|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  | | --- | --- | | Question 1 of 35 | 0.0 Points |   The Earth is tilted 23.4 degrees from vertical. If the tilt were instead 45 degrees, how would that likely change Earth's climate?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. The poles would experience more extreme temperatures summer and winter. |  | |  | |  | | --- | |  | | B. The equator would become cooler. |  | |  | |  | | --- | |  | | C. The equator would become warmer. |  | | orrect | |  | | --- | |  | | D. A and B |  | |  | |  | | --- | |  | | E. A and C |  |  |  | | --- | | Answer Key: D | |  | |
| |  |  | | --- | --- | | Question 2 of 35 | 0.0 Points |   Use the biome diagram to answer the following. Note the location and direction of each axis. Current climate change predications indicate that the average temperature will rise by 4 degrees C in the next 100 years. If you place a data tracking device in tundra and leave it for 100 years, when your successor returns after a century has passed, what biome will the data tracker most probably be in then?   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Desert |  | |  | |  | | --- | |  | | B. Ocean |  | | orrect | |  | | --- | |  | | C. Taiga |  | |  | |  | | --- | |  | | D. Temperate rain forest |  | |  | |  | | --- | |  | | E. Tropical rain forest |  |  |  | | --- | | Answer Key: C | |  | |
| |  |  | | --- | --- | | Question 3 of 35 | 0.0 Points |   Crickets on Kauai chirp with their wings, but a subset are mutants that cannot call. Chirping crickets are more successful at attracting mates but also at attracting parasites. The ultimate cause for why the silent mutant crickets do not call is because they do not have wings.   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. lack the toothy vein that creates the chirp sound. |  | | orrect | |  | | --- | |  | | B. avoid parasitism. |  | |  | |  | | --- | |  | | C. do not have a “scraper” to scrape across the teeth on their wing. |  | |  | |  | | --- | |  | | D. can still mate effectively because females are not choosy. |  |  |  | | --- | | Answer Key: B | |  | |
| |  |  | | --- | --- | | Question 4 of 35 | 0.0 Points |   A population is correctly defined as having which of the following characteristics?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. inhabiting the same general area |  | |  | |  | | --- | |  | | B. belonging to the same species |  | | ncorrect | |  | | --- | |  | | C. having an even distribution throughout the range |  | |  | |  | | --- | |  | | D. All of these. |  | |  | |  | | --- | |  | | E. A and B. |  |  |  | | --- | | Answer Key: E | |  | |
| |  |  | | --- | --- | | Question 5 of 35 | 0.0 Points |   Which of these female Mandarte sparrows has greater inclusive fitness?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Focal female lays 10 eggs, 4 of which survive to adulthood, while her sister has 5 eggs that all survive to adulthood |  | |  | |  | | --- | |  | | B. Focal female has no siblings, lives for 3 years, and each year produces 2 offspring that survive to adulthood. |  | | orrect | |  | | --- | |  | | C. Focal female dies before reproducing, while her sisters have 15 eggs between them that all survive to adulthood. |  | |  | |  | | --- | |  | | D. A, B and C all have equivalent fitness. |  | |  | |  | | --- | |  | | E. A and B. |  |  |  | | --- | | Answer Key: C | |  | |
| |  |  | | --- | --- | | Question 6 of 35 | 0.0 Points |   Population growth rates for discrete population growth (lambda), exponential or logistic growth (r), and estimates from life tables (R0) all indicate a shrinking population if they are less than   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. 1 |  | |  | |  | | --- | |  | | B. 0 |  | |  | |  | | --- | |  | | C. 1, 1, 0 respectively |  | | orrect | |  | | --- | |  | | D. 1, 0, 1 respectively |  | |  | |  | | --- | |  | | E. 0, 1, 1 respectively |  |  |  | | --- | | Answer Key: D | |  | |
