



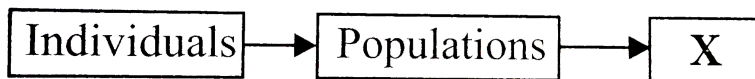
BIOLOGY

BOOKS - MTG BIOLOGY (ENGLISH)

ORGANISMS AND POPULATION

Mcqs

1. Refer to the given flow chart.



Identify X and select the correct option.

- A. Communities
- B. Biospheres
- C. Biomes

D. Species

Answer: A



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2. Basic unit of ecological hierarchy is

A. population

B. community

C. ecosystem

D. individual

Answer: D



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3. Several plant and animal species present together at a place constitute a

- A. genus
- B. population
- C. biome
- D. community

Answer: D



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4. The branch of science which studies the interactions among organisms and between organisms and physical environment is called as

- A. epidemiology
- B. ecology
- C. ethology

D. etiology

Answer: B



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5. Niche overlap indicates

- A. mutualism between two species
- B. active cooperation between two species
- C. two different parasites on the same host
- D. sharing of one or more resources between the two species

Answer: D



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

Statement 1 : Cow in india and Kangaroo in Australlia (both herbivores) are ecological equivalents.

Statement 2: The organisms having smaller niche in different geographical regions are known as ecological equivalents.

- A. Both Statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct
- D. Both statements 1 and 2 are incorrect

Answer: A



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

Statement 1 : Study of a single individual or a population in relation to environment is called autecology.

Statement 2 : Study of group of individuals or a community in relation to environment is known as synecology.

- A. Both statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct
- D. Both statements 1 and 2 are incorrect

Answer: A



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8. Seasonal variations on Earth occur due to its

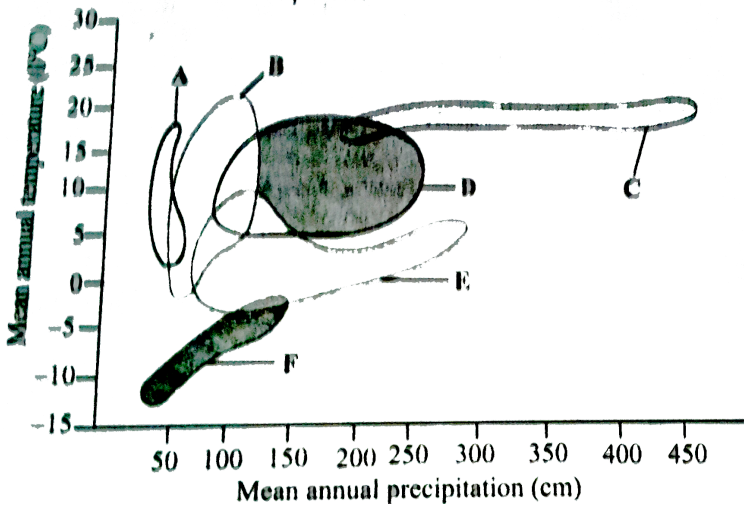
- A. tilted axis
- B. rotation around its own axis
- C. revolution around sun
- D. both (a) and (c)

Answer: D



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9. In the given figure identify the temperate forest and coniferous forest respectively from the markings $A - F$ and select the correct option.



A. A and B

B. B and D

C. D and E

D. C and F

Answer: C



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10. Different biomes are formed due to annual variations in _____ over the earth's surface.

A. temperature

B. precipitation

C. incident solar radiation

D. all of these

Answer: D



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11. Deserts, rain-forest, tundra etc, are examples of

- A. community
- B. biome
- C. ecosystem
- D. population

Answer: B



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12. Characteristics of a terrestrial biome are strongly influence by its

- A. flora
- B. climate
- C. fauna
- D. all of these

Answer: D



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13. _____ occurs in equatorial regions where rainfall and warmth are abundant, while _____ biomes lacks rain.

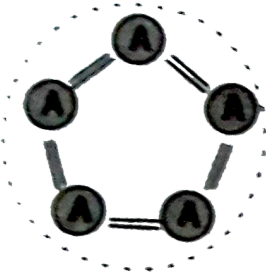
- A. Desert, temperate
- B. Tropical rain forest, desert
- C. Tundra, savannah
- D. Desert, chapparal

Answer: B

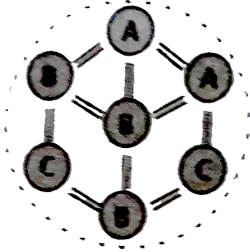


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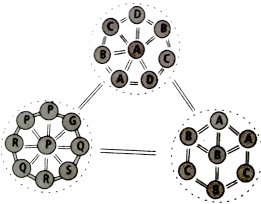
14. If A, B, C, D, G, P, Q, R and S represent different species then which of the following figures symbolizes a biome ?



A.



B.



C.

D. None of these

Answer: C



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15. The key elements that determine differences in environmental conditions of different habitats include

A. temperature

B. light

C. soil

D. all of these

Answer: D



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16. Which of the following is not a part of an organism's physical environment ?

A. Temperature

B. Light

C. Other organisms

D. Humidity

Answer: C

17. Which of the following statements is incorrect ?

- A. Average temperature decrease progressively from plains to the mountain tops.
- B. Average temperature decrease progressively from the equator towards the poles
- C. Temperature affects the kinetics of enzymes and through it the basal metabolism of organisms
- D. None of these

Answer: D

18. Mango trees do not and cannot grow in temperate regions. The most important environmental factor responsible for its is

- A. soil
- B. temperature
- C. water
- D. light

Answer: B



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19. Temperature is considered as the most ecologically relevant environmental factor because it affects or organisms.

- A. physiology
- B. morphology
- C. geographical distribution

D. all of these

Answer: D



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

- (i) Organisms capable to tolerate a wide range of temperature are called stenothermal organisms.
- (ii) Thermal tolerance of different species determine their geographical distribution to a large extent
- (iii) Average temperature in tropical deserts in summer is $< 50^{\circ}C$.
- (iv) Thermal springs cannot sustain life due to very high average temperature i.e., $> 100^{\circ}C$.

A. (i) only

B. (ii) only

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

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

Answer: B



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21. Which of the following options is correct ?

- | | | |
|----|-----------------------|----------------------|
| A. | Stenothermal organism | Eurythermal organism |
| | Frog | Lizard |
| B. | Stenothermal organism | Eurythermal organism |
| | Frog | Man |
| C. | Stenothermal organism | Eurythermal organism |
| | Man | Lizard |
| D. | Stenothermal organism | Eurythermal organism |
| | Polar bear | Coconut tree |

Answer: B



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22. Water is the second most important factor influencing life of organisms because

- A. it makes major part of an organism's body
- B. productivity of plants depend upon availability of water
- C. life on Earth originated in water
- D. both (a) and (b)

Answer: D



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23. Organisms that can tolerate a wide range of salt concentration are termed as

- A. stenosaline
- B. stenohaline
- C. euryhaline
- D. eurysaline

Answer: C



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24. A freshwater organism cannot survive in a water body that has greater ____ than its original habitat.

- A. oxygen content
- B. depth
- C. salt concentration
- D. water clarity

Answer: C



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25. Life is sustainable with water only because

- A. it makes 90 % of the protoplasm

- B. translocation of nutrients inside the body occurs with the help of water
- C. water loss in form of sweating helps to maintain body temperature
- D. all of these

Answer: D



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26. A place has very scanty rainfall, the dominant plants there may be

- A. Opuntia
- B. Nymphaea
- C. Asparagus
- D. both (a) and (c)

Answer: D



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27. Many freshwater organisms cannot live for long in seawater because the surrounding water will be _____ to body cells and _____ may occur.

- A. hypertonic, exosmosis
- B. hypertonic, endosmosis
- C. hypotonic, exosmosis
- D. hypotonic, ednosmosis

Answer: A



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28. Three water bodies were tested for salinity of water. Water body X showed salt concentration as 3 parts per thousand Y showed 35 parts per thousand and Z showed 110 parts per thousand salinity.

- A. X can be a lagoon

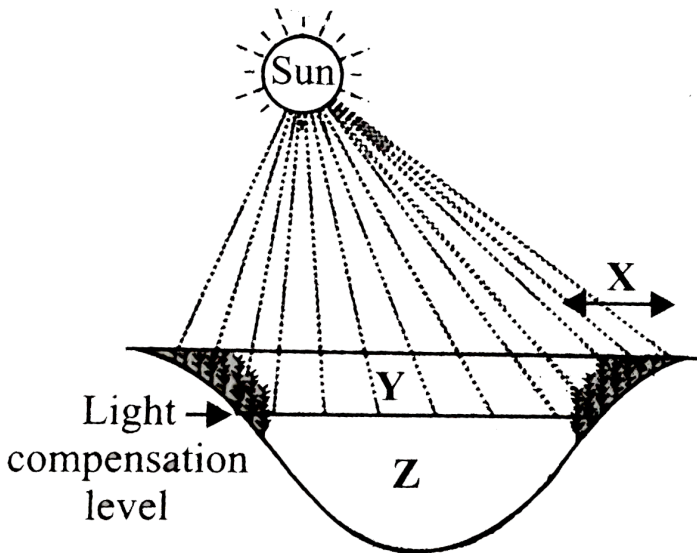
- B. Y can be a sea
- C. Z can be an inland river
- D. None of these

Answer: B



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29. Given figure represents the different zones of a lake or a pond.



Identify the labelled parts X , Y and Z and select the correct statement.

- A. X constitutes the shallow water banks and is called as littoral zone
- B. Y constitutes the open water zone upto which light can penetrate and is called as profundal zone.
- C. Z constitutes the deep water zone where light cannot penetrate and is called as limnetic zone.
- D. All of these

Answer: A



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30. Many animals use the diurnal and seasonal variations in light intensity and photoperiod to time their

- A. migration
- B. reproductive activities
- C. suspension

D. all of these

Answer: D



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31. Nature and properties of soil depends upon

A. climate

B. weathering process

C. development of soil

D. all of these

Answer: D



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32. 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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33. Which of the following statements is incorrect ?

- A. The flora of a place is heavily defined by availability and quality of water.
- B. The availability of light on land is closely linked with that of temperature since sun is the source for both
- C. Topography does not affect biodiversity
- D. Soil composition also affects the seepage of water into ground.

Answer: C



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

- (i) All the colour components of the visible spectrum are available for marine plants living in different depths of the ocean.
- (ii) Many herbs and shrubs in rainforests adapt to photosynthesise optimally under very low light conditions as they grow under canopy trees
- (iii) Gradual increase in average global temperature will affect the distributional range of some species.
- (iv) The quality of soil does not depend upon the weathering process.

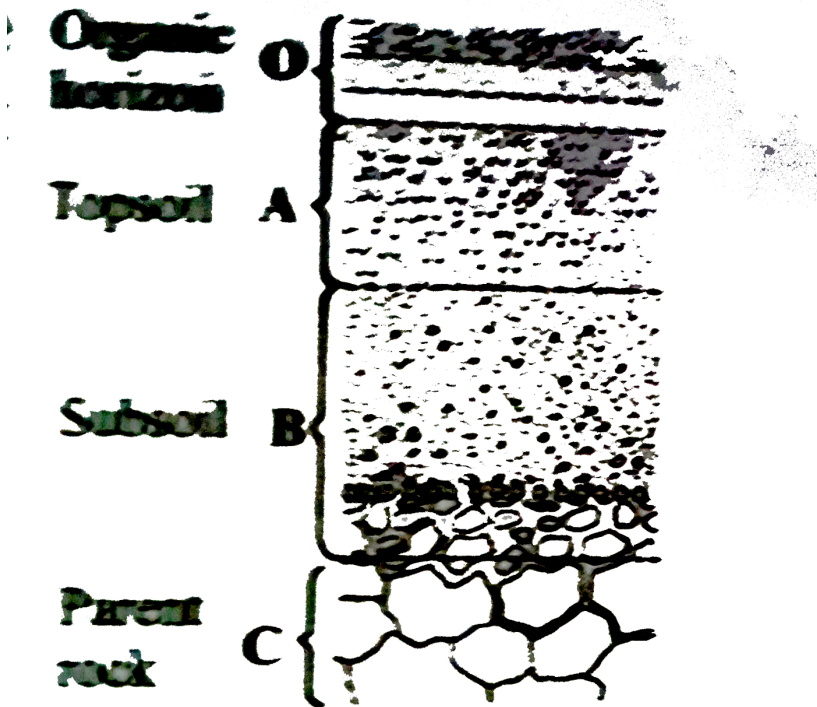
- A. (i) and (ii)
- B. (ii) and (iv)
- C. (ii) and (iii)
- D. (i) and (iv)

Answer: C



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35. Given figure represents the soil profile, showing different layers/horizons of soil. Which of the following statements regarding the soil profile are not true ?



- (i) Maximum roots of plants are found in horizon A.
- (ii) Maximum nutrients are present in horizon B.

(iii) Horizon B contains partly weathered rocks.

(iv) Horizon C contains roots of the plants and mineral salts.

A. (i) and (ii)

B. (i) and (iii)

C. (ii) and (iv)

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

Answer: C



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36. An animal that can survive at $10^{\circ}C$ and $40^{\circ}C$ both, can be placed under the category of

A. conformers

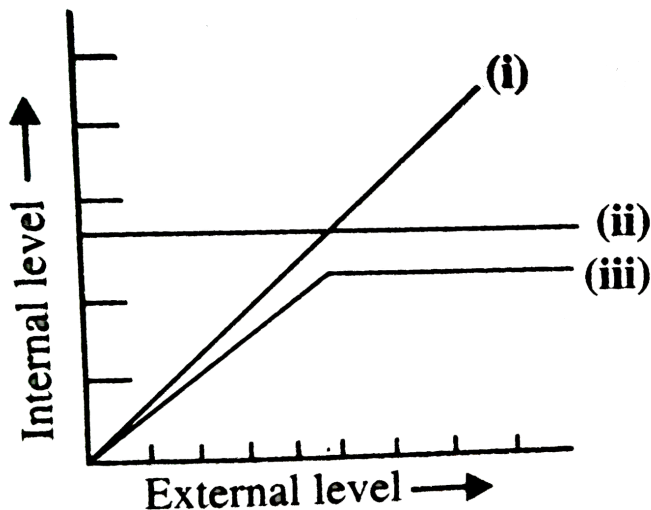
B. regulators

C. migratory organisms

Answer: B

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37. Given graph represents the response of organisms to various abiotic factors. On this basis, select the correct option for (i), (ii) and (iii)



- A. (i) (ii) (iii).
 Conformers Regulators Partial regulators
- B. (i) (ii) (iii).
 Regulators Partial regulators Conformers
- C. (i) (ii) (iii).
 Partial regulators Regulators Conformers

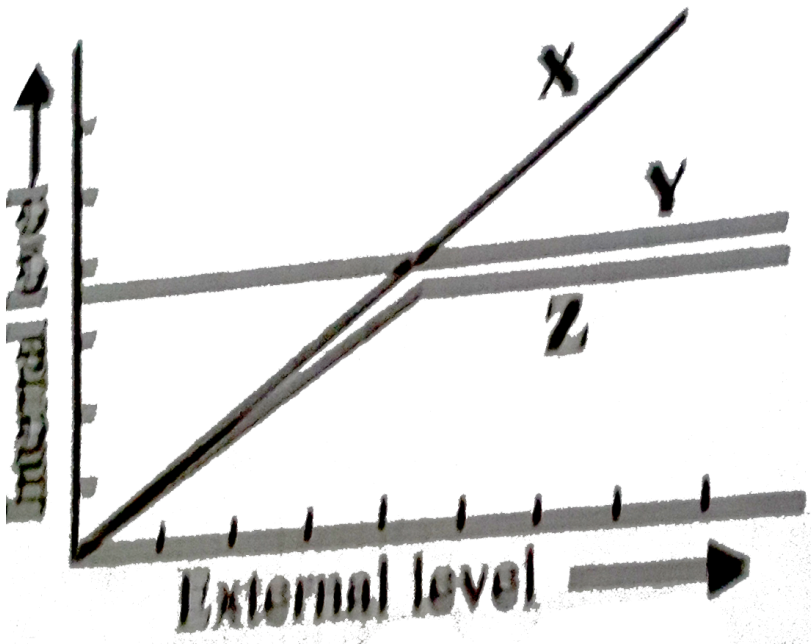
- D. (i) (ii) (iii).
Regulators Conformers Partial regulators

Answer: A



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



A. X could be a mammal

B. Y could be a bird

C. Z could be a mammal

D. X could be a bird

Answer: B



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39. Organisms that can maintain a constant internal temperature are called as

A. homoiothermic

B. poikilothermic

C. oilgothermic

D. heterothermic

Answer: A



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40. 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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41. Read the following statemetns and select the incorrect ones.

