

Ecology and Evolution - Review Exam 4

Exam 3 will cover chapters 10 , 11 & 12 and all notes since the last exam. Please review the notes and read the book.

1. In the equation $N_t = N_0 e^{rt}$ what is "N₀"
 - A. A constant equal to the base of the natural logarithms, approximately 2.618
 - B. The per capita growth rate of the population (number of new individuals per old individual per unit time)
 - C. The initial population size
 - D. The final population size
 - E. The amount of time that has passed.
2. What does the exponential growth equation assume about the affect of population density on the per capita growth rate of the population?
 - A. it assumes the growth rate declines as the population density increases.
 - B. it assumes the growth rate increases as the population density increases.
 - C. it assumes that population density remains constant.
 - D. it assumes the population density has no effects of the growth rate.
 - E. it assumes that because of the Allee effect increased population density will increase the growth rate until the law of limiting returns kicks in.
3. What is the definition of ecology used in this class?
 - A. Ecology is the study of where we live.
 - B. Ecology is the practice of striving to live in such a way as to be in harmonic congruence with the global spirit.
 - C. Ecology is the study of living organisms
 - D. Ecology is the scientific study of the natural world independent of the effects of man.
 - E. Ecology is the scientific study of the processes influencing the distribution and abundance of organisms, the interactions among organisms, and the interactions between organisms and the transformation and flux of energy and matter.
4. What does the logistic growth equation assume about the affect of population density on the per capita growth rate of the population?
 - A. it assumes the growth rate declines as the population density increases.
 - B. it assumes the growth rate increases as the population density increases.
 - C. it assumes that population density remains constant.
 - D. it assumes the population density has no effects of the growth rate.
 - E. it assumes that because of the Allee effect increased population density will increase the growth rate until the law of limiting returns kicks in.
5. What is a metapopulation
 - A. A population of populations
 - B. A very small population
 - C. A very large population
 - D. A population that is not reproductively isolated.
6. For a human population to continue to grow at exponential or faster rates which of the following must happen?
 - A. Food supplies must continue to grow at exponential or faster rates
 - B. Food supplies can not decline because we have exhausted our energy supplies
 - C. We must continually find new and better way to use limited resources
 - D. Population density must continue to increase
 - E. All of above
7. Two species interact and it benefits species A and harms species B, which of the following best describes the interaction?
 - A. Commensalism
 - B. Predation.
 - C. Mutualism
 - D. Mullerian Mimicry
 - E. Competition
8. Which of the following is the best description of the logistic growth equation?
 - A. A modification of the exponential equation that takes into account the idea that at high population densities birth rate are likely to decline and death rates are likely to increase.

- B. A modification of the exponential equation that takes into account the idea that at high population densities birth rates are likely to increase and death rates are likely to decrease.
- C. A more advanced version of the exponential growth equation that takes into account the ability of "interest" to compound instantly.
- D. Both A & B.
- E. A model that takes into account the effects of predation on population growth.

9. What is commensalism?

- A. A symbiosis where two species negatively affect each other.
- B. A symbiosis where a predator partially consumes a prey.
- C. A symbiosis where two species consume the same resources and defend the same territory.
- D. A symbiosis where two species interact with one species benefiting and the other species is unaffected by the interaction.
- E. A symbiosis that occurs between three or more species.

10. What does the intermediate disturbance hypothesis predict?

- A. Succession will occur after small disturbance.
- B. Communities that are disturbed the most have the lowest diversity.
- C. Communities that are disturbed the least have the lowest diversity.
- D. Communities with intermediate levels of disturbance will have the lowest diversity.
- E. Communities with intermediate levels of disturbance will have the highest diversity.

11. If a population is growing in a manner predictable by the exponential growth equation and the population size grew from 10,000 to 20,000 in two years, how long will it take for the population to grow from 20,000 to 40,000?

- A. insufficient information is provided to make the calculation
- B. 0.5 years
- C. 1 year
- D. 2 years
- E. 4 years

12. What does "per capita" mean?

- A. per dollar rate.
- B. the maximum rate
- C. the minimum rate
- D. the rate per individual in the population.
- E. An absolute irreversible change.

13. In the logistic growth equation what does " dN/dt " mean?

- A. The change in K.
- B. The change in population size per unit time
- C. The change in carrying capacity,
- D. The change in the intrinsic growth rate.
- E. The change in time per individual.

14. Approximately how many years did it take for the human population to double from 3 billion people to 6 billion people?