| |  |  | | --- | --- | | Question 7 of 35 | 0.0 Points |   As N approaches K for a population growing according the logistic equation, the   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. growth of the population will not change. |  | |  | |  | | --- | |  | | B. growth of the population will approach zero. |  | |  | |  | | --- | |  | | C. population size will increase exponentially. |  | |  | |  | | --- | |  | | D. population size will increase to carrying capacity. |  | | orrect | |  | | --- | |  | | E. B and D. |  |  |  | | --- | | Answer Key: E | |  | |
| |  |  | | --- | --- | | Question 8 of 35 | 0.0 Points |   Kermits have two life stages: juvenile and adult. Based on the life table below, this Kermit population is   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | orrect | |  | | --- | |  | | A. Increasing |  | |  | |  | | --- | |  | | B. Decreasing |  | |  | |  | | --- | |  | | C. Staying the same |  | |  | |  | | --- | |  | | D. There is not enough information. |  |  |  | | --- | | Answer Key: A | |  | |
| |  |  | | --- | --- | | Question 9 of 35 | 0.0 Points |   As you study two closely related predatory insect species, the two-spot and the three-spot avenger beetles, you observe that each species hunts at dawn in the absence of the other species. However, where their ranges overlap, the two-spot avenger beetle hunts at night and the three-spot hunts in the morning. When you bring them into the laboratory and isolate the two different species, you discover that the offspring of each species are active in the morning. You have discovered an example of   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. mutualism |  | |  | |  | | --- | |  | | B. character displacement |  | |  | |  | | --- | |  | | C. mimicry |  | |  | |  | | --- | |  | | D. intraspecific competition |  | | orrect | |  | | --- | |  | | E. resource partitioning |  |  |  | | --- | | Answer Key: E | |  | |
| |  |  | | --- | --- | | Question 10 of 35 | 0.0 Points |   In the avenger beetle example, the beetles’ life history traits are the   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. timing of when they hunt |  | |  | |  | | --- | |  | | B. biome the species live in |  | |  | |  | | --- | |  | | C. predatory behaviors |  | | orrect | |  | | --- | |  | | D. number of eggs they lay |  | |  | |  | | --- | |  | | E. all of these are life history traits |  |  |  | | --- | | Answer Key: D | |  | |
| |  |  | | --- | --- | | Question 11 of 35 | 0.0 Points |   The figure shows realized (dashed) and fundamental niches (solid). Which species is more successful in competing for seeds?   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | orrect | |  | | --- | |  | | A. species 2 |  | |  | |  | | --- | |  | | B. species 1 |  | |  | |  | | --- | |  | | C. This figure does not illustrate which species is more successful. |  | |  | |  | | --- | |  | | D. These species do not compete for seeds. |  |  |  | | --- | | Answer Key: A | |  | |
| |  |  | | --- | --- | | Question 12 of 35 | 0.0 Points |   Which interaction reduces fitness for both species involved?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. commensalism |  | | orrect | |  | | --- | |  | | B. competition |  | |  | |  | | --- | |  | | C. enemy-victim |  | |  | |  | | --- | |  | | D. mutualism |  | |  | |  | | --- | |  | | E. No interaction reduces fitness for both players. |  |  |  | | --- | | Answer Key: B | |  | |
| |  |  | | --- | --- | | Question 13 of 35 | 0.0 Points |   Which statement best describes the evolutionary significance of mutualism?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Mutualism generates more biodiversity in a community. |  | |  | |  | | --- | |  | | B. Individuals in a mutualistic relationship are less resistant to parasites. |  | | orrect | |  | | --- | |  | | C. The interaction increases the survival and/or population growth rate(s) of mutualistic species. |  | |  | |  | | --- | |  | | D. Mutualistic interaction lessens competition in communities where it is present. |  | |  | |  | | --- | |  | | E. Mutualistic relationships allow organisms to synthesize and use energy more efficiently. |  |  |  | | --- | | Answer Key: C | |  | |