- (i) Homeostasis constant osmotic concentration of cells.
- (ii) The famous keoladeo National Park (Bharapur) in Rajasthan hosts thousands of migratory birds coming from Siberia, in every winter.
- (iii) 99 % of animals and nearly all plants are regulators.

(iv) The conformers are able to maintain their body temperature inspite of changes in ambient temperature.

- A. (i) and (ii)
- B. (ii) and (iii)
- C. (iii) and (iv)
- D. (i) and (iv)

Answer: C



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42. Which of the following statements is incorrect ?

- A. Osmoconformers are able to maintain osmotic concentration of their cells by either physiological or behavioural means.
- B. Most vertebrates, except the birds and mammnals are unable to thermoregulate.

- C. Success of mammals is mainly due to their ability to thermoregulate and live comfortably whether they are in Antarctica or in Sahara desert.
- D. None of these

Answer: A



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43. It can be said that some animals in their evolutionary development preferred to be conformers than regulators. Which of the following can be best suited reason for it?

- A. The metabolic reactions of these organisms can occur at a very wide range of temperature
- B. Maintaining homeostasis is an energetically expensive process
- C. The enzymes of these organisms are functional at high temperatures

D. Both (b) and (c)

Answer: B



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44. Which of the following options is correct ?

- | | | |
|----|-----------------------|-------------------------|
| A. | Homiothermic organism | Poikilothermic organism |
| | Man | Cow |
| B. | Homiothermic organism | Poikilothermic organism |
| | Cockroach | Man |
| C. | Homiothermic organism | Poikilothermic organism |
| | Lizard | Frog |
| D. | Homiothermic organism | Poikilothermic organism |
| | Cow | Frog |

Answer: D



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45. Very small animals are rarely found in polar regions because

- A. small animals have a larger surface area relative to their volume, so they lose body heat very fast when it is cold outside
- B. small animals have a smaller surface area relative to their volume, so they lose body heat very fast when it is cold outside.
- C. small body volume makes internal heat production very difficult
- D. none of these

Answer: A



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46. Which of the following is an important adaptation of animals to the cold climate ?

- A. Thin layer of body fat
- B. Aestivation
- C. Increased tendency to shiver

D. Reduced surface area to volumen ratio

Answer: D



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47. Assuming that an animal generates heat at a rate proportional to its volume and can radiate heat at a rate proportional to its body surface area, which of the following would be best at maintaining its body temperature in a cold climate ?

A. Mouse

B. Rabbit

C. Bear

D. Fox

Answer: C



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48. When organisms change their location to escape from harsh environment, it is called as

- A. hibernation
- B. vernalisation
- C. migration
- D. aestivation

Answer: C



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49. Organisms show migration in order to avoid unfavourable conditions of

- A. temperature
- B. food availability
- C. precipitation

D. all of these

Answer: D



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50. Organisms may avoid stressful conditions by suspending their activities for sometime. If they do it to avoid high temperature it is called _____ and if they do it to avoid low temperature then it is called _____

- A. aestivation, migration
- B. migration, hibernation
- C. aestivation, hibernation
- D. hibernation, aestivation

Answer: C



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51. Which of the following is an incorrect match ?

A. Bacteria - Thick walled resting spores

B. Bear - Hibernation

C. Zooplantons - Diapause

D. Lizard - Aestivation

Answer: D



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52. Match column I with column II and select the correct option from the given codes.

Column I

Column II

A. Eurythermal (i) Able to tolerate narrow range of temperature

B. Stenothermal (ii) A stage of suspended development

C. Conformers (iii) Body temperature changes with ambient temperature

D. Diapause (iv) Able to tolerate wide range of temperature

A. A – (iv), B – (i), C – (iii), D – (i)

B. A – (iv), B – (i), C – (ii), D – (iii)

C. $A - (ii)$, $B - (iv)$, $C - (iii)$, $D - (i)$

D. $A - (i)$, $B - (ii)$, $C - (iii)$, $D - (iv)$

Answer: A



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53. Adaptation may be

A. behavioural

B. morphological

C. physiological

D. all of these

Answer: D



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54. _____ is an attribute of the organism (morphological, physiological, behavioural) to survive and reproduce in its habitat.

- A. Migration
- B. Hibernation
- C. Adaptation
- D. Homeostasis

Answer: C



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55. Kangaroo and desert rat that live in conditions of water scarcity are capable of meeting all their water requirements by

- A. having a thick coat to minimise evaporative desiccation
- B. oxidising stored fat to produce water as by product
- C. producing very concentrated urine and solid faeces

D. all of these

Answer: D



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56. Read the following statements about adaptations in desert plants and select the correct ones.

- (i) They have a thick cuticle on their leaf surfaces.
- (ii) They have stomata present in deep sunken pits.
- (iii) They use CAM pathway for photosynthesis.
- (iv) They have flattened stems and large sized leaves.
- (v) Their stomata remain closed during the day.

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

B. (ii),(iii) and (v)

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

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

Answer: D



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57. Opuntia has spine like leaves which help in

- A. reducing the rate of transpiration
- B. increasing the rate of transpiration
- C. increasing the rate of photosynthesis
- D. reducing the rate of photosynthesis

Answer: A



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58. _____ rule states that mammals from colder climates generally have shorter ears and limbs to minimise heat loss.

- A. Allen's
- B. Berger's
- C. Borger's
- D. Powell's

Answer: A



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59. An inhabitant of Varanasi goes to Rohtang and experiences nausea, fatigue and heart palpitations. It is because

- A. he is experiencing altitude sickness
- B. his RBC count is lower than required
- C. he is in an area of low atmospheric pressure
- D. all of these

Answer: D

60. Archaeobacteria that flourish in temperature above 100°C have special_____molecules that do not coagulate at high temperature and remain functional.

- A. carbohydrate
- B. ester
- C. protein
- D. fat

Answer: C

61. Which of the following problems does the frequent deep sea diver organisms like whales may face ?

- A. Compression of tissues surrounding air filled cavities
- B. High blood nitrogen levels
- C. Lack of oxygen
- D. All of these

Answer: D



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

- A. development of thick layer of sub-cutaneous fat
- B. development of extra solute in body fluids
- C. development of ice nucleating protein in extra cellular spaces
- D. both (b) and (c)

Answer: D



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63. Which of the following statements is correct with regard to Bergmann's rule?

- A. Animals of colder area have large size than of hot areas.
- B. Fish of colder area have large size
- C. Birds of colder areas have narrow wings
- D. Animals of colder areas possess thick fur

Answer: A



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64. Which of the following options exemplifies a behavioural means of homeostasis ?

- A. A man sweating profusely in a hot room
- B. A rhino covering itself in mud to keep cool

C. A desert lizard basking in Sun to increase its body temperature

D. Both (b) and (c)

Answer: D



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65. A behavioural strategy of adaptation called echolocation is found in

A. bats

B. butterfly

C. praying mantis

D. arctic tern

Answer: A



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

- A. camouflage
- B. mimicry
- C. warning colouration
- D. both (a) and (b)

Answer: A



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67. Dart frogs (*Phylllobates bicolour*, *Dendrobates pumilo*) found in tropical rain forests of South America are highly poisonous as well as brightly coloured to be easily notice. This is referred to as

- A. camouflage
- B. mimicry

C. warning colouration

D. none of these

Answer: C



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68. Match column I with column II and select the correct option from the given codes.

Column I

A. An endothermic animal

B. An ectothermic animal

C. Organism of benthic zone

D. An organism exhibiting camouflage

Column II

(i) Sea anemone

(ii) Man

(iii) Lizard

(iv) Chameleon

A. A – (iv), B – (iii), C – (i), D – (ii)

B. A – (ii), B – (i), C – (iii), D – (iv)

C. A – (ii), B – (iii), C – (i), D – (iv)

D. A – (i), B – (ii), C – (iii), D – (iv)

Answer: C



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

- A. (i) distinguished (ii) evolution
- B. (i) distinguished (ii) biogenesis
- C. (i) links (ii) evolution
- D. (i) links (ii) biogenesis

Answer: C



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70. In a pond, last year there were 30 lotus plants. Through reproduction, 25 new lotus plants were added in one year while 8 plants died. The birth

and death rates for the lotus population respectively are _____ and _____ individuals per lotus per year.

A. 0.83, 0.26

B. 0.26, 0.83

C. 0.25, 0.80

D. 0.80, 0.25

Answer: A



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71. Parameters related to age structure include

A. fecundity (birth rate)

B. generation time

C. death rate

D. all of these

Answer: D



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

A. 0.25

B. 200

C. 800

D. 0.2

Answer: A



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73. 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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74. If the age distribution is plotted for a population, the resulting structure is called as

- A. age graph
- B. age curve
- C. age pyramid

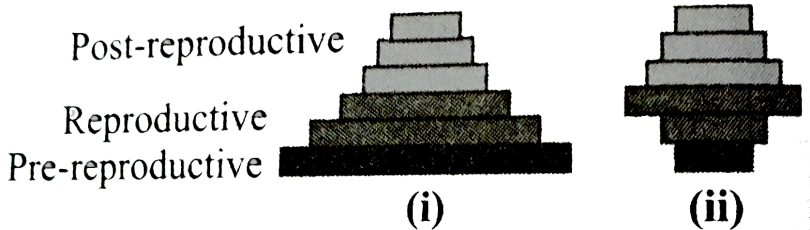
D. age diagram

Answer: C



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75. What does the shape of the given age pyramids reflects about the growth status of the related population ?



- A. (i) Expanding (ii) Stable
- B. (i) Stable (ii) Declining
- C. (i) Expanding (ii) Declining
- D. (i) Declining (ii) Stable

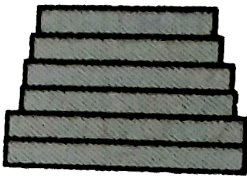
Answer: C



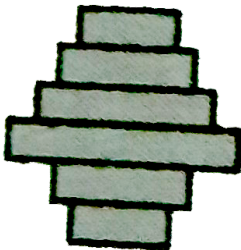
76. A population in which number of pre-reproductive individuals is very large, number of reproductive individuals is moderate while post-reproductive individuals are fewer. Which kind of age pyramid is represented by such a population ?



A.



B.



C.

D. Cannot be determined

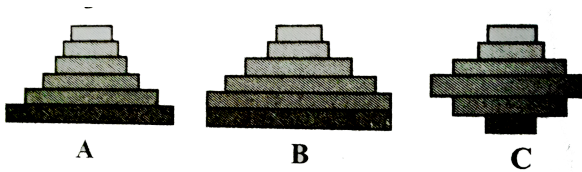
Answer: A



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77. What does the shape of the given age pyramids (A to C) reflect about the growth status of populations ?

Post-reproductive
Reproductive
Pre-reproductive



- A. (A, B, C, D), (Declining, Stable, Expanding)
- B. (A, B, C, D), (Stable, Expanding, Declining)
- C. (A, B, C, D), (Expanding, Stable, Declining)
- D. (A, B, C, D), (Declining, Expanding, Stable)

Answer: C



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78. The age structures of a population represents

- A. relative number of individuals at each age
- B. number of new borns each year
- C. number of individuals reaching puberty each year
- D. relative number of deaths at each age

Answer: A



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79. The age structures of a population influences population growth because

- A. younger females have more offsprings than do older females
- B. different age groups have different reproductive capabilities
- C. more is the number of immature individuals, slower is the growth of population

D. a shorter generation time results in slower population growth.

Answer: B



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80. If most individuals in a population are young, why is the population likely to grow rapidly in the future?

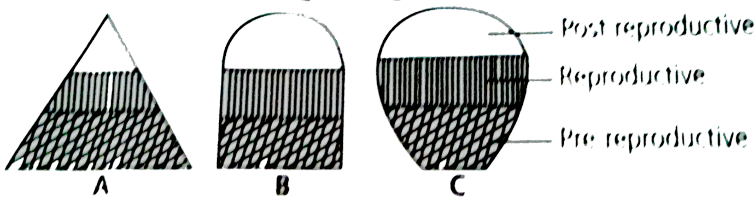
- A. Many individuals will begin to reproduce soon
- B. Death rates will be slow
- C. Immigration and emigration can be ignored
- D. All of these

Answer: A



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81. Study the age pyramids given below and select the correct statements regarding these.



A. *A* is a triangular age pyramid, where prereproductive stage is very large as compared to the reproductive and post-reproductive stages of the population. This type of age structure indicates that the population would increase rapidly.

B. *B* is an inverted bell shaped age pyramid, where number of pre-reproductive and reproductive individuals is almost equal. This type of age structure indicates that the population is stable.

C. *C* is an urn shaped age pyramid, where more number of reproductive individuals are present. This type of age structure

indicates that the population is declining.

D. All of these

Answer: D



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82. A population with a larger proportion of older individuals than younger ones will likely to

A. grow larger and then decline

B. continue to grow larger indefinitely

C. decline

D. not experience a change in population size.

Answer: C



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83. An urn shaped population age pyramid represents

- A. growing population
- B. static population
- C. declining population
- D. extinct population

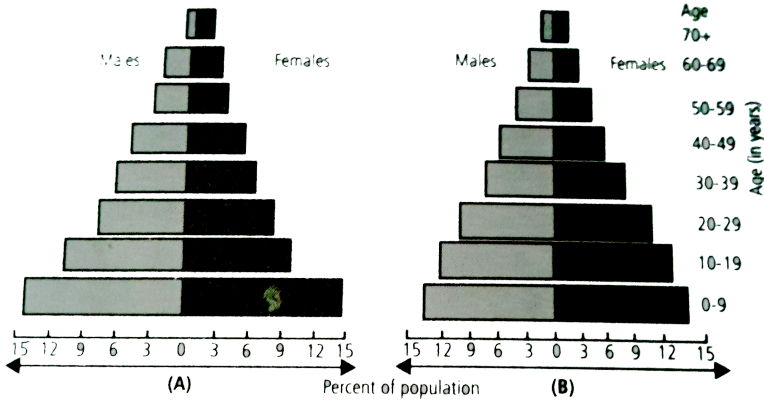
Answer: C



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84. Given figures represent comparative age-sex pyramids for India for the years 1971 (figure A) and 1991 (figure B), over the 20-year period. Study

carefully the pyramids and select the correct statement regarding these.



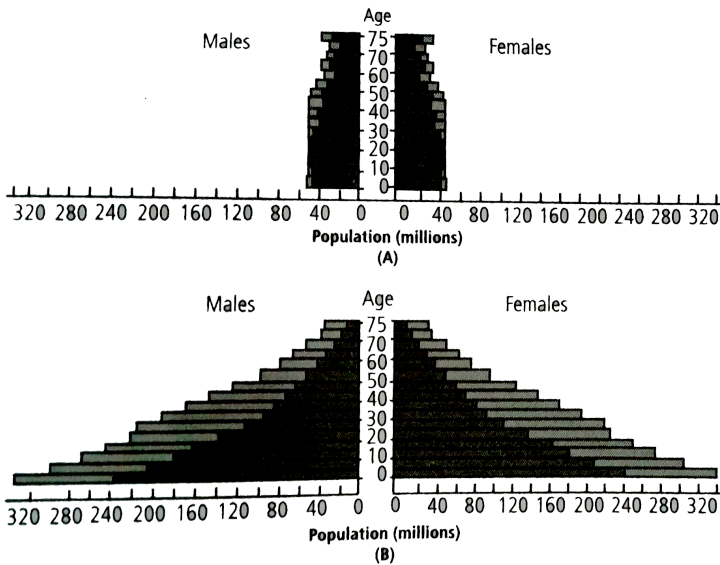
- A. Pyramid for year 1971 represents a nearly stable population.
- B. pyramid for year 1991 represents a declining population
- C. pyramid for year 1991 has a long way to go before it resembles that of a stable population.
- D. All of these

Answer: C



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85. Age-sex sturcture of a population can be depicted in the form of a pyramid by plotting the percentage of population of each sex in each age class. Two age sex pyramids are given here.



Study carefully the above age-sex pyramids and select the correct statements regarding these.

- A. A represents the age-sex pyramid for a developed country and B represents the age-sex pyramid for a developing country.
- B. B is a much less steep pyramid, representing a rapidly growing population, like that of India, as it has a much larger number of

young people.

