Q1. Which of the following is a structural feature used to describe a population?

A. Natality
B. Age distribution
C. Emigration
D. Immigration

Answer: B. Age distribution
Explanation: Age distribution is a structural attribute indicating how individuals are distributed among various age groups.

Q2. The intrinsic rate of natural increase (r) for human population is highest in:

A. USA
B. Australia
C. India
D. Rwanda

Answer: D. Rwanda
Explanation: Developing nations like Rwanda typically have a higher intrinsic rate of increase due to high birth rates and lower use of birth control.

Q3. The population size (N) at time t + 1 in logistic growth is given by:

A. Nt = Noe^rt
B. dN/dt = rN
C. dN/dt = rN[(K – N)/K]
D. dN/dt = rN(K + N)/K

Answer: C. dN/dt = rN[(K – N)/K]
Explanation: This is the Verhulst-Pearl logistic growth equation considering carrying capacity (K).

Q4. Identify the correct order for the phases of a sigmoid growth curve:

A. Stationary → Log → Lag → Death
B. Lag → Log → Stationary
C. Lag → Stationary → Log
D. Log → Lag → Stationary

Answer: B. Lag → Log → Stationary
Explanation: Sigmoid growth follows this progression in population growth under limited resources.

Q5. Match the following:

Column I (Term)	Column II (Definition)
A. Natality	1. Number of births per unit time
B. Mortality	2. Number of deaths per unit time
C. Immigration	3. Movement into a population
D. Emigration	4. Movement out of a population

A. A-1, B-2, C-3, D-4
B. A-2, B-1, C-4, D-3
C. A-3, B-2, C-1, D-4
D. A-1, B-4, C-2, D-3

Answer: A. A-1, B-2, C-3, D-4
Explanation: The terms and definitions are directly aligned with population processes.

Q6. A bell-shaped age pyramid indicates:

A. Expanding population
B. Declining population
C. Stable population
D. None of these

Answer: C. Stable population
Explanation: In a bell-shaped pyramid, the birth and death rates are nearly equal, showing stability.

Q7. Which parameter directly affects population density?

A. Natality
B. Immigration
C. Mortality
D. All of the above

Answer: D. All of the above
Explanation: All these demographic factors contribute to changes in population size and density.

Q8. Assertion (A): Logistic growth is more realistic than exponential growth.

Reason (R): In nature, resources are finite.

A. Both A and R are true and R is the correct explanation.
B. Both A and R are true but R is not the correct explanation.
C. A is true, R is false.
D. A is false, R is true.

Answer: A. Both A and R are true and R is the correct explanation.
Explanation: Logistic growth accounts for limited resources, hence more applicable in real ecosystems.

Q9. In a population showing exponential growth, the curve is:

A. S-shaped
B. J-shaped
C. Bell-shaped
D. Horizontal

Answer: B. J-shaped
Explanation: Exponential growth creates a sharp upward curve (J-shape) due to unrestricted resources.

Q10. The carrying capacity (K) of a population is determined by:

A. Birth rate
B. Death rate
C. Resource availability
D. Immigration rate

Answer: C. Resource availability
Explanation: Carrying capacity depends on the amount of resources that the environment can provide.

Q11. Which one of the following is not a characteristic of a population?

A. Natality
B. Mortality
C. Sex ratio
D. Reflex action

Answer: D. Reflex action
Explanation: Reflex action is an individual characteristic, not a population attribute.

Q12. The phenomenon where two species compete for the same resource and one is eliminated is known as:

A. Resource partitioning
B. Competitive release
C. Competitive exclusion
D. Mutualism

Answer: C. Competitive exclusion
Explanation: Gause's Principle states that no two species can coexist indefinitely on the same limiting resource.

Q13. Which of the following is an example of commensalism?

A. Lichen
B. Cattle egret and grazing cattle
C. Tapeworm in intestine
D. Mycorrhiza

Answer: B. Cattle egret and grazing cattle
Explanation: Egret benefits by catching insects stirred up by cattle; cattle are unaffected.

Q14. In parasitism, the parasite:

A. Benefits while the host is unaffected
B. Benefits while the host is harmed
C. Is unaffected
D. Harms the host and itself

Answer: B. Benefits while the host is harmed
Explanation: Classic definition of parasitism.