| |  |  | | --- | --- | | Question 14 of 35 | 0.0 Points |   In the lynx hare interaction, the lynx   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Increase the number of hare born |  | |  | |  | | --- | |  | | B. Decrease the number of hare born |  | |  | |  | | --- | |  | | C. Increase the number of hare dying |  | |  | |  | | --- | |  | | D. A and C. |  | | orrect | |  | | --- | |  | | E. B and C. |  |  |  | | --- | | Answer Key: E | |  | |
| |  |  | | --- | --- | | Question 15 of 35 | 0.0 Points |   Which of the following is a correct statement about the Island Biogeography Model?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. The more species that inhabit an island, the lower the extinction rate. |  | |  | |  | | --- | |  | | B. As the number of species on an island increases, the emigration rate decreases. |  | |  | |  | | --- | |  | | C. Competitive exclusion is less likely on an island that has large numbers of species. |  | | orrect | |  | | --- | |  | | D. Small islands receive few new immigrant species. |  | |  | |  | | --- | |  | | E. Islands closer to the mainland have higher extinction rates. |  |  |  | | --- | | Answer Key: D | |  | |
| |  |  | | --- | --- | | Question 16 of 35 | 0.0 Points |   A tide pool contained 15 species of invertebrates. A researcher experimentally removed all individuals of one species, leaving 14 species behind. She monitored the tide pool for 2 months, and recorded the subsequent loss of 8 species over two months. The species she removed was likely a(n) \_\_\_\_\_.   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. top competitor |  | | orrect | |  | | --- | |  | | B. keystone species |  | |  | |  | | --- | |  | | C. herbivore |  | |  | |  | | --- | |  | | D. primary consumer |  | |  | |  | | --- | |  | | E. primary producer |  |  |  | | --- | | Answer Key: B | |  | |
| |  |  | | --- | --- | | Question 17 of 35 | 0.0 Points |   Moisture is moved by Hadley Cell below   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. As a cycle following the flow of the arrows |  | |  | |  | | --- | |  | | B. As a cycle opposite the flow of the arrows |  | | orrect | |  | | --- | |  | | C. From Point 1 to point 2 back to point 1 |  | |  | |  | | --- | |  | | D. From Point 1 to point 2 to point 3 |  | |  | |  | | --- | |  | | E. From Point 2 to point 3 |  |  |  | | --- | | Answer Key: C | |  | |
| |  |  | | --- | --- | | Question 18 of 35 | 0.0 Points |   Refer to the food web below to answer the following questions. Who is the primary producer?   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Sparrowhawk |  | |  | |  | | --- | |  | | B. Blue tit |  | |  | |  | | --- | |  | | C. Other insects |  | | orrect | |  | | --- | |  | | D. Tree |  | |  | |  | | --- | |  | | E. Pigeon |  |  |  | | --- | | Answer Key: D | |  | |
| |  |  | | --- | --- | | Question 19 of 35 | 0.0 Points |   Which of the following is a food chain (from prey to predator) from this food web?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Tree – pigeon – sparrowhawk – great spotted woodpecker |  | |  | |  | | --- | |  | | B. Other insects – greater spotter woodpecker – blue tit |  | |  | |  | | --- | |  | | C. Sparrowhawk – blue tit – parasitic wasp |  | | orrect | |  | | --- | |  | | D. Tree leaf miner – parasitic wasps – blue tit - sparrowhawk |  |  |  | | --- | | Answer Key: D | |  | |
| |  |  | | --- | --- | | Question 20 of 35 | 0.0 Points |   The carbon cycle contains sources and sinks, or places where carbon resides for a while out of circulation. Which organism from this food web is most likely to be a carbon sink?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Birds |  | |  | |  | | --- | |  | | B. Insects |  | | orrect | |  | | --- | |  | | C. Tree |  | |  | |  | | --- | |  | | D. They all contain carbon, so any of these is an equally likely carbon sink. |  | |  | |  | | --- | |  | | E. A and B. |  |  |  | | --- | | Answer Key: C | |  | |