C. A is a stepper pyramid, which represents a nearly stable population

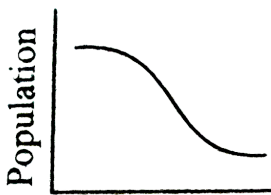
D. All of these

Answer: D

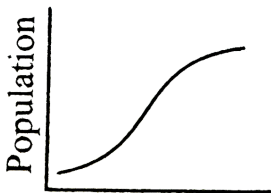


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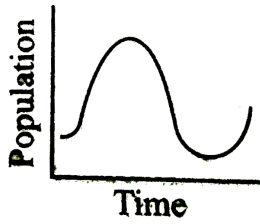
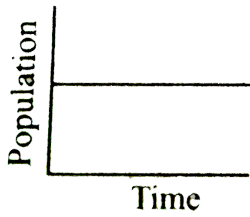
86. In a given population of 2000 individuals, 80 births and 125 deaths were reported over a given period of time. Which of the following graphs will correspond to it ?



A.



B.



Answer: A



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87. Total number of individuals of a species per unit area and per unit time is called

- A. population size
- B. population density
- C. demography
- D. population dynamics

Answer: B



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88. In some cases, population density is measured in terms of biomass rather than in terms of number because

- A. it is a more meaningful measure when the considered organisms vary greatly in size
- B. it is more convenient when population is huge and counting is impossible or very time consuming
- C. it is a relatively constant measure
- D. both (a) and (b)

Answer: D



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89. Which of the following is not an example of using relative density to measure population density in a certain area ?

- A. Counting pugmarks of tigers to find population density to tigers in a forest.
- B. Counting the number of fishes caught in a trap to find population density of fishes in a lake
- C. Measuring biomass of bacterial culture to find out population density of bacteria in a petri dish.
- D. Measuring biomass of phytoplanktons in 1 c c water to find out population density of phytoplanktons in a lake.

Answer: C



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90. For which of the following cases, population density can be easily determined by utilising non-biological parameter ?

- A. Fish density
- B. Density of bacteria in culture plate
- C. siberian of cranes at Bharatpur wetlands
- D. Tiger census

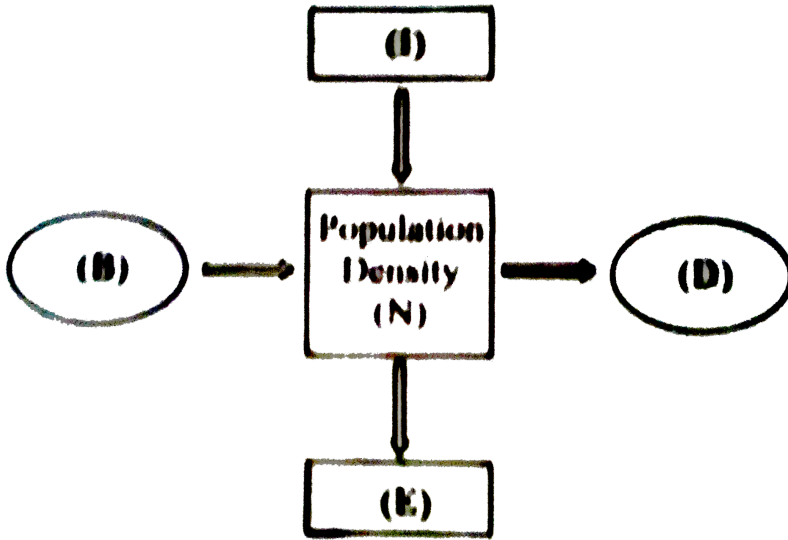
Answer: D



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91. The given figure represents different factors affecting population density (N). If B = natality D = mortality, E = emigration and I =

immigration, then select the incorrect option regarding these.



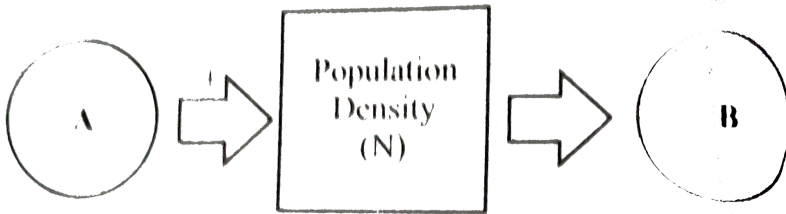
- A. B and D are most influential factors under normal conditions while I and E become important in special conditions
- B. In a new habitat just being colonised, I become more important than B
- C. B and I cause positive changes in N
- D. I is generally equal to E

Answer: D



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92. The density of a population in a given habit during a given period, fluctuates due to changes in certain basic processes. On this basis, fill up boxes *A* and *B* in the given flow chart with correct option.



- A. *A* – Natality, *B* – Mortality
- B. *A* – Immigration, *B* – Emigration
- C. *A* – Natality, *B* – Immigration
- D. Both (a) and (b)

Answer: D



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93. Which of the following is not a factor that would limit the growth of a population ?

- A. Food shortage
- B. Immigration
- C. Disease
- D. Famine

Answer: B



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94. Following table summarises the differences between natality and mortality. Select the incorrect ones.

Natality

- (i) Natality is number of births per unit population per unit time.
- (ii) It adds new individuals to the population.
- (iii) It increase the size of population.
- (iv) It increase population density.
- (v) It is low when population size is small and high when population size is large.

- A. (i) and (v)
- B. (iii) and (iv)
- C. (iv) only
- D. (v) only

Answer: D



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95. Which of the following factors has a negative effect on the population growth rate ?

- A. Emigration
- B. Immigration
- C. Natality
- D. Fecundity

Answer: A

96. If $N =$ population density at time t , then population density at time $t + 1$ can be written as. $N_{t+1} = N_t + [(A + B) - (C + D)]$. Select the correct option for A, B, C and D in the above equation.

- A. A can be mortality and B can be natality
- B. B can be immigration and C can be natality
- C. C can be mortality and D can be immigration
- D. A can be natality and D can be emigration.

Answer: D

97. Which of the following factors influence population density under normal conditions ?

- A. Deaths
- B. Immigration
- C. Emigration
- D. Both (a) and (c)

Answer: A



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98. Which of the following statements is/are incorrect ?

- A. A population has certain attributes which an individual does not have.
- B. Tiger census in our National parks and tiger reserves is often based on pug marks.
- C. If a new habitat is being colonised birth rate may contribute more significantly to population growth.

D. Both (a) and (c)

Answer: C



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99. Exponential growth is observed in a population when

- A. resources in the habitat are unlimited
- B. each species has the ability to realise its full innate potential
- C. both (a) and (b)
- D. none of these

Answer: C



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

A. 0.23

B. 0.07

C. 0.05

D. 0.25

Answer: B



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101. The birth and death rates of four countries are given below. Which one will have the least population growth rate ?

Country	Birth rate / 1000	Death rate / 1000
P	15	5
Q	25	10
R	35	18
S	48	41

A. P

B. Q

C. R

D. S

Answer: D



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102. Which of the following equations correctly represents the exponential population growth curve ?

A. $dN/dt = rN$

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

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

D. Both (a) and (c)

Answer: D



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103. 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: D



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

- A. fecundity
- B. surviving ability

C. carrying capacity

D. biotic potential

Answer: C



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

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

B. $dN/dt = \frac{rN}{K}$

C. $dN/dt = \frac{N(K - N)}{K}$

D. $dN/dt = \frac{r(K - N)}{K}$

Answer: A



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106. The population growth is generally described by the following equation : $\frac{dN}{dt} = rN\left(\frac{K - N}{K}\right)$ What does 'r' represent in the given equation ?

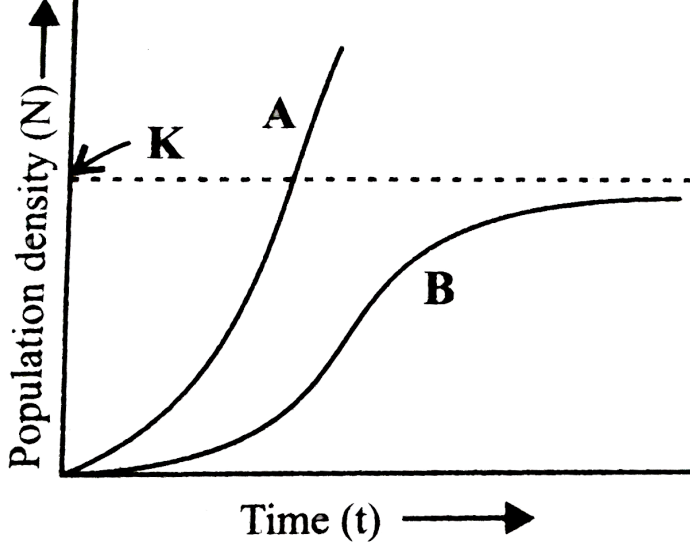
- A. Population density at time 't'
- B. Intrinsic rate of natural increase
- C. Carrying capacity
- D. The base of natural logarithm

Answer: B



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107. Study the population growth curves (*A* and *B*) in the given graph and select the incorrect option.



A. Curve 'A' shows exponential growth, represented by equation

$$\frac{dN}{dt} = rN.$$

B. Curve 'B' shows logistic growth, represented by equation

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

C. Exponential growth curve is considered as more realistic than the logistic growth curve.

D. Curve 'A' can also be represented by equation $N_t = N_0 e^{rt}$.

Answer: C



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108. Which of the following statements is correct ?

- A. The number of organisms always decrease but never increase 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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109. Species interaction with negative influence on both is referred to as

A. amensalism

B. mutualism

C. commensalism

D. competition

Answer: D



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

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

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

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

- (i) (ii) (iii).
- C. Competition Parasitism Commensalism
- D. Both (b) and (c)

Answer: D



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111. Refer to the given table that summarises the interactions between two organisms (organisms 1 and organism 2). Identify the types of interaction (A,B and C) and select the correct answer.



- (i) *A* can be either predation or parasitism.
- (ii) *B* can be either commensalism or amensalism.
- (iii) *C* can be amensalism.
- (iv) *A* can be amensalism.

- A. (i) and (ii)
- B. (ii) and (iii)
- C. (iii) and (iv)

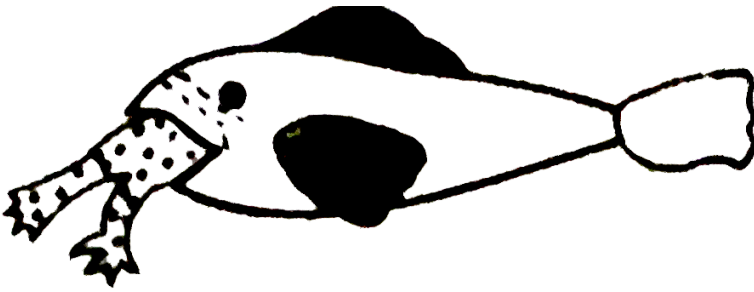
D. (i) and (iii)

Answer: D



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112. Which type of interaction is being shown in the given figure ?



A. Parasitism

B. Commensalism

C. Predation

D. Amensalism

Answer: C



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113. Which of the following is an advantage of predation ?

- A. It serves as conduits for energy transfer across trophic levels.
- B. It keeps population of organisms of lower trophic level under control.
- C. Predators help in maintaining species diversity in a community, by reducing the intensity of competition among competing prey species.
- D. All of these

Answer: D



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

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

Statement 2: When certain exotic species are introduced into a geographical fast because the invaded lands does not have its natural predators.

- A. Both statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct
- D. Both statements 1 and 2 are incorrect

Answer: A



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115. The prickly pear cactus became unusually abundant after its introduction in Australia, because it

- A. had no coevolved herbivores
- B. formed new mycorrhizal association
- C. lost its thorns
- D. all of these

Answer: A



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116. Why you never see cattle or goats browsing on weed Calotropis ?

- A. The plant produces highly poisonous tannins.
- B. The plant produces quinine which is bitter in taste.
- C. The plant produces poisonous cardiac glycosides.
- D. The plant bears prickles.

Answer: C



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117. Which of the following is not an example of prey- predator relationship?

- A. Tigar eating a deer
- B. Plant *Nepenthes* trapping an insect
- C. Bacteria decomposing organic matter
- D. Crocodile killing a man

Answer: C



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118. On the rocky sea coasts of Scotland, the larger and competitively superior barnacle *Balanus* dominates the intertidal area and excludes the

smaller barnacle *Cathamalus* from that zone. Which kind of interaction is being depicted by this example ?

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

Answer: D



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119. Competitive exclusion principle stating that inferior species is eliminated eventually after prolonged competition was given by

- A. Allen
- B. Pearl-Verhulst
- C. Gause

D. Darwin.

Answer: C



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120. Two different species cannot live for long duration in the same niche or habitat. This law is called

- A. Allen's law
- B. Gloger rule
- C. Competitive exclusion principle
- D. Weisman's theory

Answer: C



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

- A. competitive exclusion, Gause
- B. competitive exclusion, MacArthur
- C. resource partitioning, Gause
- D. resource partitioning, MacArthur

Answer: D



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122. When two similar species live in the same area, they may evolve to become more different in order to

- A. drive the other species to extinction
- B. reduce competition

C. use up the other species resources

D. reduce genetic variation

Answer: B



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123. Which of the following statements is/are correct ?

A. Two species may not live in the same habitat.

B. The more dissimilar the niches of two species, the stronger is competition between them

C. No two species can occupy exactly the same niche in the same geographical area.

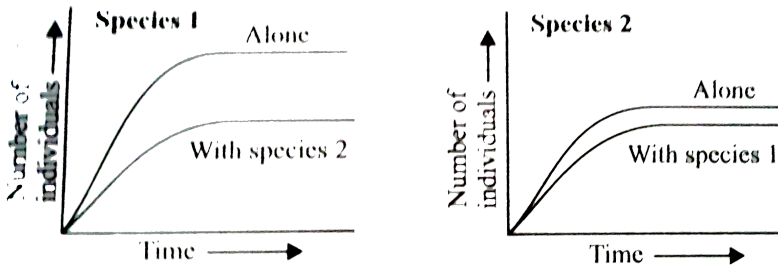
D. All of these

Answer: C



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124. In laboratory experiments, two species of the protist *Paramecium* (species 1 and 2) were grown alone and in the presence of the other species. The following graphs show growth of species 1 and species 2, both alone and when in mixed culture with the other species.



Which of the

following conclusions can be drawn from the graphs ?

- A. Competitive exclusion occurred in these experiments.
- B. Both species are affected by interspecific competition but species 1 is affected less.
- C. Both species are affected by interspecific competition but species 2 is affected less.
- D. Both species are affected equally by interspecific competition.

Answer: C



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

Statement 1: Brood parasitism in birds is an example of parasitism in which the parasitic bird lays its eggs in the nest of its host and the host incubates them.

Statement : During the course of evolution, the eggs of the parasite bird have evolved to resemble the host's eggs in size and colour to reduce the chances of the host bird detecting the foreign eggs and removing them from the nest.

- A. Both statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct
- D. Both statements 1 and 2 are incorrect

Answer: A



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126. Cowbirds lay their eggs in the nests of smaller birds. The fast-developing cowbird chicks hatch first, then push the other baby chicks out of the nest as they hatch. The cowbird is classified as a

- A. pathogen
- B. parasite
- C. mutualist
- D. commensal

Answer: B



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127. Which of the following statements is/are incorrect ?

- (i) The liver fluke, a parasite, depends on intermediate hosts (a snail) to complete its life cycle.
- (ii) The malarial parasite needs a vector (mosquito) to spread to other host organisms.
- (iii) In case of brood parasitism, the eggs of parasitic birds are not detected and removed from the nest because the parasite's eggs resemble the host's eggs in morphology and colour.
- (iv) A population of frogs protected from all predators would increase indefinitely.

A. (i) and (iv)

B. (iii) and (iv)

C. Only (i)

D. None of these

Answer: D



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128. Read the given examples of animal interactions.

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

A. Competition

B. Amensalism

C. Mutualism

D. Commensalism

Answer: D



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129. An interaction between two individuals where one is benefitted while the other is neither benefitted nor harmed is called as

- A. predation
- B. symbiosis
- C. amensalism
- D. Commensalism

Answer: D



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130. Which of the following exhibits mutualism ?

- A. Mycorrhizae living on the roots of higher plants.
- B. Wasps pollinating fig inflorescence.
- C. Sea anemone often found on the shell of hermit crab
- D. All of these

Answer: D



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131. The plant-animal interactions often involve co-evolution of the mutualists so that

- A. the mutually beneficial system could be safeguarded against 'cheaters'
- B. a given plant species can be pollinated only by its partner animal species and no other species
- C. the animal utilises plant not only for ovipositions but also to pollinate the plant
- D. all of these

Answer: D



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

- A. mutualism
- B. co-evolution
- C. commensalism
- D. co-operation.

