|  |
| --- |
| **Multiple Choice** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Nucleic acids are important information storage molecules present in virtually every cell. Which of the processes is carried out by a cell when it accesses that information in the DNA of the genes?

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| --- | --- | --- |
|   | a.  | transcription and translation |
|   | b.  | DNA replication and transcription |
|   | c.  | DNA replication and translation |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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| 2. Observations are used by scientists to draw tentative explanations called hypotheses.

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| --- | --- | --- |
|   | a.  | true |
|   | b.  | false |

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| --- | --- |
| *ANSWER:* | a |

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| 3. When small molecules are linked together to form larger molecules, the increase in entropy typically comes from:

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| --- | --- | --- |
|   | a.  | gas produced. |
|   | b.  | light captured (for example, in photosynthesis). |
|   | c.  | work done (for example, creation of new bonds in larger molecules). |
|   | d.  | heat loss. |
|   | e.  | enzymes utilized. |

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| *ANSWER:* | d |

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| 4. Which process is an example of the first law of thermodynamics in action?

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| --- | --- | --- |
|   | a.  | As monomers combine into polymers, the disorder inside the cell decreases. |
|   | b.  | Light energy is transformed into chemical energy during photosynthesis. |
|   | c.  | Energy is created by cells during ATP synthesis. |
|   | d.  | Some energy is released as heat during metabolic processes. |

|  |  |
| --- | --- |
| *ANSWER:* | b |

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| 5. Consider the image. If the ostrich egg shown in the photo is not fertilized, it is composed of approximately how many cells?

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 100 |
|   | c.  | 10,000 |
|   | d.  | 1,000,000 |
|   | e.  | 100,000,000 |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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| 6. Imagine that you are standing in a field and you see a group of butterflies. You notice an individual butterfly that looks significantly different from the others in the population. Its difference allows the butterfly to escape predation more efficiently than the other butterflies. How might this trait have arisen in the individual?

|  |  |  |
| --- | --- | --- |
|   | a.  | There were more predators in the surrounding area, so the butterfly needed the trait in order to escape predation. |
|   | b.  | There was a mutation in a gene that led to differences in the ability to attract mates. |
|   | c.  | There was a random mutation in a gene that led to differences in the ability to escape predation. |
|   | d.  | There were more predators in the surrounding area, so the butterflies allowed themselves to be caught to save the faster butterflies in the population. |

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| --- | --- |
| *ANSWER:* | c |

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| 7. All of the classifications are considered domains of life except:

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| --- | --- | --- |
|   | a.  | Bacteria. |
|   | b.  | Eukarya. |
|   | c.  | Archaea. |
|   | d.  | Protists. |
|   | e.  | Protists, Eukarya, Archaea, and Bacteria are all domains of life. |

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| *ANSWER:* | d |

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| 8. Consider the phylogenetic tree. According to this phylogenetic tree, the primate most closely related to humans is the:

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| --- | --- | --- |
|   | a.  | lemur. |
|   | b.  | chimpanzee. |
|   | c.  | gorilla. |
|   | d.  | orangutan |
|   | e.  | gibbon. |

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| *ANSWER:* | b |

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| 9. Trees in the desert and trees in the rainforest experience vast differences in the amount of water available for uptake. Water can be lost from the leaf surface very easily in dry and hot regions. What types of differences might you expect between tree species in a rainforest compared with those in a desert?

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|   | a.  | Rainforest trees have fewer adaptations for conserving water than desert trees. |
|   | b.  | Rainforest trees have adaptations for requiring less water than trees in the desert. |
|   | c.  | Rainforest trees do not have any adaptations related to water conservation or loss. |
|   | d.  | Rainforest trees have more adaptations for water conservation and loss than trees in the desert. |

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| *ANSWER:* | a |

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| 10. Ecological relationships reflect the \_\_\_\_\_ traits of organisms in nature.

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| --- | --- | --- |
|   | a.  | biomechanical |
|   | b.  | behavioral and physiological |
|   | c.  | behavioral |
|   | d.  | physiological |
|   | e.  | behavioral, physiological, and biomechanical |

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| *ANSWER:* | e |

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| 11. The figure illustrates the projected changes in distributions of beech trees and chinquapin oak trees in Japan if human activities continue to cause global temperatures to rise.Which of the statements accurately reflects these predictions?

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| --- | --- | --- |
|   | a.  | Beech trees will become extinct |
|   | b.  | The distribution of beech and chinquapin oak in areas where they are found together will stay the same. |
|   | c.  | Beech distribution will increase to the south of its present-day distribution. |
|   | d.  | Chinquapin oak distribution will increase with rising temperatures. |

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| *ANSWER:* | d |

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| 12. Which one of the statements about the human impact on Earth's ecology is correct?

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| --- | --- | --- |
|   | a.  | All of these statements about the human impact on Earth's ecology are correct. |
|   | b.  | Agriculture has increased abundance and distribution of some species, while decreasing abundance and distribution of other species. |
|   | c.  | Humans commandeer as much as 25% of all photosynthetic production on land. |
|   | d.  | More atmospheric nitrogen is converted to ammonia by humans than by the rest of nature. |
|   | e.  | Human activities produce more carbon dioxide than do volcanoes. |

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| *ANSWER:* | a |

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| 13. What is a hypothesis?