| |  |  | | --- | --- | | Question 21 of 35 | 0.0 Points |   If the number of sparrowhawks increases 10X, then you would predict   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. An increase in “other insects” |  | | ncorrect | |  | | --- | |  | | B. A decrease in “other insects” |  | |  | |  | | --- | |  | | C. No change in “other insects” |  | |  | |  | | --- | |  | | D. A or B. |  |  |  | | --- | | Answer Key: A | |  | |
| |  |  | | --- | --- | | Question 22 of 35 | 0.0 Points |   When a lynx eats a hare, which of these is NOT true? The matter from the hare   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | orrect | |  | | --- | |  | | A. Is instantly converted into lynx matter. |  | |  | |  | | --- | |  | | B. Is lost from the lynx after digestion (as feces). |  | |  | |  | | --- | |  | | C. Is used to build new lynx biomass through a series of chemical reactions |  | |  | |  | | --- | |  | | D. Is used to maintain the existing lynx biomass |  | |  | |  | | --- | |  | | E. A and B. |  |  |  | | --- | | Answer Key: A | |  | |
| |  |  | | --- | --- | | Question 23 of 35 | 0.0 Points |   According to Hamilton’s rule (rB > C), altruistic behaviors can be maintained in a population when   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. The altruist and recipient are first cousins |  | |  | |  | | --- | |  | | B. The costs of an altruistic act are balanced by how many genes the altruist and recipient share |  | |  | |  | | --- | |  | | C. The costs of altruistic act with a stranger are balanced by benefits incurred |  | | orrect | |  | | --- | |  | | D. Relatedness combined with an increase in fitness more than balance the fitness costs to the altruist |  | |  | |  | | --- | |  | | E. None of these. |  |  |  | | --- | | Answer Key: D | |  | |
| |  |  | | --- | --- | | Question 24 of 35 | 0.0 Points |   The difference between global NPP and GPP is   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Productivity by terrestrial versus aquatic ecosystems |  | |  | |  | | --- | |  | | B. Respiration by primary producers |  | | orrect | |  | | --- | |  | | C. Oxidation-reduction reactions by autotrophs |  | |  | |  | | --- | |  | | D. Atmospheric oxygen production |  |  |  | | --- | | Answer Key: B, C | |  | |
| |  |  | | --- | --- | | Question 25 of 35 | 0.0 Points |   Webster (1994) discovered that rats infected with Toxoplasma gondii no longer fear the smell of cats. Cats are the final host for T. gondii. This is an example of a parasite altering host behavior to   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | orrect | |  | | --- | |  | | A. increase parasite fitness. |  | |  | |  | | --- | |  | | B. Increase cat host fitness |  | |  | |  | | --- | |  | | C. Increase rat host fitness |  | |  | |  | | --- | |  | | D. All of these. |  | |  | |  | | --- | |  | | E. A and C. |  |  |  | | --- | | Answer Key: A | |  | |
| |  |  | | --- | --- | | Question 26 of 35 | 0.0 Points |   If a bacterial cell responds to a build-up of a chemical in the liquid it lives in, that’s an example of   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | orrect | |  | | --- | |  | | A. Behavior |  | |  | |  | | --- | |  | | B. Ultimate cause |  | |  | |  | | --- | |  | | C. Exponential population growth |  | |  | |  | | --- | |  | | D. Mutualism |  | |  | |  | | --- | |  | | E. Interspecific competition |  |  |  | | --- | | Answer Key: A | |  | |
| |  |  | | --- | --- | | Question 27 of 35 | 0.0 Points |   Which of these terms indicates organisms that capture light energy and convert it to chemical bonds as organic carbon?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | orrect | |  | | --- | |  | | A. Primary producers |  | |  | |  | | --- | |  | | B. Secondary producers |  | |  | |  | | --- | |  | | C. Primary consumers |  | |  | |  | | --- | |  | | D. Secondary consumers |  | |  | |  | | --- | |  | | E. A and B |  |  |  | | --- | | Answer Key: A | |  | |