Answer: B



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

Statement 1 : Plants need the help of insects and animals for pollinating their flowers and dispersing their seeds.

Statement 2: Plants offer rewards in the form of pollen and nectar for pollinators and juicy and nutritious fruits for seed dispersers.

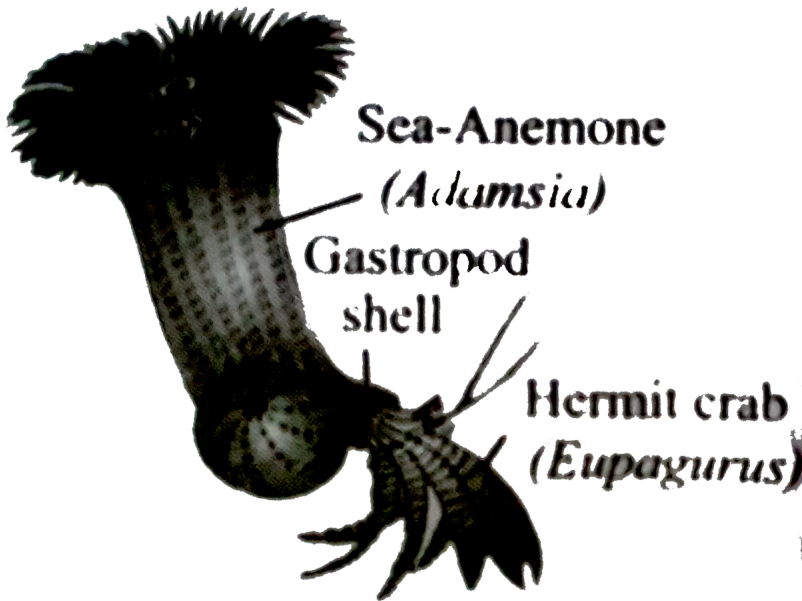
- A. Both statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct
- D. Both statements 1 and 2 are incorrect

Answer: A



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134. Which type of interaction is represented by the given figure ?



- A. Mutualism
- B. Parasitism
- C. Helotism
- D. Amensalism

Answer: A



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135. Match column I with column II and select the correct option from the given codes.

Column I

- A. Ladybird beetles feeding on insects
- B. Barnacles growing on the back of a whale
- C. Wasp pollinating the fig inflorescence
- D. Lice living on skin of humans

Column II

- (i) Mutualism
- (ii) Predation
- (iii) Competition
- (iv) Commensalism
- (v) Parasitism

A. $A - (iii), B - (iv), C - (i), D - (v)$

B. $A - (iv), B - (iii), C - (iv), D - (i)$

C. $A - (ii), B - (i), C - (v), D - (iv)$

D. $A - (iii), B - (ii), C - (i), D - (iv)$

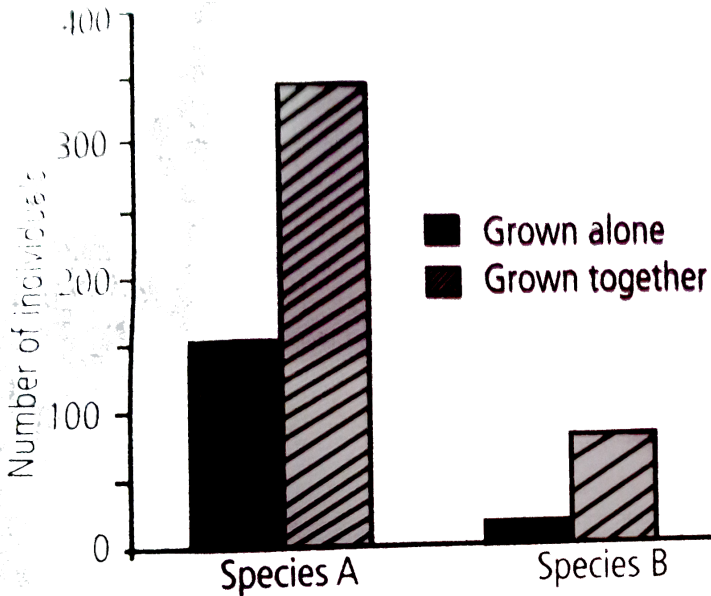
Answer: A



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Hots

1. Two insect species were used in a laboratory experiment. For one treatment, both species were grown by themselves (in separate chambers) on a suitable food source. For the second treatment, the two species were grown together (in the same chamber) on the same type and amount of food as in the first treatment. The given figure shows the results (the number of individuals of each species in the two treatments) at the end of the experiment. Based on these results the two species should be classified as



A. competitors

B. mutualists

C. predators of pathogens

D. commensalists

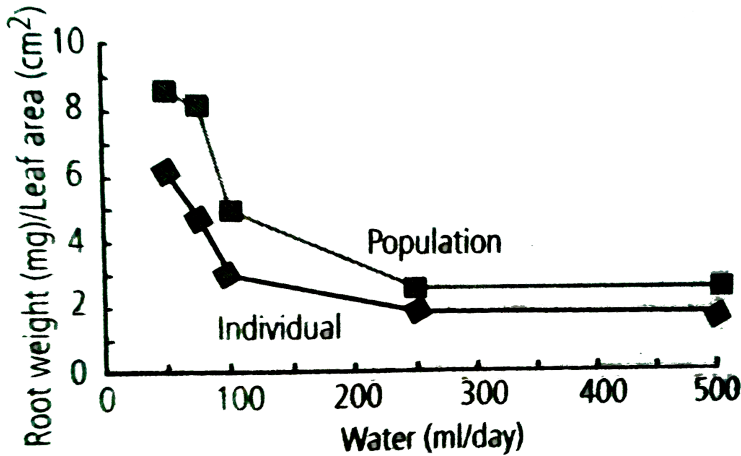
Answer: B



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2. To determine the effect of intra-specific competition on the growth of saplings of *Eucalyptus dives*, an experiment was designed in which two sets of pots were used. In the first set only 1 sapling was planted per pot. To check for the effect of intra-specific competition on allocation to each set. the results have been graphically indicated below. Which of the

following conclusions can be best drawn from the study ?

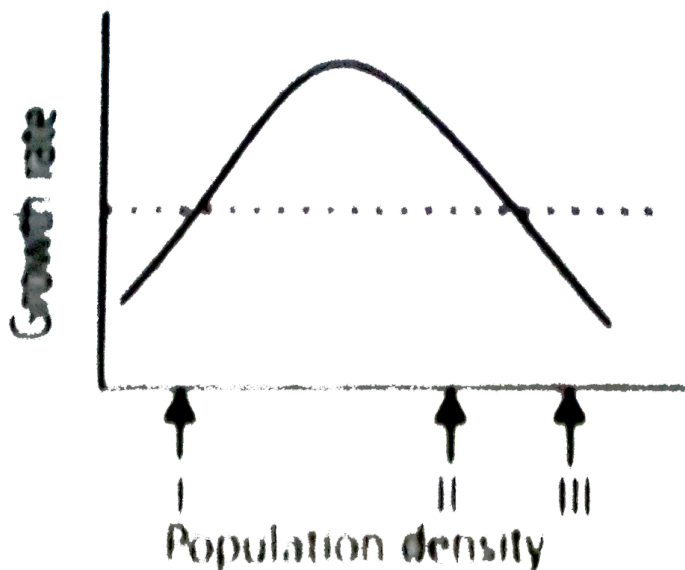


- A. More resources are allocated to the root during low water conditions.
- B. Competition for water among individuals of a population causes more root growth as compared to individuals who are growing alone.
- C. Lesser leaves are formed under low water conditions
- D. Root growth is higher in individuals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

Answer: B

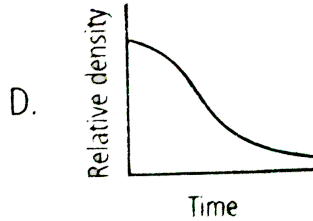
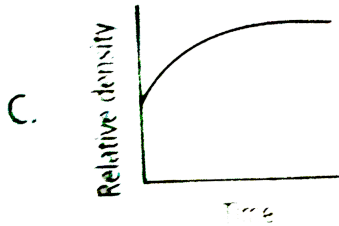
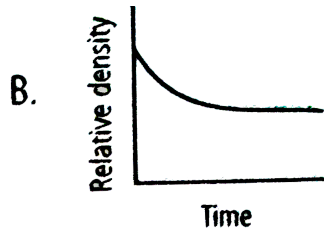
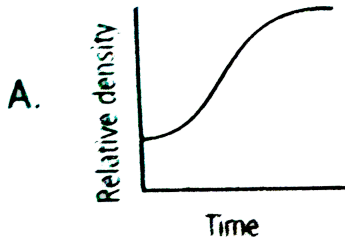


3. The relationship between population density (N_t) and population growth rate ($R = N_{t+1}/N_t$) in a certain animal species is shown below.



Choose from the following graphs the appropriate populations growth patterns that would be obtained if the population is at the densities (I, II, III) shown in the graph above. [Note : The y-axis in A to D is relative

density that cannot be compared to the absolute density in the figure]



A. *I – A, II – B, III – C*

B. *I – D, II – C, III – B*

C. *I – B, II – C, III – D*

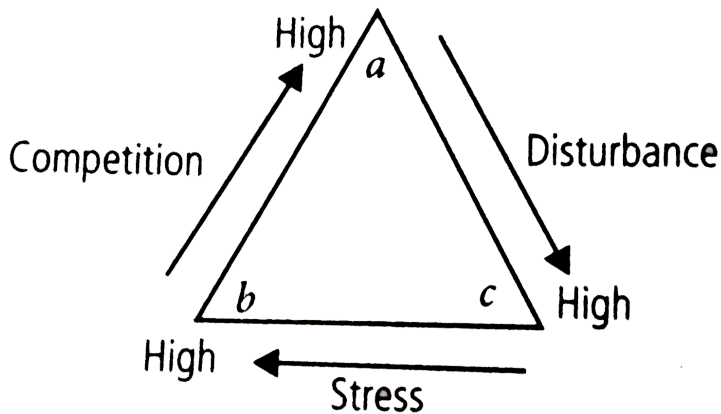
D. *I – C, II – A, III – B*

Answer: B



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4. The figure below depicts life-history strategies for three plant species (a, b and c) along 3 axes : strength of competition with other organisms, level of disturbance in the habitat, and level of environmental stress in the habitat. Species a grows in habitats where competition among species b grown in habitats with and stress are low. Species b grows in habitats with high environmental stress but with low interspecies competition. Species c grows in highly disturbed habitats with low environmental stress.



Which of the

statements below is/are correct ?

- I. Characteristics of "a-type" plants are faster growth rate and short-lived leaves.
- II. Desert annual plants are "b-type" species. they have rapid growth and

produce large amount of seeds in a short time after rains.

III. Most plants belonging to "c-type" species would be herbaceous while "a-type" and "b-types" species are likely to be trees or shrubs.

- A. Only II
- B. I and II
- C. I and III
- D. II and III

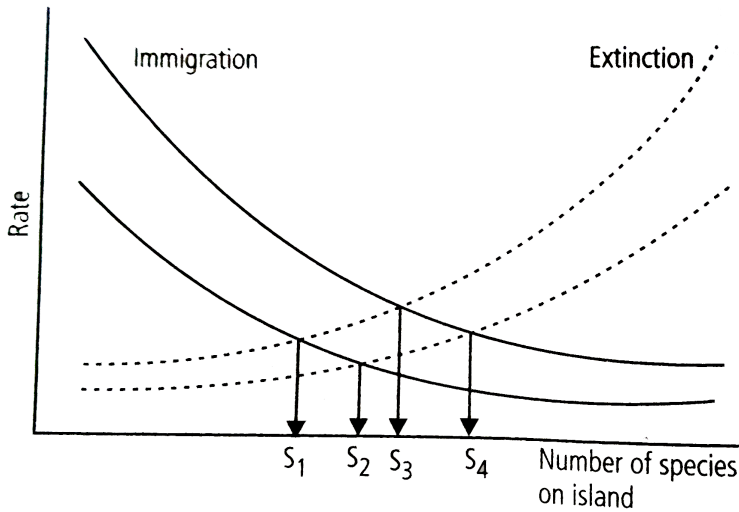
Answer: D



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5. Island biogeography theory states that the number of species on an island is determined by immigration rates of new species to the island and extinction rates of species on the island. Immigration rates to an island decline as its distance from the mainland increases and extinction rates decrease with increasing island size. When the immigration and extinction rates on an island are equal, the number of species on the

island reaches equilibrium.



Which of the following gives the correct combination of distance (near and far) and area (small and large of islands where species ($S_1 - S_4$) occur ?

- A. S_1 — near island, small island
- B. S_2 — near island, large island
- C. S_3 — small island, far island
- D. S_4 near island, large island

Answer: D



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1. Autecology is the

- A. relation of heterogenous 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: A::B



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2. Ecotone is

- A. a polluted area
- B. the botton 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 in 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



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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. 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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6. 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: D



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

A. $18 - 25^{\circ}C$ and $150 - 400cm$

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

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

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

Answer: A



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8. 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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9. What will happen to a wall 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 plant gets more sunlight.

Answer: C



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10. If a population of 50 Paramecium present in a pool increases to 150 after an hour, what would be the 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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11. What would be the per cent growth or birth rate per individual per hour for the same population mentioned in the previous question (Question 10)?

- A. 100
- B. 200

C. 50

D. 150

Answer: B



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

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

Answer: B



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

- A. Natality $>$ mortality
- B. Immigration $>$ emigration

C. Mortality and emigration

D. Natality and immigration

Answer: C



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15. 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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16. 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 is predicted as

- A. 25 millions
- B. 17 millions
- C. 20 millions
- D. 18 millions

Answer: B



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17. 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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18. 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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19. Which of the following is a partial root parasite ?

A. Sandal wood

B. Mistletoe

C. Orobanche

D. Ganoderma

Answer: A



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

A. Banana plant

B. Mango

C. Tomato

D. Eucalyptus

Answer: C

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Assertion Reason

1. Assertion : Prolonged intraspecific competition causes an increases in the size of the niche of a population.

Reason : In such a population, use of a new type of resource will increase through the generations.

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2. Assertion : The community of an ecotone commonly contains the organisms of each of the overlapping communities and in addition the organisms which are restricted to the ecotone.

Reason : The tendency for increased variety and density at community junctions is known as the edge effect.

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3. Assertion : Stomata generally open in light and close in dark.

Reason : Transpiration is enhanced by heating effect of light.



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4. Assertion : The aquatic organisms in which the osmotic concentration and temperature of body change according to the ambient conditions of water are referred to as conformers.

Reason : Aquatic organisms are able to maintain homeostasis through thermoregulation and osmoregulation by physiological or behavioural means.



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5. Assertion : Small sized animals are rarely found in polar regions.

Reason : Small sized animals have larger surface area relative to their volume and they have to spend much energy to generate body heat through metabolism.



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6. Assertion : At high altitude a person, from plain areas, may experience altitude sickness.

Reason : At high altitude atmospheric pressure is generally high leading to symptoms like nausea, fatigue, etc.



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7. Assertion : Bell shaped age pyramid represents a stable population.

Reason : In a stable population, proportion of individuals in reproductive age group is higher than the individuals in pre-reproductive age group.



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8. Assertion : The rate at which a population can be expected to grow in the future can be assessed graphically by means of a population pyramid.

Reason : A triangular population pyramid is characteristics of a country whose population is stable, neither growing nor shrinking.



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9. Assertion : A population growing in a habitat with limited resources shows initially a lag phase, followed by phase of accelerated and deceleration and finally as asymptote, when the population density reaches the carrying capacity.

Reason : In Verhulst-Pearl Logistic growth, plot of N (population density) at time (t) results in a sigmoid curve.



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10. Assertion : Predators maintain species diversity.

Reason : Predators reduce the intensity of competition among competing prey species.



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

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



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12. Assertion : External parasitism is generally marked by much more extreme specialisation than internal parasitism.

Reason : The structure of an internal parasite is usually very complex possessing suckers, reproductive organs, etc.



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13. Assertion : The epiphytes use the trees only for attachment and manufacture their own food by photosynthesis.

Reason : Commensalism results in negative effects on the growth and survival of one or both of the populations.



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14. Assertion : Mycorrhizae represent a mutually beneficial interspecific interaction of fungi with roots of higher plants.

Reason : In a mutualistic relationship, both the organisms enter into some sort of physiological exchange.



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15. Assertion : Plant-animal interactions do not generally involve co-evolution of the mutualist organisms.