- A. 5 years
- B. 50 Years
- C. 500 Years
- D. 5000 years
- E. 50000 years

15. It is often said that the human population is growing hyper-exponentially, what does "hyper-exponentially" mean?

- A. That the time it takes for the population to double is becoming shorter.
- B. That the time it takes for the population to double is becoming longer.
- C. That death rates are lower than birth rates.
- D. That birth rates are lower than death rates
- E. That the population is approaching K and growth rates are declining.

16. A graph of the age distribution of people in a country is shaped like a column with the base and the top being the same width. What does this indicate about the population growth of the country?

- A. nothing
- B. The population is steady and not growing
- C. the population is shrinking
- D. The population is at carrying capacity
- E. The population is growing very quickly.

17. Approximately how much will the human population grow during a 50 minute lecture?

- A. 6 people
- B. 60 people
- C. 600 people
- D. 6000 people
- E. 60000 people

18. What is the "Allee" effect?

- A. The tendency for some populations to grow faster at high population densities
- B. The tendency for most populations to grow slower at high population densities

- C. The tendency for population to growth rates to be density dependent.
- D. The tendency for most bisexual population to have approximately equal numbers of males and females.
- E. The tendency for the side of the house opposite the direction of the wind to be warmer.

19. Approximately what is the current size of the human population?

- A. 650,000,000,000
- B. 65,000,000,000
- C. 6,500,000,000
- D. 650,000,000
- E. 65,000,000

20. What does "K" represent in the logistic growth equation?

- A. the Allee effect
- B. The maximum intrinsic per capita growth rate.
- C. Carrying capacity
- D. The initial population size
- E. The final population size

21. Termites and the bacteria that live in their guts are an example of ...?

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

22. If a niche is an "nth dimensional hypervolume ..." what are the dimensions?

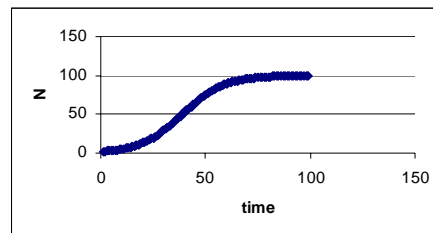
- A. the number of individuals in the population
- B. the allee effect
- C. Gradients of resources or environmental conditions which affect the distribution of the species.
- D. Length, Width and Height.
- E. Symbiosis

23. When *Paramecium aurelia* and *Paramecium caudatum* are grown in the same petri dish fewer individual of each species will be found than if they were grown in separate Petri dish of the same size. What is this an example of?

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

24 The population illustrated by curve to the right would best be described as?

- A. growing logistically
- B. growing exponentially
- C. unstable
- D. experiencing competitive exclusion
- E. In stasis



25. Which of the following best describes the relationship between human population size and energy use by humans?

- A. Human population size and energy consumption are increasing at the same rate.
- B. Human population size is increasing faster than energy consumption
- C. Energy consumption is increasing faster than human population size.
- D. all of above
- E. There is no relationship between human energy consumption and population size.

26. Which of the following best describes the scientific consensus of the carrying capacity of the globe for humans.

- A. K is about 12 billion
- B. we have already exceeded K
- C. K is about 3 Billion
- D. K is about 120 billion
- E. There is no consensus.

27. What are the units of "r" in the exponential growth equation?

- A. r is unitless
- B. number of new individuals per old individual per unit time
- C. number of new individuals per old individual
- D. number of new individuals per unit time
- E. mass/velocity

28. Which of the following is an assumption of the logistic growth model but not of the exponential growth model?

- A. constant r
- B. No genetic structure
- C. Density dependence
- D. differential survival of young and old members of the population
- E. All of above

29. Passenger pigeon are thought to have required large noisy breeding colonies to successfully reproduce. What is this an example of?

- A. the allee effect
- B. density independence
- C. Logistic population growth
- D. Competitive exclusion
- E. Niche shift.

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30. For a human population to continue to grow at exponential or faster rates which of the following must happen?
- A. Food supplies must continue to grow at exponential or faster rates
 - B. Food supplies can not decline because we have exhausted our energy supplies
 - C. We must continually find new and better way to use limited resources
 - D. Population density must continue to increase
 - E. All of above
31. Increasing the size of the predator population will have what effect of the growth rate of prey population?
- A. none
 - B. cause faster population growth,
 - C Cause slower population growth
- 32 . Increasing the size of the prey population will have what effect of the growth rate of predator population?
33. What uis scramble competition?
34. How is intraspecific competition different than interspecific competition
35. What is the Competitive Exclusion Principle
36. What is the difference between a fundamental and a realized niche?
- 37 what is an Nth dimensional hyper volume?