| |  |  | | --- | --- | | Question 28 of 35 | 0.0 Points |   At a global level, most of the net primary productivity on the planet occurs in d .NPP is equally represented in all of these locations.   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. The sum of all the terrestrial biomes |  | | orrect | |  | | --- | |  | | B. the world’s oceans |  | |  | |  | | --- | |  | | C. the atmosphere |  |  |  | | --- | | Answer Key: B | |  | |
| |  |  | | --- | --- | | Question 29 of 35 | 0.0 Points |   Which of these patterns represents density independent population regulation?   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | orrect | |  | | --- | |  | | A. A |  | |  | |  | | --- | |  | | B. B |  | |  | |  | | --- | |  | | C. Both |  | |  | |  | | --- | |  | | D. Neither. |  |  |  | | --- | | Answer Key: A | |  | |
| |  |  | | --- | --- | | Question 30 of 35 | 0.0 Points |   What happens in a community when two species directly compete for a limited resource?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Coexistence |  | | orrect | |  | | --- | |  | | B. The superior competitor wins |  | |  | |  | | --- | |  | | C. The inferior competitor wins |  | |  | |  | | --- | |  | | D. Both species die off |  |  |  | | --- | | Answer Key: B | |  | |
| |  |  | | --- | --- | | Question 31 of 35 | 0.0 Points |   The exponential and logistic models differ in that   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. The exponential asymptotes |  | |  | |  | | --- | |  | | B. The logistic includes a density component that represents interspecific competition |  | |  | |  | | --- | |  | | C. The point of inflection represents the slowest increase in population size with time |  | |  | |  | | --- | |  | | D. The logistic includes a competition coefficient |  | | orrect | |  | | --- | |  | | E. None of these. |  |  |  | | --- | | Answer Key: E | |  | |
| |  |  | | --- | --- | | Question 32 of 35 | 0.0 Points |   Which of the following survivorship curves most applies to humans living in developed countries?   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | orrect | |  | | --- | |  | | A. curve A |  | |  | |  | | --- | |  | | B. curve B |  | |  | |  | | --- | |  | | C. curve C |  | |  | |  | | --- | |  | | D. curve A or curve B |  | |  | |  | | --- | |  | | E. curve B or curve C |  |  |  | | --- | | Answer Key: A | |  | |
| |  |  | | --- | --- | | Question 33 of 35 | 0.0 Points |   Theoretically, which would be the most effective way to disrupt a Hadley cell?   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Increase moisture at the poles. |  | | orrect | |  | | --- | |  | | B. Remove all moisture and convection from the equator. |  | |  | |  | | --- | |  | | C. Remove the tilt in the earth’s axis so the Sun always shines directly on the equator. |  | |  | |  | | --- | |  | | D. Extensively water the deserts. |  | |  | |  | | --- | |  | | E. B and C. |  |  |  | | --- | | Answer Key: B | |  | |
| |  |  | | --- | --- | | Question 34 of 35 | 0.0 Points |   As spring conditions begin, the surface waters of the pond below   |  |  | | --- | --- | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. Warm and remain stratified at the surface |  | |  | |  | | --- | |  | | B. Sink down a few feet and then create stratified layer in the middle of the pond |  | | orrect | |  | | --- | |  | | C. Warm and sink down to the lake bottom. |  | |  | |  | | --- | |  | | D. Any of these is possible. |  |  |  | | --- | | Answer Key: C | |  | |
| |  |  | | --- | --- | | Question 35 of 35 | 0.0 Points |   According to the Shannon Diversity Index, a species composition ratio of 9:2:1 is \_\_\_\_\_\_\_\_\_\_\_\_ a ratio of 4:4:4.   |  | | --- | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | |  | | --- | |  | | A. more diverse than |  | | orrect | |  | | --- | |  | | B. less diverse than |  | |  | |  | | --- | |  | | C. equally as diverse as |  | |  | |  | | --- | |  | | D. higher in evenness than |  | |  | |  | | --- | |  | | E. None of these. |  |  |  | | --- | | Answer Key: B | |  | |