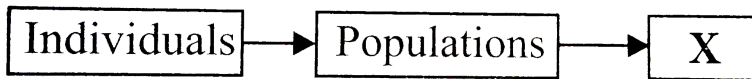
Reason : Evolution of the plants and animals can never go side by side.



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Organisms And Population

1. Refer to the given flow chart.



Identify X and select the correct option.

- A. Communities
- B. Biospheres
- C. Biomes
- D. Species

Answer: A

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2. Basic unit of ecological hierarchy is

- A. population
- B. community
- C. ecosystem
- D. individual

Answer: D



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3. Several plant and animal species present together at a place constitute

a

- A. genus
- B. population
- C. biome
- D. community

Answer: D



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4. The branch of science which studies the interactions among organisms and between organisms and physical environment is called as

A. epidemiology

B. ecology

C. ethology

D. etiology

Answer: B



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5. Niche overlap indicates

- A. mutualism between two species
- B. active cooperation between two species
- C. two different parasites on the same host
- D. sharing of one or more resources between the two species

Answer: D



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

Statement 1 : Cow in india and Kangaroo in Australlia (both herbivores) are ecological equivalents.

Statement 2: The organisms having smallar niche in different geographical regions are known as ecological equivalents.

- A. Both Statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct

D. Both statements 1 and 2 are incorrect

Answer: A



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

Statement 1 : Study of a single individual or a population in relation to environment is called autecology.

Statement 2 : Study of group of individuals or a community in relation to environment is known as synecology.

- A. Both statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct
- D. Both statements 1 and 2 are incorrect

Answer: A



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8. Seasonal variations on Earth occur due to its

- A. tilted axis
- B. rotation around its own axis
- C. revolution around sun
- D. both (a) and (c)

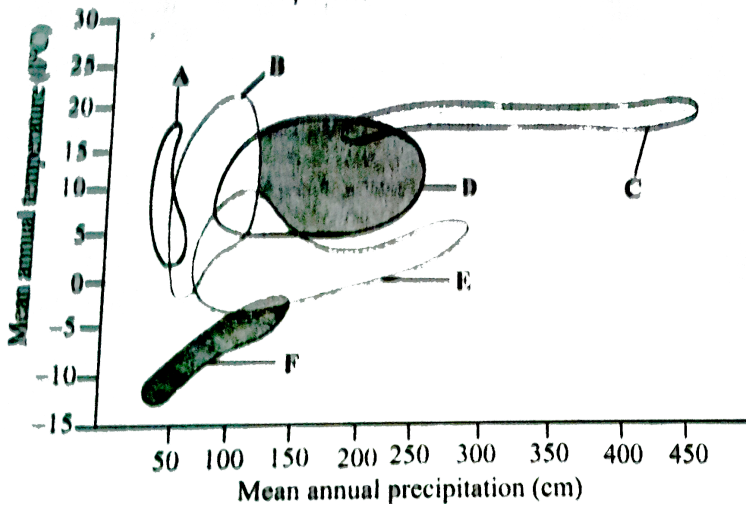
Answer: D



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9. In the given figurem identify the temperate forest and coniferous forest respectively from the markings $A - F$ and select the correct

option.



A. A and B

B. B and D

C. D and E

D. C and F

Answer: C



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10. Different biomes are formed due to annual variations in _____ over the earth's surface.

- A. temperature
- B. precipitation
- C. incident solar radiation
- D. all of these

Answer: D



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11. Deserts, rain-forest, tundra etc, are examples of

- A. community
- B. biome
- C. ecosystem
- D. population

Answer: B



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12. Characteristics of a terrestrial biome are strongly influence by its

- A. flora
- B. climate
- C. fauna
- D. all of these

Answer: D



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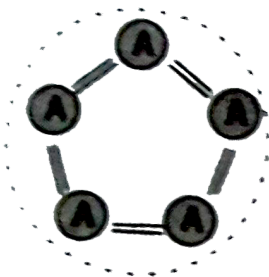
13. _____occurs in equatorial regions where rainfall and warmth are abundant, while _____biomes lacks rain.

- A. Desert,temperate
- B. Tropical rain forest, desert
- C. Tundra, savannah
- D. Desert, chapparal

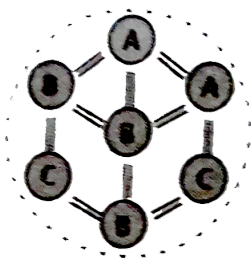
Answer: B

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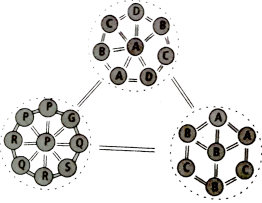
14. If A, B, C, D, G, P, Q, R and S represent different species then which of the following figures symbolizes a biome ?



A.



B.



C.

D. None of these

Answer: C



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15. The key elements that determine differences in environmental conditions of different habitats include

A. temperature

B. light

C. soil

D. all of these

Answer: D



Watch Video Solution

16. Which of the following is not a part of an organism's physical environment ?

A. Temperature

B. Light

C. Other organisms

D. Humidity

Answer: C



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17. Which of the following statements is incorrect ?

- A. Average temperature decrease progressively from plains to the mountain tops.
- B. Average temperature decrease progressively from the equator towards the poles
- C. Temperature affects the kinetics of enzymes and through it the basal metabolism of organisms
- D. None of these

Answer: D



Watch Video Solution

18. Mango trees do not and cannot grow in temperate regions. The most important environmental factor responsible for its is

- A. soil

B. temperature

C. water

D. light

Answer: B



Watch Video Solution

19. Temperature is considered as the most ecologically relevant environmental factor because it affects or organisms.

A. physiology

B. morphology

C. geographical distribution

D. all of these

Answer: D



Watch Video Solution

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

- (i) Organisms capable to tolerate a wide range of temperature are called stenothermal organisms.
- (ii) Thermal tolerance of different species determine their geographical distribution to a large extent
- (iii) Average temperature in tropical deserts in summer is $< 50^{\circ}C$.
- (iv) Thermal springs cannot sustain life due to very high average temperature i.e., $> 100^{\circ}C$.

A. (i) only

B. (ii) only

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

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

Answer: B



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21. Which of the following options is correct ?

- | | | |
|----|-----------------------|----------------------|
| A. | Stenothermal organism | Eurythermal organism |
| | Frog | Lizard |
| B. | Stenothermal organism | Eurythermal organism |
| | Frog | Man |
| C. | Stenothermal organism | Eurythermal organism |
| | Man | Lizard |
| D. | Stenothermal organism | Eurythermal organism |
| | Polar bear | Coconut tree |

Answer: B



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22. Water is the second most important factor influencing life of organisms because

- A. it makes major part of an organism's body
- B. productivity of plants depend upon availability of water
- C. life on Earth originated in water
- D. both (a) and (b)

Answer: D



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23. Organisms that can tolerate a wide range of salt concentration are termed as

- A. stenosaline
- B. stenohaline
- C. euryhaline
- D. eurysaline

Answer: C



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24. A freshwater organism cannot survive in a water body that has greater ____ than its original habitat.

- A. oxygen content
- B. depth
- C. salt concentration
- D. water clarity

Answer: C



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25. Life is sustainable with water only because

- A. it makes 90 % of the protoplasm
- B. translocation of nutrients inside the body occurs with the help of water
- C. water loss in form of sweating helps to maintain body temperature
- D. all of these

Answer: D



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26. A place has very scanty rainfall, the dominant plants there may be

- A. Opuntia
- B. Nymphaea
- C. Asparagus
- D. both (a) and (c)

Answer: D



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27. Many freshwater organisms cannot live for long in seawater because the surrounding water will be _____ to body cells and _____ may occur.

- A. hypertonic, exosmosis
- B. hypertonic, endosmosis

C. hypotonic, exosmosis

D. hypotonic, ednosmosis

Answer: A



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28. Three water bodies were tested for salinity of water. Water body X showed salt concentration as 3 parts per thousand Y showed 35 parts per thousand and Z showed 110 parts per thousand salinity.

A. X can be a lagoon

B. Y can be a sea

C. Z ca be an inland river

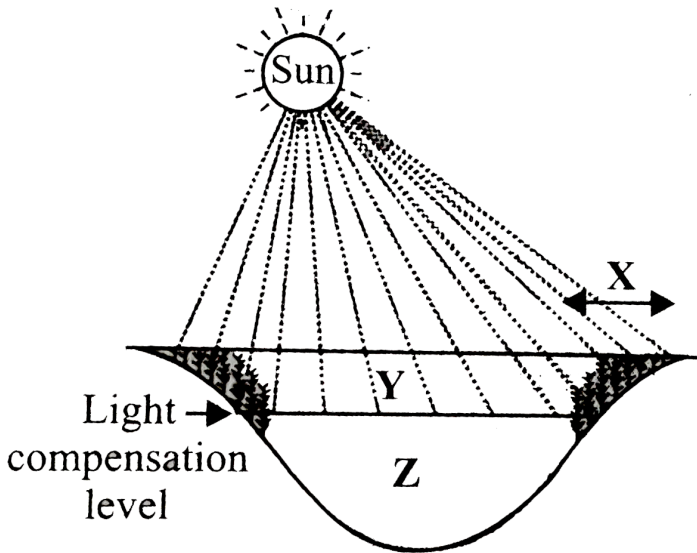
D. None of these

Answer: B



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29. Given figure represents the different zones of a lake or a pond.



Identify the labelled parts X , Y and Z and select the correct statement.

- A. X constitutes the shallow water banks and is called as littoral zone
- B. Y constitutes the open water zone upto which light can penetrate and is called as profundal zone.
- C. Z constitutes the deep water zone where light cannot penetrate and is called as limnetic zone.
- D. All of these

Answer: A



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30. Many animals use the diurnal and seasonal variations in light intensity and photoperiod to time their

- A. migration
- B. reproductive activities
- C. suspension
- D. all of these

Answer: D



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31. Nature and properties of soil depends upon

- A. climate
- B. weathering process
- C. development of soil
- D. all of these

Answer: D



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32. 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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33. Which of the following statements is incorrect ?

- A. The flora of a place is heavily defined by availability and quality of water.
- B. The availability of light on land is closely linked with that of temperature since sun is the source for both
- C. Topography does not affect biodiversity
- D. Soil composition also affects the seepage of water into ground.

Answer: C



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

- (i) All the colour components of the visible spectrum are available for marine plants living in different depths of the ocean.

(ii) Many herbs and shrubs in rainforests adapt to photosynthesise optimally under very low light conditions as they grow under canopy trees

(iii) Gradual increase in average global temperature will affect the distributional range of some species.

(iv) The quality of soil does not depend upon the weathering process.

A. (i) and (ii)

B. (ii) and (iv)

C. (ii) and (iii)

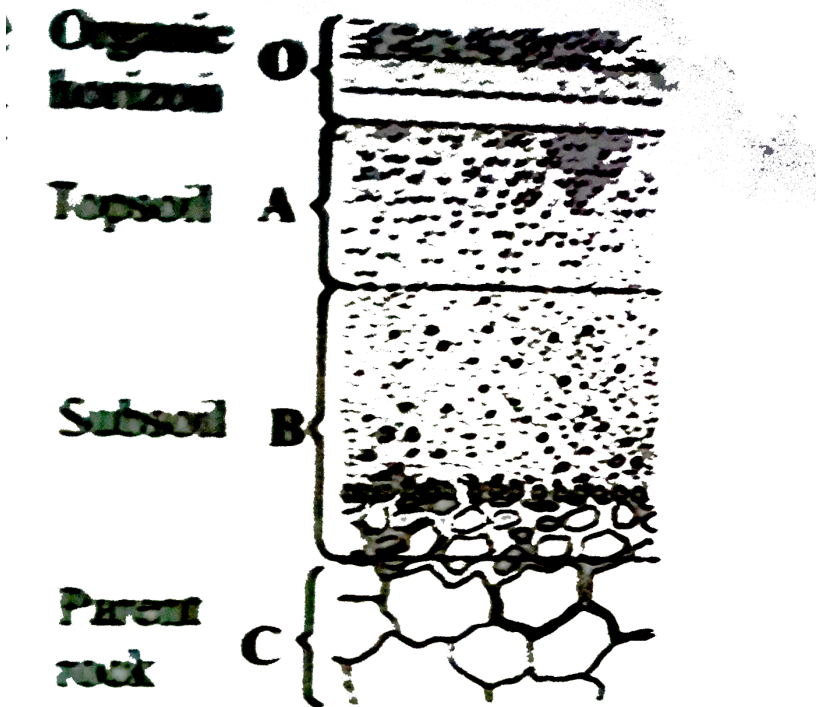
D. (i) and (iv)

Answer: C



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35. Given figure represents the soil profile, showing different layers/horizons of soil. Which of the following statements regarding the soil profile are not true ?



- (i) Maximum roots of plants are found in horizon *A*.
- (ii) Maximum nutrients are present in horizon *B*.
- (iii) Horizon *B* contains partly weathered rocks.
- (iv) Horizon *C* contains roots of the plants and mineral salts.

A. (i) and (ii)

B. (i) and (iii)

C. (ii) and (iv)

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

Answer: C



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36. An animal that can survive at $10^{\circ}C$ and $40^{\circ}C$ both, can be placed under the category of

A. conformers

B. regulators

C. migratory organisms

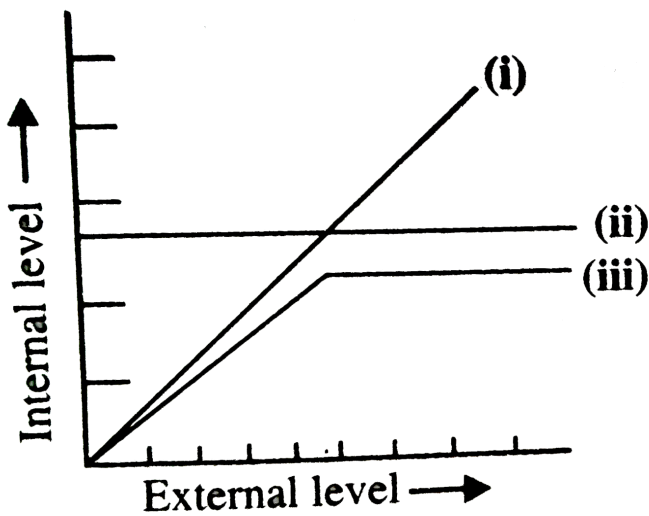
D. modifiers

Answer: B



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37. Given graph represents the response of organisms to various abiotic factors. On this basis, select the correct option for (i), (ii) and (iii)



- A. (i) (ii) (iii).
 Conformers Regulators Partial regulators
- B. (i) (ii) (iii).
 Regulators Partial regulators Conformers
- C. (i) (ii) (iii).
 Partial regulators Regulators Conformers
- D. (i) (ii) (iii).
 Regulators Conformers Partial regulators

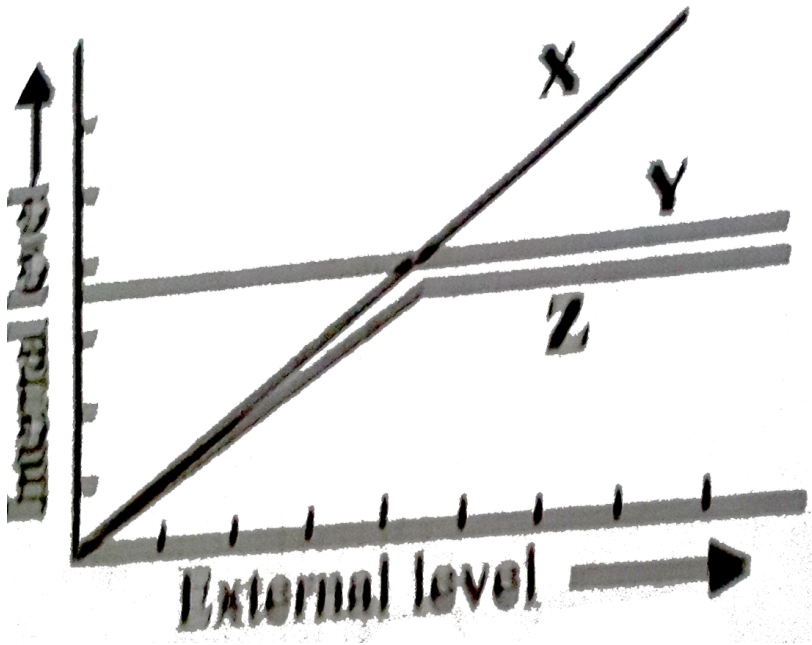
Answer: A



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

and select the correct option regarding X,Y and Z.



