Meghalaya

C. Corbett National Park

D. Keoladeo National Park

Answer: D



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13. Besides paddy fields, cyanobacteria are also found inside vegetative part of:

A. Equisetum

B. Psilotum

C. Pinus

D. Cycas

Answer: B



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

- A. Ectoparasitism
- B. Symbiosis
- C. Commensalism
- D. Amensalism

Answer: B





15. A biologist studies 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. 10

B. 15

C. 5

D. zero

Answer: D



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16. The age pyramid with broad base indicates

- A. high percentage of old individuals
- B. low percentage of young individuals
- C. a stable population
- D. high percentage of young individuals

Answer: D



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17. Which of the following is not a parasitic adaptation?

- A. Development of adhesive organs
- B. Loss of digestive organs
- C. Loss of reproductive capacity
- D. Loss of unnecessary sense organs

Answer: C



18. Benthic organisms are affected the most by

A. light reacting the forest floor

B. surface turbulence of water

C. sediment characteristics of aquatic ecosystems

D. water-holding capacity of soil

Answer: C



19. Cuscuta is an example of

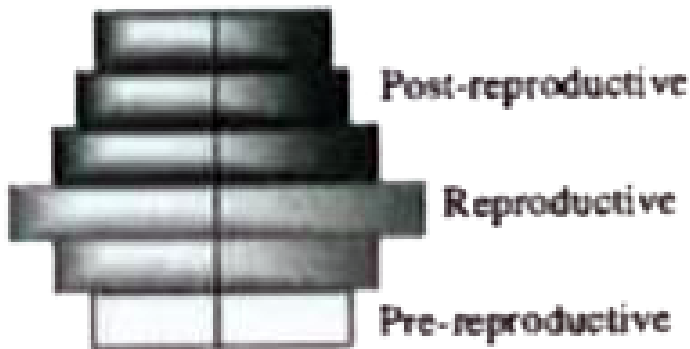
- A. ectoparasitism
- B. brood parasitism
- C. predation
- D. endoparasitism

Answer: A



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



- A. Expanding population
- B. Vanishing population
- C. Stable population
- D. Declining population

Answer: D



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21. Large woody vines are more commonly found in :

- A. Alpine forests
- B. Temperate forests
- C. Mangroves
- D. Tropical rainforests

Answer: D



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22. Consider the following four conditions (a-d) and select the correct pair of them as adaptations to environment in desert lizards

The conditions :

a) burrowing in soil to escape high temperature

b) losing heat rapidly from the body during high temperature

c) bask in sun when temperature is low

d) insulating body due to thick fatty dermis

A. (a),(b)

B. (c),(d)

C. (a),(c)

D. (b),(d)

Answer: C



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23. Which one of the following is categorised as a parasite in true sense?

A. the female anopheles bites and sucks blood from humans

B. human foetus developing inside the uterus draws nourishment from the mother

C. head louse living on the human scalp as well as laying eggs on human hair

D. the cuckoo (koel) lays its eggs in crow's nest

Answer: C



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24. The logistic population growth is expressed by the equation

A. $dt / dN = Nr \left(\frac{K - N}{K} \right)$

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

C. $dN / dt = rN$

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

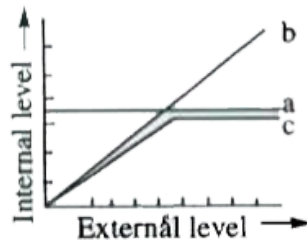
Answer: B



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25. The figure given below is a diagrammatic representation of response of organisms to abiotic factors. What do a, band c represent

respectively?



(a)

1) conformer

2) regulator

3) partial regulator

4) regulator

(b)

regulator

partial regulator

regulator

conformer

(c)

partial regulator

conformer

conformer

partial regulator



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26. Which one of the following is one of the characteristics of a biological community?

A. Stratification

B. Natality

C. Mortality

D. Sex-ratio

Answer: A



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

A. host is an organism which provides food to another organism

B. amensalism is a relationship in which one species is benefitted whereas the other is unaffected

C. predator is an organism that catches and kills

D. parasite is an organism which always lives inside the body of other organism and may kill it

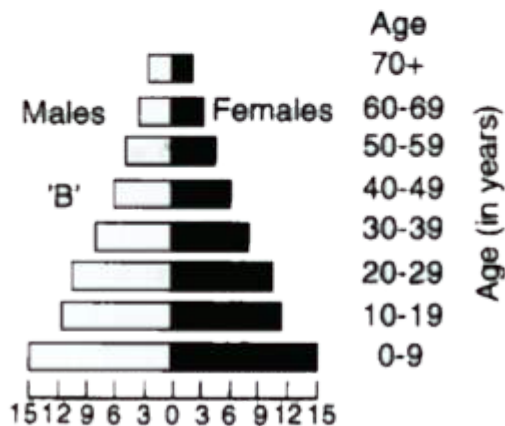
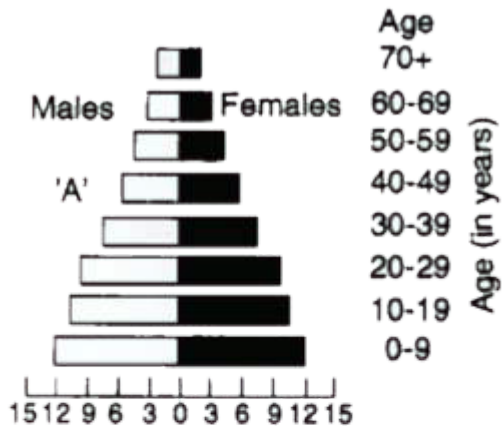
Answer: C



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28. A country with a high rate of population growth took measures to reduce it. The figures shows age-sex pyramids of populations A and B twenty years apart. Select the correct

interpretation about them:



A. "A" is the earlier pyramid and no change has occurred in the growth rate

B. "A" is more recent shows slight reduction
in the growth rate

C. B is earlier pyramid and shows stabilized
growth rate

D. B is more recent showing that
population is very young

Answer: B



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29. Reduction in vascular tissue, mechanical tissue and cuticle is characteristic of

A. mesophytes

B. epiphytes

C. hydrophytes

D. xerophytes

Answer: C



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30. Consider the following four statements (i)-(iv) about certain desert animals such as kangaroo rat.

i) They have dark colour and high rate of reproduction and excrete solid urine ii) They do not drink water, breathe at a slow rate to conserve water and have their body covered with thick hairs iii) They feed on dry seeds and do not required drinking water iv) They excrete very concentrated urine and do not use water to regulate body temperature. Out of these four, which two are correct :

A. c and a

B. c and a

C. c and d

D. b and c

Answer: C



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31. Quercus species are the dominant component in

A. scrub forests

B. tropical rain forests

C. temperate deciduous forests

D. alpine forests

Answer: C



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32. Geometric representation of age structure is a characteristic of :

A. Ecosystem

B. Biotic community

C. Population

D. Landscape

Answer: C



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33. 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?

A. The population of its predators increases enormously

B. S-shaped or sigmoid growth of this insect

C. The food plants mature and die at the end of the rainy season

D. Its population growth curve is of J-type

Answer: D



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34. If the mean and the median pertaining to a certain character of a population are of the same value, the following is most likely to occur

- A. a bi-modal distribution
- B. a T-shaped curve
- C. a skewed curve
- D. a normal distribution

Answer: D



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35. A high density of elephant population in an area can result in

- A. Predation on one another
- B. Mutualism
- C. Intraspecific competition
- D. Interspecific competition

Answer: C



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