Q15. Match the following interactions:

Column I (Interaction) Column II (Effect on Species 1 & 2)

A. Mutualism 1. + / +
B. Commensalism 2. + / 0
C. Predation 3. + / –
D. Amensalism 4. – / 0

A. A-1, B-2, C-3, D-4
B. A-2, B-1, C-4, D-3
C. A-3, B-1, C-2, D-4
D. A-1, B-3, C-2, D-4

Answer: A. A-1, B-2, C-3, D-4
Explanation: Interaction types and effects on both species are standard ecology concepts.

Q16. Lichen is an example of:

A. Predation
B. Parasitism
C. Mutualism
D. Commensalism

Answer: C. Mutualism
Explanation: Fungi and algae live together with mutual benefit.

Q17. Which of the following organisms shows brood parasitism?

A. Koel
B. Crow
C. Sparrow
D. Owl

Answer: A. Koel
Explanation: Koel lays its eggs in the crow’s nest; the crow raises the koel's young.

Q18. Population density is most accurately measured by:

A. Number of births per year
B. Number of individuals per unit area
C. Growth rate
D. Age ratio

Answer: B. Number of individuals per unit area
Explanation: Population density = N / Area

Q19. Assertion (A): Camels can tolerate a wide range of body temperatures.

Reason (R): Camels are conformers.

A. Both A and R are true and R is the correct explanation.
B. Both A and R are true but R is not the correct explanation.
C. A is true, R is false.
D. A is false, R is true.

Answer: C. A is true, R is false
Explanation: Camels are regulators, not conformers.

Q20. Which population interaction is harmful to both species?

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

Answer: C. Competition
Explanation: Both species suffer due to resource limitation.

Q21. An example of an ectoparasite is:

A. Liver fluke
B. Head louse

C. Tapeworm
D. Malarial parasite

Answer: B. Head louse
Explanation: It lives on the surface of the host's body.

Q22. Which survivorship curve is typical for humans?

A. Type I
B. Type II
C. Type III
D. Type IV

Answer: A. Type I
Explanation: High survival in early/mid life, drops in old age.

Q23. Which attribute is not helpful to define an ecological niche?

A. Food source
B. Temperature tolerance
C. Number of offspring
D. Habitat

Answer: C. Number of offspring
Explanation: Niche is about functional role and environment, not reproduction alone.

Q24. The functional role of an organism in the ecosystem is called its:

A. Habitat
B. Niche
C. Home range
D. Territory

Answer: B. Niche
Explanation: Niche = role, Habitat = address.

Q25. The maximum population size an ecosystem can support is called:

A. Exponential limit
B. Limiting factor
C. Biotic potential
D. Carrying capacity

Answer: D. Carrying capacity
Explanation: It represents the sustainable population number.

Q26. Which one of the following is a correct example of parasitism?

A. Sea anemone and clown fish
B. Lice on human scalp
C. Orchid growing on mango tree
D. Egret and grazing cattle

Answer: B. Lice on human scalp
Explanation: Lice derive nutrition from the host while harming it – classic parasitism.

Q27. Which of the following is not a population interaction?

A. Commensalism
B. Amensalism
C. Parasitism
D. Mutation

Answer: D. Mutation
Explanation: Mutation is a genetic change, not a biotic interaction between populations.

Q28. In which type of interaction do both species get benefited?

A. Predation
B. Parasitism
C. Mutualism
D. Amensalism

Answer: C. Mutualism
Explanation: Both partners benefit in mutualism.

Q29. Match the following adaptations with their respective organisms:

Column I (Adaptation) Column II (Organism)

A. Thick blubber 1. Polar bear
B. CAM pathway 2. Cactus
C. Diapause 3. Zooplankton
D. Mucous glands 4. Amphibians

A. A-1, B-2, C-3, D-4
B. A-2, B-1, C-4, D-3
C. A-3, B-2, C-1, D-4
D. A-1, B-3, C-2, D-4

Answer: A. A-1, B-2, C-3, D-4
Explanation: All adaptations are matched correctly with respective species.

Q30. Assertion (A): Desert animals excrete concentrated urine.

Reason (R): It helps in water conservation.