- A. X could be a mammal
- B. Y could be a bird
- C. Z could be a mammal
- D. X could be a bird

Answer: B



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39. Organisms that can maintain a constant internal temperature are called as

- A. homoiothermic
- B. poikilothermic
- C. oilgothermic
- D. heterothermic

Answer: A



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40. 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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41. Read the following statements and select the incorrect ones.

- (i) Homeostasis constant osmotic concentration of cells.
- (ii) The famous Keoladeo National Park (Bharapur) in Rajasthan hosts thousands of migratory birds coming from Siberia, in every winter.
- (iii) 99 % of animals and nearly all plants are regulators.
- (iv) The conformers are able to maintain their body temperature in spite of changes in ambient temperature.

- A. (i) and (ii)
- B. (ii) and (iii)
- C. (iii) and (iv)
- D. (i) and (iv)

Answer: C



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42. Which of the following statements is incorrect ?

- A. Osmoconformers are able to maintain osmotic concentration of their cells by either physiological or behavioural means.
- B. Most vertebrates, except the birds and mammals are unable to thermoregulate.
- C. Success of mammals is mainly due to their ability to thermoregulate and live comfortably whether they are in Antarctica or in Sahara desert.
- D. None of these

Answer: A



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43. It can be said that some animals in their evolutionary development preferred to be conformers than regulators. Which of the following can be best suited reason for it?

- A. The metabolic reactions of these organisms can occur at a very wide range of temperature
- B. Maintaining homeostasis is an energetically expensive process
- C. The enzymes of these organisms are functional at high temperatures
- D. Both (b) and (c)

Answer: B



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44. Which of the following options is correct ?

- | | | |
|----|-----------------------|-------------------------|
| A. | Homiothermic organism | Poikilothermic organism |
| | Man | Cow |
| B. | Homiothermic organism | Poikilothermic organism |
| | Cockroach | Man |
| C. | Homiothermic organism | Poikilothermic organism |
| | Lizard | Frog |
| D. | Homiothermic organism | Poikilothermic organism |
| | Cow | Frog |

Answer: D



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45. Very small animals are rarely found in polar regions because

- A. small animals have a larger surface area relative to their volume, so they lose body heat very fast when it is cold outside
- B. small animals have a smaller surface area relative to their volume, so they lose body heat very fast when it is cold outside.
- C. small body volume makes internal heat production very difficult
- D. none of these

Answer: A



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46. Which of the following is an important adaptation of animals to the cold climate ?

- A. Thin layer of body fat
- B. Aestivation
- C. Increased tendency to shiver
- D. Reduced surface area to volumen ratio

Answer: D



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47. Assuming that an animal generates heat at a rate proportional to its volume and can radiate heat at a rate proportional to its body surface

area, which of the following would be best at maintaining its body temperature in a cold climate ?

A. Mouse

B. Rabbit

C. Bear

D. Fox

Answer: C



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48. When organisms change their location to escape from harsh environment, it is called as

A. hibernation

B. vernalisation

C. migration

D. aestivation

Answer: C



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49. Organisms show migration in order to avoid unfavourable conditions of

A. temperature

B. food availability

C. precipitation

D. all of these

Answer: D



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50. Organisms may avoid stressful conditions by suspending their activities for sometime. If they do it to avoid high temperature it is called _____ and if they do it to avoid low temperature then it is called _____

- A. aestivation, migration
- B. migration, hibernation
- C. aestivation, hibernation
- D. hibernation, aestivation

Answer: C



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51. Which of the following is an incorrect match ?

- A. Bacteria - Thick walled resting spores
- B. Bear - Hibernation
- C. Zooplantons - Diapause

Answer: D



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52. Match column I with column II and select the correct option from the given codes.

Column I

Column II

A. Eurythermal (i) Able to tolerate narrow range of temperature

B. Stenothermal (ii) A stage of suspended development

C. Conformers (iii) Body temperature changes with ambient temperature

D. Diapause (iv) Able to tolerate wide range of temperature

A. A – (iv), B – (i), C – (iii), D – (i)

B. A – (iv), B – (i), C – (ii), D – (iii)

C. A – (ii), B – (iv), C – (iii), D – (i)

D. A – (i), B – (ii), C – (iii), D – (iv)

Answer: A



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53. Adaptation may be

- A. behavioural
- B. morphological
- C. physiological
- D. all of these

Answer: D



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54. _____ is an attribute of the organism (morphological, physiological, behavioural) to survive and reproduce in its habitat.

- A. Migration
- B. Hibernation

C. Adaptation

D. Homeostasis

Answer: C



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55. Kangaroo and desert rat that live in conditions of water scarcity are capable of meeting all their water requirements by

A. having a thick coat to minimise evaporative desiccation

B. oxidising stored fat to produce water as by product

C. producing very concentrated urine and solid faeces

D. all of these

Answer: D



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56. Read the following statements about adaptations in desert plants and select the correct ones.

- (i) They have a thick cuticle on their leaf surfaces.
- (ii) They have stomata present in deep sunken pits.
- (iii) They use CAM pathway for photosynthesis.
- (iv) They have flattened stems and large sized leaves.
- (v) Their stomata remain closed during the day.

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

B. (ii),(iii) and (v)

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

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

Answer: D



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57. Opuntia has spine like leaves which help in

- A. reducing the rate of transpiration
- B. increasing the rate of transpiration
- C. increasing the rate of photosynthesis
- D. reducing the rate of photosynthesis

Answer: A



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58. _____rule states that mammals from colder climates generally have shorter ears and limbs to minimise heat loss.

- A. Allen's
- B. Berger's
- C. Borger's
- D. Powell's

Answer: A

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59. An inhabitant of Varanasi goes to Rohtang and experiences nausea, fatigue and heart palpitations. It is because

- A. he is experiencing altitude sickness
- B. his RBC count is lower than required
- C. he is in an area of low atmospheric pressure
- D. all of these

Answer: D

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60. Archaeobacteria that flourish in temperature above 100°C have special_____ molecules that do not coagulate at high temperature and remain functional.

A. carbohydrate

B. ester

C. protein

D. fat

Answer: C



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61. Which of the following problems does the frequent deep sea diver organisms like whales may face ?

A. Compression of tissues surrounding air filled cavities

B. High blood nitrogen levels

C. Lack of oxygen

D. All of these

Answer: D



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

- A. development of thick layer of sub-cutaneous fat
- B. development of extra solute in body fluids
- C. development of ice nucleating protein in extra cellular spaces
- D. both (b) and (c)

Answer: D



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63. Which of the following statements is correct with regard to Bergmann's rule?

- A. Animals of colder area have large size than of hot areas.
- B. Fish of colder area have large size

C. Birds of colder areas have narrow wings

D. Animals of colder areas possess thick fur

Answer: A



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64. Which of the following options exemplifies a behavioural means of homeostasis ?

A. A man sweating profusely in a hot room

B. A rhino covering itself in mud to keep cool

C. A desert lizard basking in Sun to increase its body temperature

D. Both (b) and (c)

Answer: D



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65. A behavioural strategy of adaptation called echolocation is found in

- A. bats
- B. butterfly
- C. praying mantis
- D. arctic tern

Answer: A



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

- A. camouflage
- B. mimicry
- C. warning colouration
- D. both (a) and (b)

Answer: A



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67. Dart frogs (*Phylllobates bicolour*, *Dendrobates pumilo*) found in tropical rain forests of South America are highly poisonous as well as brightly coloured to be easily notice. This is referred to as

- A. camouflage
- B. mimicry
- C. warning colouration
- D. none of these

Answer: C



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68. Match column I with column II and select the correct option from the given codes.

Column I

A. An endothermic animal

B. An ectothermic animal

C. Organism of benthic zone

D. An organism exhibiting camouflage

Column II

(i) Sea anemone

(ii) Man

(iii) Lizard

(iv) Chameleon

A. A – (iv), B – (iii), C – (i), D – (ii)

B. A – (ii), B – (i), C – (iii), D – (iv)

C. A – (ii), B – (iii), C – (i), D – (iv)

D. A – (i), B – (ii), C – (iii), D – (iv)

Answer: C



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

- A. (i) (ii).
distinguished evolution
- B. (i) (ii).
distinguished biogenesis
- C. (i) (ii).
links evolution
- D. (i) (ii).
links biogenesis

Answer: C



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70. In a pond, last year there were 30 lotus plants. Through reproduction, 25 new lotus plants were added in one year while 8 plants died. The birth and death rates for the lotus population respectively are _____ and _____ individuals per lotus per year.

- A. 0.83, 0.26
- B. 0.26, 0.83
- C. 0.25, 0.80
- D. 0.80, 0.25

Answer: A



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71. Parameters related to age structure include

- A. fecundity (birth rate)
- B. generation time
- C. death rate
- D. all of these

Answer: D



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

A. 0.25

B. 200

C. 800

D. 0.2

Answer: A



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73. 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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74. If the age distribution is plotted for a population, the resulting structure is called as

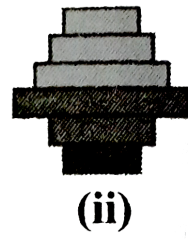
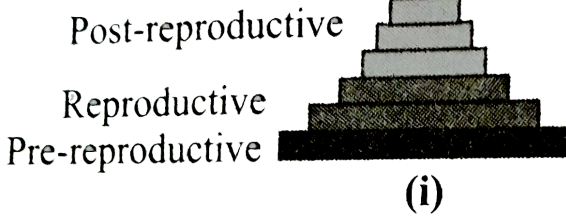
- A. age graph
- B. age curve
- C. age pyramid
- D. age diagram

Answer: C



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75. What does the shape of the given age pyramids reflects about the growth status of the related population ?



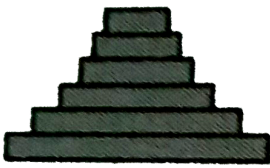
- A. (i) Expanding (ii) Stable
- B. (i) Stable (ii) Declining
- C. (i) Expanding (ii) Declining
- D. (i) Declining (ii) Stable

Answer: C

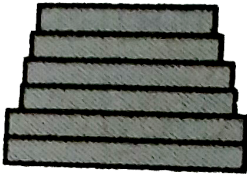


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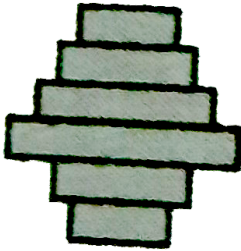
76. A population in which number of pre-reproductive individuals is very large, number of reproductive individuals is moderate while post-reproductive individuals are fewer. Which kind of age pyramid is represented by such a population ?



A.



B.



C.

D. Cannot be determined

Answer: A



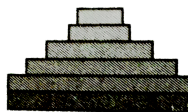
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77. What does the shape of the given age pyramids (A to C) reflect about the growth status of populations ?

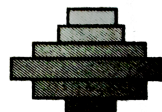
Post-reproductive
Reproductive
Pre-reproductive



A



B



C

- A. (A, B, C, D), (Declining, Stable, Expanding)
- B. (A, B, C, D), (Stable, Expanding, Declining)
- C. (A, B, C, D), (Expanding, Stable, Declining)
- D. (A, B, C, D), (Declining, Expanding, Stable)

Answer: C



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78. The age structures of a population represents

- A. relative number of individuals at each age
- B. number of new borns each year
- C. number of individuals reaching puberty each year
- D. relative number of deaths at each age

Answer: A



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79. The age structures of a population influences population growth because

- A. younger females have more offsprings than do older females
- B. different age groups have different reproductive capabilities
- C. more is the number of immature individuals, slower is the growth of population
- D. a shorter generation time results in slower population growth.

Answer: B



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80. If most individuals in a population are young, why is the population likely to grow rapidly in the future?

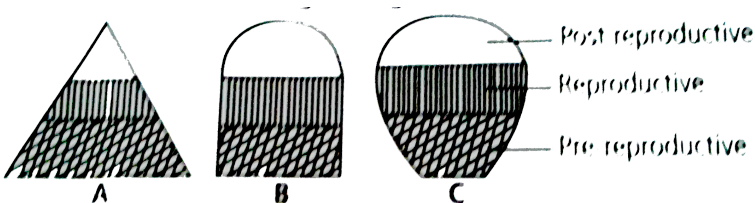
- A. Many individuals will begin to reproduce soon
- B. Death rates will be slow
- C. Immigration and emigration can be ignored
- D. All of these

Answer: A



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81. Study the age pyramids given below and select the correct statements regarding these.



A. A is a triangular age pyramid, where prereproductive stage is very large as compared to the reproductive and post-reproductive stages of the population. This type of age structure indicates that the population would increase rapidly.

B. B is an inverted bell shaped age pyramid, where number of pre-reproductive and reproductive individuals is almost equal. This type of age structure indicates that the population is stable.

C. C is an urn shaped age pyramid, where more number of reproductive individuals are present. This type of age structure indicates that the population is declining.

D. All of these

Answer: D



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82. A population with a larger proportion of older individuals than younger ones will likely to

- A. grow larger and then decline
- B. continue to grow larger indefinitely
- C. decline
- D. not experience a change in population size.

Answer: C



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83. An urn shaped population age pyramid represents

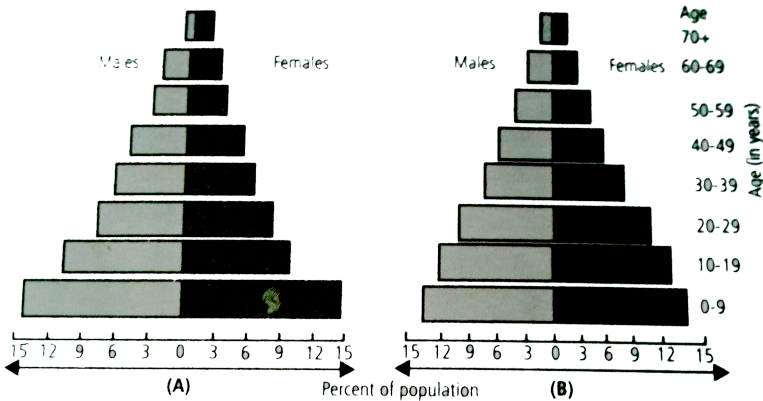
- A. growing population
- B. static population
- C. declining population
- D. extinct population

Answer: C



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84. Given figures represent comparative age-sex pyramids for India for the years 1971 (figure A) and 1991 (figure B), over the 20-year period. Study carefully the pyramids and select the correct statement regarding these.



- A. Pyramid for year 1971 represents a nearly stable population.
- B. pyramid for year 1991 represents a declining population
- C. pyramid for year 1991 has a long way to go before it resembles that of a stable population.

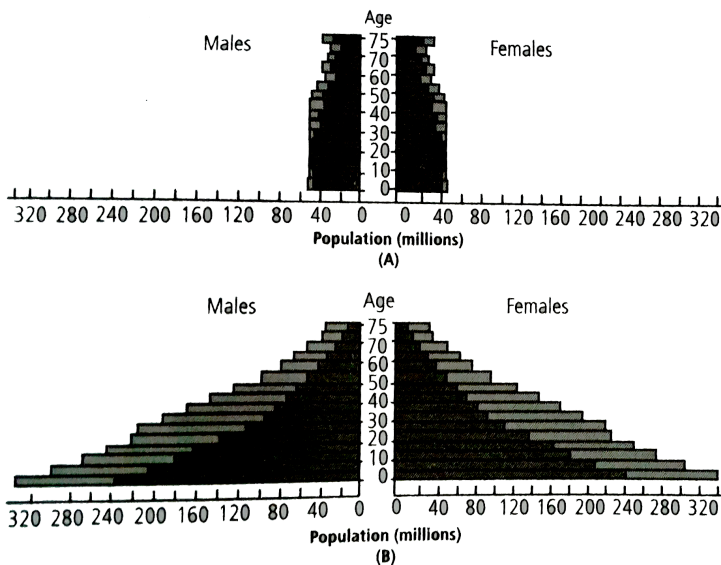
D. All of these

Answer: C



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85. Age-sex sturcture of a population can be depicted in the form of a pyramid by plotting the percentage of population of each sex in each age class. Two age sex pyramids are given here.



Study carefully the above age-sex pyramids and select the correct statements regarding these.

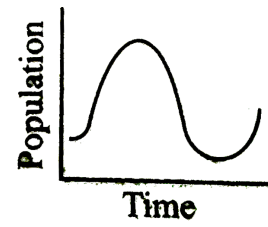
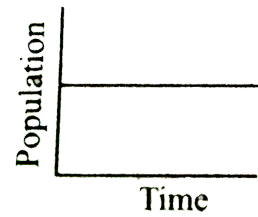
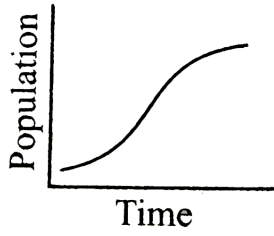
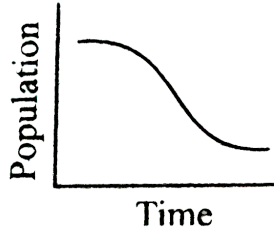
- A. A represents the age-sex pyramid for a developed country and B represents the age-sex pyramid for a developing country.
- B. B is a much less steep pyramid, representing a rapidly growing population, like that of India, as it has a much larger number of young people.
- C. A is a step pyramid, which represents a nearly stable population
- D. All of these

Answer: D



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86. In a given population of 2000 individuals, 80 births and 125 deaths were reported over a given period of time. Which of the following graphs will correspond to it ?



Answer: A



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87. Total number of individuals of a species per unit area and per unit time is called

- A. population size
- B. population density
- C. demography
- D. population dynamics

Answer: B



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88. In some cases, population density is measured in terms of biomass rather than in terms of number because

- A. it is a more meaningful measure when the considered organisms vary greatly in size

- B. it is more convenient when population is huge and counting is impossible or very time consuming
- C. it is a relatively constant measure
- D. both (a) and (b)

Answer: D



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89. Which of the following is not an example of using relative density to measure population density in a certain area ?

- A. Counting pugmarks of tigers to find population density to tigers in a forest.
- B. Counting the number of fishes caught in a trap to find population density of fishes in a lake

C. Measuring biomass of bacterial culture to find out population density of bacteria in a petri dish.

D. Measuring biomass of phytoplanktons in 1 c c water to find out population density of phytoplanktons in a lake.

Answer: C



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90. For which of the following cases, population density can be easily determined by utilising non-biological parameter ?

A. Fish density

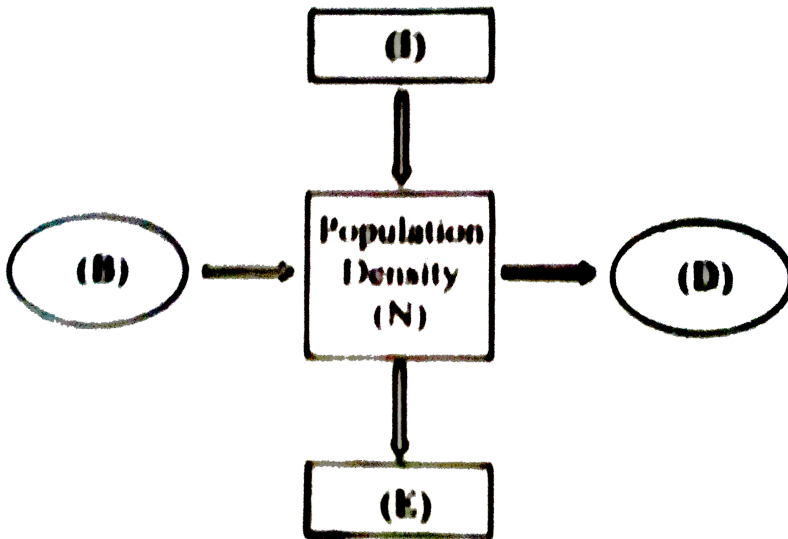
B. Density of bacteria in culture plate

C. siberian of cranes at Bharatpur wetlands

D. Tiger census

Answer: D

91. The given figure represents different factors affecting population density (N). If B = natality D = mortality, E = emigration and I = immigration, then select the incorrect option regarding these.



- A. B and D are most influential factors under normal conditions while I and E become important in special conditions
- B. In a new habitat just being colonised, I become more important than B

C. B and I cause positive changes in N

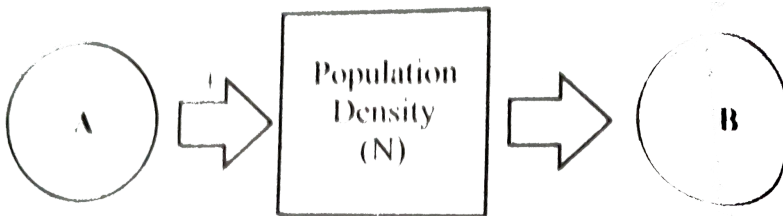
D. I is generally equal to E

Answer: D



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92. The density of a population in a given habit during a given period, fluctuates due to changes in certain basic processes. On this basis, fill up boxes A and B in the given flow chart with correct option.



A. A – Natality, B – Mortality

B. A – Immigration, B – Emigration

C. A – Natality, B – Immigration

D. Both (a) and (b)

Answer: D



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93. Which of the following is not a factor that would limit the growth of a population ?

A. Food shortage

B. Immigration

C. Disease

D. Famine

Answer: B



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94. Following table summarises the differences between natality and mortality. Select the incorrect ones.

Natality

(i) Natality is number of births per unit population per unit time.

(ii) It adds new individuals to the population.

(iii) It increases the size of population.

(iv) It increases population density.

(v) It is low when population size is small and high when population size is large.

A. (i) and (v)

B. (iii) and (iv)

C. (iv) only

D. (v) only

Answer: D



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95. Which of the following factors has a negative effect on the population growth rate ?

A. Emigration

B. Immigration

C. Natality

D. Fecundity

Answer: A



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96. If $N =$ population density at time t , then population density at time $t + 1$ can be written as. $N_{t+1} = N_t + [(A + B) - (C + D)]$. Select the correct option for A, B, C and D in the above equation.

A. A can be mortality and B can be natality

B. B can be immigration and C can be natality

C. C can be mortality and D can be immigration

D. A can be natality and D can be emigration.

Answer: D



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97. Which of the following factors influence population density under normal conditions ?

- A. Deaths
- B. Immigration
- C. Emigration
- D. Both (a) and (c)

Answer: A



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98. Which of the following statements is/are incorrect ?

- A. A population has certain attributes which an individual does not have.

- B. Tiger census in our National parks and tiger reserves is often based on pug marks.
- C. If a new habitat is being colonised birth rate may contribute more significantly to population growth.
- D. Both (a) and (c)

Answer: C



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99. Exponential growth is observed in a population when

- A. resources in the habitat are unlimited
- B. each species has the ability to realise its full innate potential
- C. both (a) and (b)
- D. none of these

Answer: C



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

A. 0.23

B. 0.07

C. 0.05

D. 0.25

Answer: B



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101. The birth and death rates of four countries are given below. Which one will have the least population growth rate ?

Country	Birth rate / 1000	Death rate / 1000
P	15	5
Q	25	10
R	35	18
S	48	41

A. P

B. Q

C. R

D. S

Answer: D



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102. Which of the following equations correctly represents the exponential population growth curve ?

A. $dN / dt = rN$

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

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

D. Both (a) and (c)

Answer: D



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103. 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: D



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

- A. fecundity
- B. surviving ability
- C. carrying capacity
- D. biotic potential

Answer: C



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

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

B.
$$dN/dt = \frac{rN}{K}$$

C.
$$dN/dt = \frac{N(K - N)}{K}$$

D. $dN/dt = \frac{r(K - N)}{K}$

Answer: A



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106. The population growth is generally described by the following equation : $\frac{dN}{dt} = rN\left(\frac{K - N}{K}\right)$ What does 'r' represent in the given equation ?

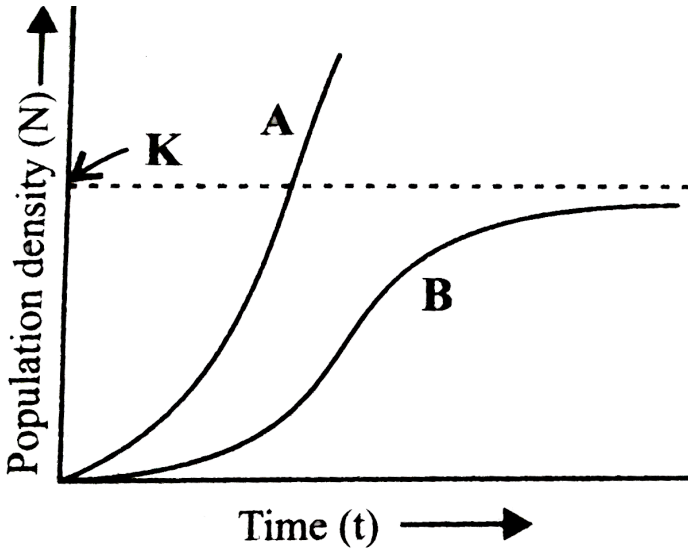
- A. Population density at time 't'
- B. Intrinsic rate of natural increase
- C. Carrying capacity
- D. The base of natural logarithm

Answer: B



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107. Study the population growth curves (*A* and *B*) in the given graph and select the incorrect option.



A. Curve 'A' shows exponential growth, represented by equation

$$\frac{dN}{dt} = rN.$$

B. Curve 'B' shows logistic growth, represented by equation

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

C. Exponential growth curve is considered as more realistic than the logistic growth curve.

D. Curve 'A' can also be represented by equation $N_t = N_0 e^{rt}$.

Answer: C



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108. Which of the following statements is correct ?

- A. The number of organisms always decrease but never increase 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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109. Species interaction with negative influence on both is referred to as

- A. amensalism
- B. mutualism
- C. commensalism
- D. competition

Answer: D



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

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

- (i) (ii) (iii).
- A. Predation Parasitism Amensalism
- (i) (ii) (iii).
- B. Competition Predation Commensalism
- (i) (ii) (iii).
- C. Competition Parasitism Commensalism
- D. Both (b) and (c)

Answer: D



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111. Refer to the given table that summarises the interactions between two organisms (organisms 1 and organism 2). Identify the types of interaction (A,B and C) and select the correct answer.



- (i) *A* can be either predation or parasitism.
- (ii) *B* can be either commensalism or amensalism.
- (iii) *C* can be commensalism.
- (iv) *A* can be amensalism.

A. (i) and (ii)

B. (ii) and (iii)

C. (iii) and (iv)

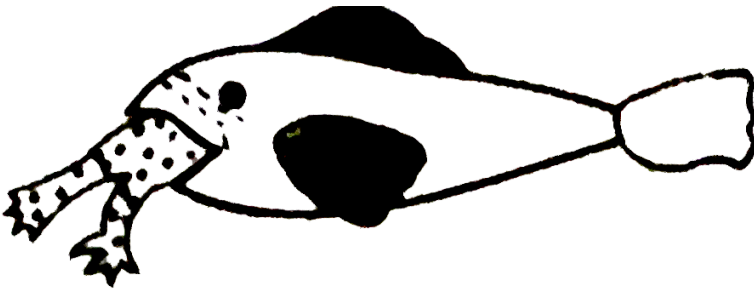
D. (i) and (iii)

Answer: D



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112. Which type of interaction is being shown in the given figure ?



A. Parasitism

B. Commensalism

C. Predation

D. Amensalism

Answer: C



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113. Which of the following is an advantage of predation ?

- A. It serves as conduits for energy transfer across trophic levels.
- B. It keeps population of organisms of lower trophic level under control.
- C. Predators help in maintaining species diversity in a community, by reducing the intensity of competition among competing prey species.
- D. All of these

Answer: D



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

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

Statement 2: When certain exotic species are introduced into a geographical fast because the invaded lands does not have its natural predators.

- A. Both statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct
- D. Both statements 1 and 2 are incorrect

Answer: A



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115. The prickly pear cactus became unusually abundant after its introduction in Australia, because it

- A. had no coevolved herbivores
- B. formed new mycorrhizal association
- C. lost its thorns
- D. all of these

Answer: A



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116. Why you never see cattle or goats browsing on weed Calotropis ?

- A. The plant produces highly poisonous tannins.
- B. The plant produces quinine which is bitter in taste.
- C. The plant produces poisonous cardiac glycosides.
- D. The plant bears prickles.

Answer: C



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117. Which of the following is not an example of prey- predator relationship?

- A. Tiger eating a deer
- B. Plant *Nepenthes* trapping an insect
- C. Bacteria decomposing organic matter
- D. Crocodile killing a man

Answer: C



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118. On the rocky sea coasts of Scotland, the larger and competitively superior barnacle *Balanus* dominates the intertidal area and excludes the

smaller barnacle *Cathamalus* from that zone. Which kind of interaction is being depicted by this example ?

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

Answer: D



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119. Competitive exclusion principle stating that inferior species is eliminated eventually after prolonged competition was given by

- A. Allen
- B. Pearl-Verhulst
- C. Gause

D. Darwin.

Answer: C



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120. Two different species cannot live for long duration in the same niche or habitat. This law is called

- A. Allen's law
- B. Gloger rule
- C. Competitive exclusion principle
- D. Weisman's theory

Answer: C



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

- A. competitive exclusion, Gause
- B. competitive exclusion, MacArthur
- C. resource partitioning, Gause
- D. resource partitioning, MacArthur

Answer: D



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122. When two similar species live in the same area, they may evolve to become more different in order to

- A. drive the other species to extinction
- B. reduce competition

C. use up the other species resources

D. reduce genetic variation

Answer: B



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123. Which of the following statements is/are correct ?

A. Two species may not live in the same habitat.

B. The more dissimilar the niches of two species, the stronger is competition between them

C. No two species can occupy exactly the same niche in the same geographical area.

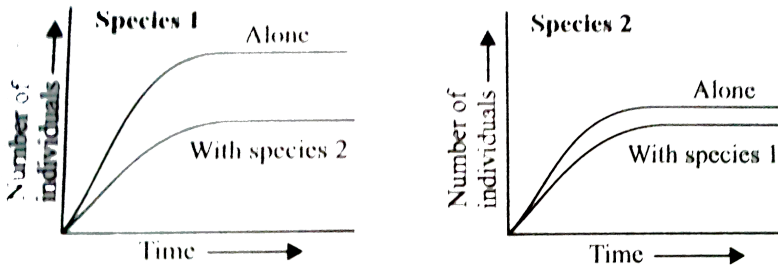
D. All of these

Answer: C



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124. In laboratory experiments, two species of the protist *Paramecium* (species 1 and 2) were grown alone and in the presence of the other species. The following graphs show growth of species 1 and species 2, both alone and when in mixed culture with the other species.



Which of the

following conclusions can be drawn from the graphs ?

- A. Competitive exclusion occurred in these experiments.
- B. Both species are affected by interspecific competition but species 1 is affected less.
- C. Both species are affected by interspecific competition but species 2 is affected less.
- D. Both species are affected equally by interspecific competition.

Answer: C



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

Statement 1: Brood parasitism in birds is an example of parasitism in which the parasitic bird lays its eggs in the nest of its host and the host incubates them.

Statement : During the course of evolution, the eggs of the parasite bird have evolved to resemble the host's eggs in size and colour to reduce the chances of the host bird detecting the foreign eggs and removing them from the nest.

- A. Both statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct
- D. Both statements 1 and 2 are incorrect

Answer: A



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126. Cowbirds lay their eggs in the nests of smaller birds. The fast-developing cowbird chicks hatch first, then push the other baby chicks out of the nest as they hatch. The cowbird is classified as a

- A. pathogen
- B. parasite
- C. mutualist
- D. commensal

Answer: B



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127. Which of the following statements is/are incorrect ?

- (i) The liver fluke, a parasite, depends on intermediate hosts (a snail) to complete its life cycle.
- (ii) The malarial parasite needs a vector (mosquito) to spread to other host organisms.
- (iii) In case of brood parasitism, the eggs of parasitic birds are not detected and removed from the nest because the parasite's eggs resemble the host's eggs in morphology and colour.
- (iv) A population of frogs protected from all predators would increase indefinitely.

A. (i) and (iv)

B. (iii) and (iv)

C. Only (i)

D. None of these

Answer: D



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128. Read the given examples of animal interactions.

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

A. Competition

B. Amensalism

C. Mutualism

D. Commensalism

Answer: D



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129. An interaction between two individuals where one is benefitted while the other is neither benefitted nor harmed is called as

- A. predation
- B. symbiosis
- C. amensalism
- D. Commensalism

Answer: D



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130. Which of the following exhibits mutualism ?

- A. Mycorrhizae living on the roots of higher plants.
- B. Wasps pollinating fig inflorescence.
- C. Sea anemone often found on the shell of hermit crab
- D. All of these

Answer: D



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131. The plant-animal interactions often involve co-evolution of the mutualists so that

- A. the mutually beneficial system could be safeguarded against 'cheaters'
- B. a given plant species can be pollinated only by its partner animal species and no other species
- C. the animal utilises plant not only for ovipositions but also to pollinate the plant
- D. all of these

Answer: D



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

- A. mutualism
- B. co-evolution
- C. commensalism
- D. co-operation.