A. Both A and R are true and R is the correct explanation.
B. Both A and R are true but R is not the correct explanation.
C. A is true, R is false.
D. A is false, R is true.

Answer: A. Both A and R are true and R is the correct explanation
Explanation: Concentrated urine minimizes water loss.

Q31. Identify the pair of organisms where one is a predator and the other is prey:

A. Tiger and deer
B. Human and tapeworm
C. Lice and human
D. Koel and crow

Answer: A. Tiger and deer
Explanation: The tiger hunts and kills the deer – a predator-prey interaction.

Q32. Which of the following environments is most likely to favor K-selected species?

A. Highly disturbed habitat
B. Unstable environment
C. Temporary pond
D. Stable forest ecosystem

Answer: D. Stable forest ecosystem
Explanation: K-selected species thrive in stable environments with intense competition.

Q33. The J-shaped growth curve is also known as:

A. Logistic growth
B. Sigmoid growth
C. Exponential growth
D. Saturation growth

Answer: C. Exponential growth
Explanation: It shows rapid population increase without limiting factors.

Q34. Which of the following represents zero population growth?

A. Natality = Mortality
B. Natality > Mortality
C. Natality < Mortality
D. Emigration = Immigration

Answer: A. Natality = Mortality
Explanation: Population size remains constant when births equal deaths.

Q35. Which factor does not influence population density?

A. Natality
B. Immigration

C. Habitat size
D. Gestation period

Answer: D. Gestation period
Explanation: While it affects reproduction rate, it doesn't directly affect population density.

Q36. The zone of tolerance refers to:

A. Area with maximum pollution
B. Optimum range of temperature
C. The entire range of environmental factor that an organism can survive in
D. The range in which reproduction ceases

Answer: C. The entire range of environmental factor that an organism can survive in
Explanation: Includes optimum and stress zones.

Q37. Identify the incorrect pair:

A. Prickles – Opuntia
B. Pneumatophores – Avicennia
C. Thick cuticle – Hydrilla
D. Blubber – Whale

Answer: C. Thick cuticle – Hydrilla
Explanation: Hydrilla is a hydrophyte; no need for thick cuticle.

Q38. Which population interaction is used in biocontrol?

A. Mutualism
B. Parasitism
C. Predation
D. Amensalism

Answer: C. Predation
Explanation: Natural predators are introduced to control pest populations.

Q39. What kind of growth pattern is shown in logistic growth?

A. J-shaped
B. U-shaped
C. S-shaped
D. Bell-shaped

Answer: C. S-shaped
Explanation: It accounts for carrying capacity, showing lag, log, and stationary phases.

Q40. Assertion (A): Some animals undergo hibernation in winter.

Reason (R): Hibernation is a behavioral adaptation to avoid stressful conditions.

A. Both A and R are true and R is the correct explanation.
B. Both A and R are true but R is not the correct explanation.
C. A is true, R is false.
D. A is false, R is true.

Answer: A. Both A and R are true and R is the correct explanation
Explanation: Hibernation is a strategy for surviving extreme cold.

Q41. The carrying capacity of a population refers to:

A. Maximum reproductive capacity
B. Minimum survival level
C. Maximum number of individuals that environment can support
D. Ratio of birth rate and death rate

Answer: C. Maximum number of individuals that environment can support
Explanation: It defines population sustainability.

Q42. Which of the following interactions is seen in mycorrhiza?

A. Parasitism
B. Mutualism
C. Commensalism
D. Predation

Answer: B. Mutualism
Explanation: Both fungus and plant roots benefit.

Q43. The phenomenon where a harmless species mimics a harmful one is:

A. Camouflage
B. Mimicry
C. Adaptation
D. Mutualism

Answer: B. Mimicry
Explanation: Mimicry is a survival adaptation.

Q44. In which of the following organisms do we observe estivation?

A. Earthworm
B. Crocodile
C. Polar bear
D. Lizard

Answer: B. Crocodile
Explanation: Estivation helps animals escape summer heat.

Q45. Which is a correct example of facultative mutualism?

A. Cattle egret and cattle
B. Fig and wasp
C. Lichen
D. Orchid on mango tree

Answer: B. Fig and wasp
Explanation: Though both benefit, they can survive independently in some cases.