Answer: B



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

Statement 1 : Plants need the help of insects and animals for pollinating their flowers and dispersing their seeds.

Statement 2: Plants offer rewards in the form of pollen and nectar for pollinators and juicy and nutritious fruits for seed dispersers.

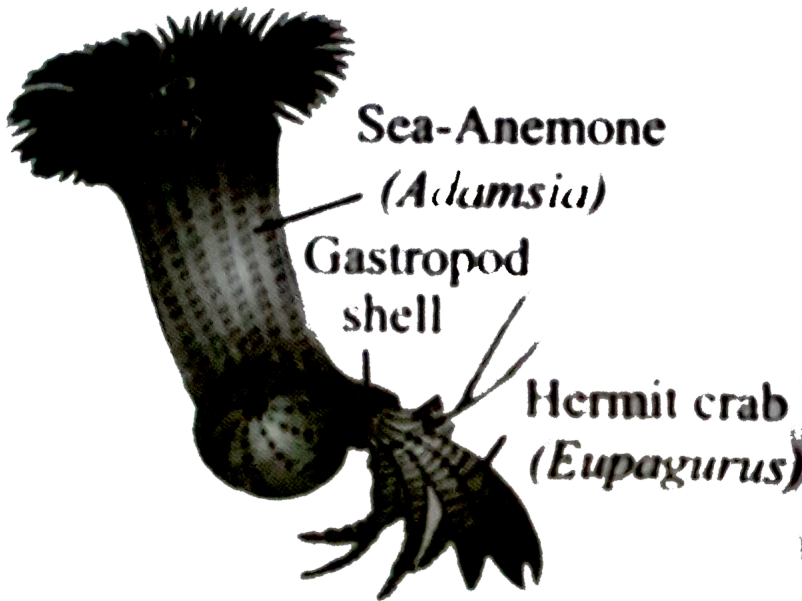
- A. Both statements 1 and 2 are correct
- B. Statement 1 is correct but statement 2 is incorrect
- C. Statement 1 is incorrect but statement 2 is correct
- D. Both statements 1 and 2 are incorrect

Answer: A



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134. Which type of interaction is represented by the given figure ?



- A. Mutualism
- B. Parasitism
- C. Helotism
- D. Amensalism

Answer: A



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135. Match column I with column II and select the correct option from the given codes.

Column I

- A. Ladybird beetles feeding on insects
- B. Barnacles growing on the back of a whale
- C. Wasp pollinating the fig inflorescence
- D. Lice living on skin of humans

Column II

- (i) Mutualism
- (ii) Predation
- (iii) Competition
- (iv) Commensalism
- (v) Parasitism

A. $A - (iii), B - (iv), C - (i), D - (v)$

B. $A - (iv), B - (iii), C - (iv), D - (i)$

C. $A - (ii), B - (i), C - (v), D - (iv)$

D. $A - (iii), B - (ii), C - (i), D - (iv)$

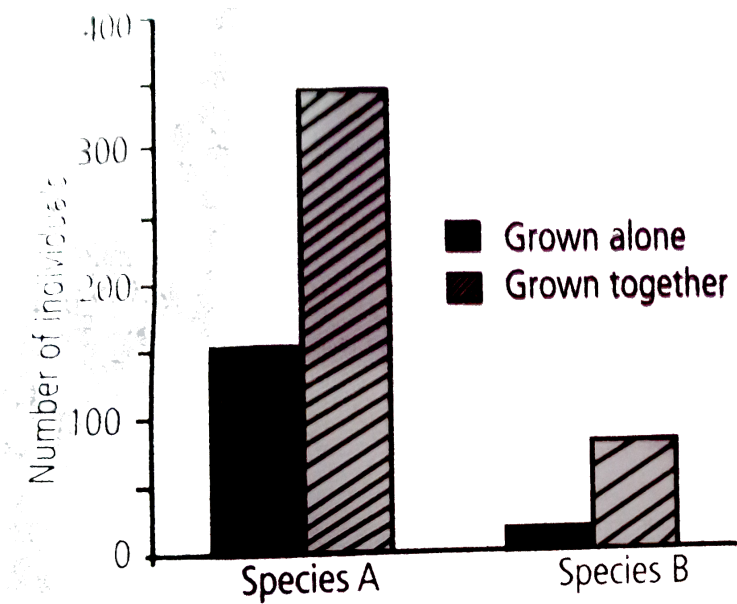
Answer: A



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136. Two insect species were used in a laboratory experiment. For one treatment, both species were grown by themselves (in separate

chambers) on a suitable food source. For the second treatment, the two species were grown together (in the same chamber) on the same type and amount of food as in the first treatment. The given figure shows the results (the number of individuals of each species in the two treatments) at the end of the experiment. Based on these results the two species should be classified as



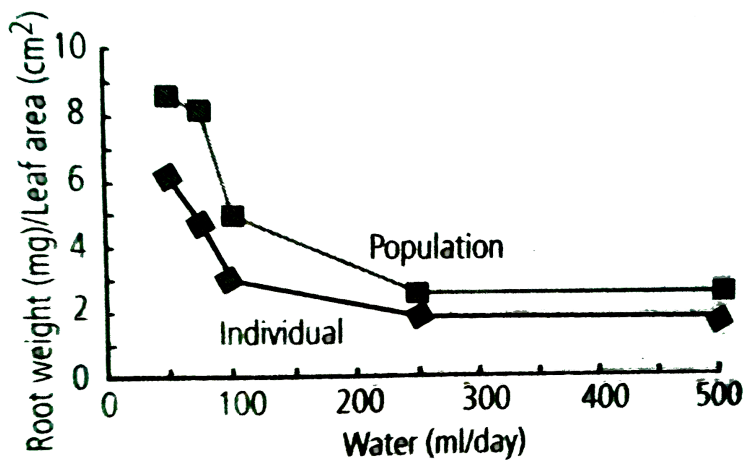
- A. competitors
- B. mutualists
- C. predators of pathogens
- D. commensalists

Answer: B



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



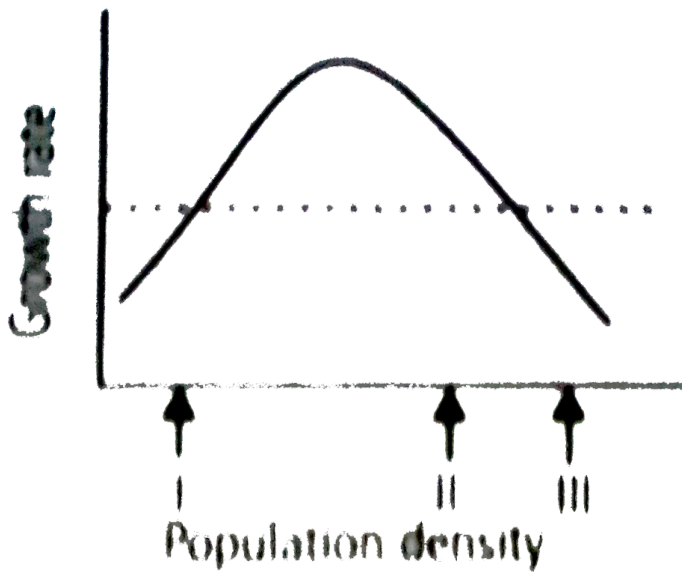
- A. More resources are allocated to the root during low water conditions.
- B. Competition for water among individuals of a population causes more root growth as compared to individuals who are growing alone.
- C. Lesser leaves are formed under low water conditions
- D. Root growth is higher in individuals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

Answer: B

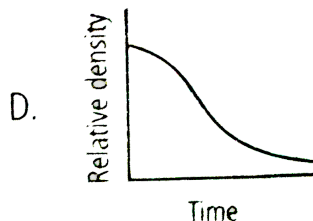
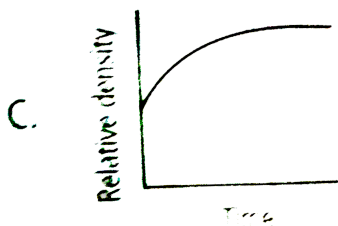
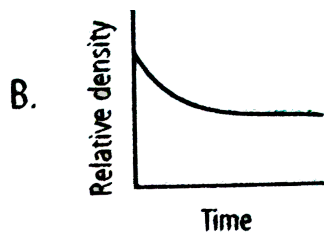
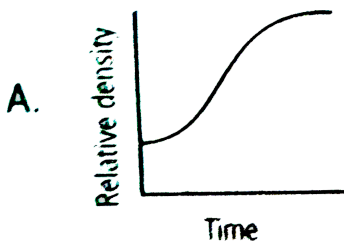


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138. The relationship between population density (N_t) and population growth rate ($R = N_{t+1} - N_t$) in a certain animal species is shown below.



Choose from the following graphs the appropriate populations growth patterns that would be obtained if the population is at the densities (I, II, III) shown in the graph above. [Note : The y-axis in A to D is relative density that cannot be compared to the absolute density in the figure]



A. $I - A, II - B, III - C$

B. $I - D, II - C, III - B$

C. $I - B, II - C, III - D$

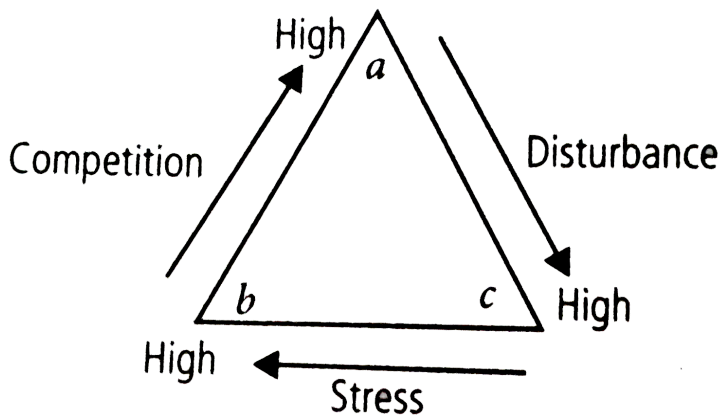
D. $I - C, II - A, III - B$

Answer: B



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139. The figure below depicts life-history strategies for three plant species (a, b and c) along 3 axes : strength of competition with other organisms, level of disturbance in the habitat, and level of environmental stress in the habitat. Species a grows in habitats where competition among species b grown in habitats with and stress are low. Species b grows in habitats with high environmental stress but with low interspecies competition. Species c grows in highly disturbed habitats with low environmental stress.



Which of the

statements below is/are correct ?

- I. Characteristics of "a-type" plants are faster growth rate and short-lived leaves.
- II. Desert annual plants are "b-type" species. they have rapid growth and produce large amount of seeds in a short time after rains.
- III. Most plants belonging to "c-type" species would be herbaceous while "a-type" and "b-types" species are likely to be trees or shrubs.

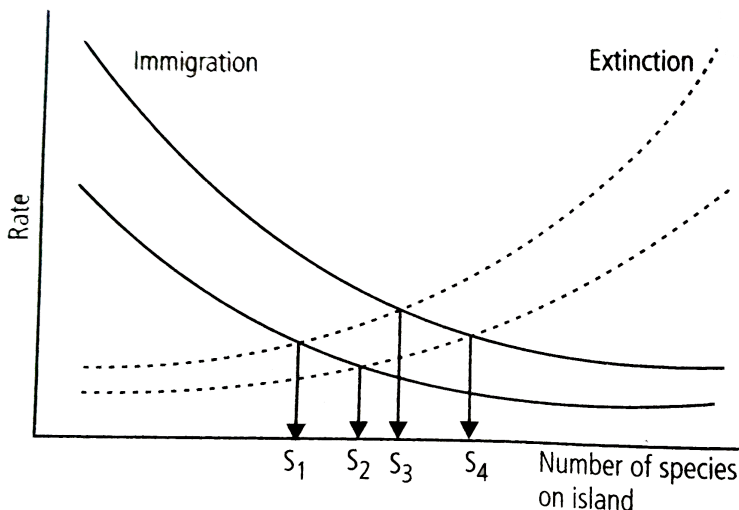
- A. Only II
- B. I and II
- C. I and III
- D. II and III

Answer: D



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140. Island biogeography theory states that the number of species on an island is determined by immigration rates of new species to the island and extinction rates of species on the island. Immigration rates to an island decline as its distance from the mainland increases and extinction rates decrease with increasing island size. When the immigration and extinction rates on an island are equal, the number of species on the island reaches equilibrium.



Which of the following gives the correct combination of distance (near

and far) and area (small and large of islands where species ($S_1 - S_4$) occur ?

- A. S_1 — near island, small island
- B. S_2 — near island, large island
- C. S_3 — small island, far island
- D. S_4 near island, large island

Answer: D



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141. Autecology is the

- A. relation of heterogenous 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: A::B



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142. 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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143. Biosphere is

- A. a component in the ecosystem

B. composed of the plants present in 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



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144. 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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145. 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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146. 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: D



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

A. $18 - 25^{\circ}C$ and $150 - 400cm$

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

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

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

Answer: A



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148. 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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149. What will happen to a wall 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 plant gets more sunlight.

Answer: C



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150. If a population of 50 Paramecium present in a pool increases to 150 after an hour, what would be the 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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151. What would be the per cent growth or birth rate per individual per hour for the same population mentioned in the previous question (Question 10)?

A. 100

B. 200

C. 50

D. 150

Answer: B



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

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

Answer: B



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

- A. Natality > mortality
- B. Immigration > emigration
- C. Mortality and emigration
- D. Natality and immigration

Answer: C



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155. 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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156. 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 is predicted as

A. 25 millions

B. 17 millions

C. 20 millions

D. 18 millions

Answer: B



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157. 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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158. 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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159. Which of the following is a partial root parasite ?

A. Sandal wood

B. Mistletoe

C. Orobanche

D. Ganoderma

Answer: A



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

A. Banana plant

B. Mango

C. Tomato

D. Eucalyptus

Answer: C



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161. Assertion : Prolonged intraspecific competition causes an increases in the size of the niche of a population.

Reason : In such a population, use of a new type of resource will increase through the generations.



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162. Assertion : The community of an ecotone commonly contains the organisms of each of the overlapping communities and in addition the

organisms which are restricted to the ecotone.

Reason : The tendency for increased variety and density at community junctions is known as the edge effect.



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163. Assertion : Stomata generally open in light and close in dark.

Reason : Transpiration is enhanced by heating effect of light.



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164. Assertion : The aquatic organisms in which the osmotic concentration and temperature of body change according to the ambient conditions of water are referred to as conformers.

Reason : Aquatic organisms are able to maintain homeostasis through thermoregulation and osmoregulation by physiological or behavioural means.



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165. Assertion : Small sized animals are rarely found in polar regions.

Reason : Small sized animals have larger surface area relative to their volume and they have to spend much energy to generate body heat through metabolism.



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166. Assertion : At high altitude a person, from plain areas, may experience altitude sickness.

Reason : At high altitude atmospheric pressure is generally high leading to symptoms like nausea, fatigue, etc.



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167. Assertion : Bell shaped age pyramid represents a stable population.

Reason : In a stable population, proportion of individuals in reproductive age group is higher than the individuals in pre-reproductive age group.



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168. Assertion : The rate at which a population can be expected to grow in the future can be assessed graphically by means of a population pyramid.

Reason : A triangular population pyramid is characteristic of a country whose population is stable, neither growing nor shrinking.



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169. Assertion : A population growing in a habitat with limited resources shows initially a lag phase, followed by phase of accelerated and deceleration and finally as asymptote, when the population density reaches the carrying capacity.

Reason : In Verhulst-Pearl Logistic growth, plot of N (population density) at time (t) results in a sigmoid curve.



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170. Assertion : Predators maintain species diversity.

Reason : Predators reduce the intensity of competition among competing prey species.



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

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



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172. Assertion : External parasitism is generally marked by much more extreme specialisation than internal parasitism.

Reason : The structure of an internal parasite is usually very complex possessing suckers, reproductive organs, etc.



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173. Assertion : The epiphytes use the trees only for attachment and manufacture their own food by photosynthesis.

Reason : Commensalism results in negative effects on the growth and survival of one or both of the populations.



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174. Assertion : Mycorrhizae represent a mutually beneficial interspecific interaction of fungi with roots of higher plants.

Reason : In a mutualistic relationship, both the organisms enter into some sort of physiological exchange.



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175. Assertion : Plant-animal interactions do not generally involve co-evolution of the mutualist organisms.

Reason : Evolution of the plants and animals can never go side by side.



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