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|   | a.  | the same thing as an unproven theory |
|   | b.  | a tentative explanation that can be tested by experiments |
|   | c.  | a verifiable observation |
|   | d.  | an experiment that leads to a prediction |
|   | e.  | None of the other answer options is correct. |

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| *ANSWER:* | b |

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| 14. When carrying out a controlled experiment, it is important to:

|  |  |  |
| --- | --- | --- |
|   | a.  | subject different groups to different conditions. |
|   | b.  | change multiple variables at once to see the full effect of the variables. |
|   | c.  | change only one variable at a time. |
|   | d.  | All of these choices are correct. |

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| *ANSWER:* | c |

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| 15. A hypothesis is considered a theory when the:

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| --- | --- | --- |
|   | a.  | results of several experiments do not support the hypothesis. |
|   | b.  | results of a single experiment support the hypothesis. |
|   | c.  | hypothesis has been revised many times. |
|   | d.  | results of several experiments support the hypothesis. |

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| *ANSWER:* | d |

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| 16. Which one of the steps would occur last as part of the scientific inquiry?

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| --- | --- | --- |
|   | a.  | prediction |
|   | b.  | hypothesis |
|   | c.  | experimentation |
|   | d.  | observation |

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| --- | --- |
| *ANSWER:* | c |

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| 17. Which one of the statements explains a characteristic of both all living organisms and all nonliving material?

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| --- | --- | --- |
|   | a.  | They both conform to the basic laws of chemistry and physics. |
|   | b.  | They both have the capacity to evolve. |
|   | c.  | They both have the ability to reproduce. |
|   | d.  | They both are complex, with spatial organization at several levels. |
|   | e.  | They both have the ability to change in response to the environment. |

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| *ANSWER:* | a |

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| 18. The first law of thermodynamics states that the degree of disorder in the universe tends to increase.

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| --- | --- | --- |
|   | a.  | true |
|   | b.  | false |

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| *ANSWER:* | b |

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| 19. In which of the examples is the entropy definitely increasing?

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| --- | --- | --- |
|   | a.  | photosynthesis |
|   | b.  | making a house of playing cards |
|   | c.  | melting ice in a glass of soda |
|   | d.  | placing marbles in a row |

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| *ANSWER:* | c |

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| 20. Which of the examples are cellular life forms: virus, yeast, bacteria, plant, animal?

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| --- | --- | --- |
|   | a.  | All are cellular except viruses. |
|   | b.  | All are cellular except bacteria. |
|   | c.  | All are cellular except yeast. |
|   | d.  | Only plants and animals are cellular |
|   | e.  | All of these choices are correct. |

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| *ANSWER:* | a |

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| 21. A retrovirus hijacks a cell's machinery to turn its own RNA into DNA, which is then inserted into the cell's genome so that viral proteins can be made. Does this follow the central dogma?

|  |  |  |
| --- | --- | --- |
|   | a.  | yes |
|   | b.  | no |

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| --- | --- |
| *ANSWER:* | b |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22. Imagine you are standing in a field and you see a group of butterflies. You notice an individual that looks significantly different from the other butterflies in the population. It has much larger wings and can fly faster than the other butterflies. This difference allows the butterfly to escape predation more efficiently than other butterflies in the population. The difference came about because this butterfly spent more time developing in an area of the habitat that is particularly warm and moist and had more food available than other areas. Do you expect the following generations to be composed of butterflies with larger wings?

|  |  |  |
| --- | --- | --- |
|   | a.  | No, this represents nonheritable variation caused by the environment. |
|   | b.  | No, this represents heritable variation but this trait does not increase ability to mate so will not be passed to the next generation. |
|   | c.  | Yes, this represents a genetic mutation that will be passed onto offspring. |
|   | d.  | Yes, this trait is advantageous so more butterflies will choose to develop in warm moist areas of the habitat. |

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| *ANSWER:* | a |

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| 23. Most of life's diversity is:

|  |  |  |
| --- | --- | --- |
|   | a.  | aquatic. |
|   | b.  | acellular. |
|   | c.  | aerobic. |
|   | d.  | terrestrial. |
|   | e.  | microbial. |

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| *ANSWER:* | e |

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| 24. Which one of the types of organisms most closely resembles the first cells on Earth?

|  |  |  |
| --- | --- | --- |
|   | a.  | bacteria |
|   | b.  | algae |
|   | c.  | fungi |
|   | d.  | plant cells |
|   | e.  | animal cells |

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| --- | --- |
| *ANSWER:* | a |

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| 25. Which one of the statements about viruses is correct?

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| --- | --- | --- |
|   | a.  | Some types of viruses integrate their genomes into the genome of the host organism. |
|   | b.  | Viruses use the cellular machinery of other organisms to replicate the virus's genetic material. |
|   | c.  | The genomes of viruses are enclosed in a protein coat and occasionally a lipid bilayer envelope. |
|   | d.  | Viruses are valuable tools in biological research. |
|   | e.  | All of these choices are correct. |

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| *ANSWER:* | e |

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| 26. Some plants are dependent on animals for:

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| --- | --- | --- |
|   | a.  | seed dispersion only. |
|   | b.  | pollination, seed dispersion, and respiration. |
|   | c.  | pollination only. |
|   | d.  | pollination and seed dispersion. |
|   | e.  | respiration only. |

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| *ANSWER:* | d |

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| 27. If the duration of life on Earth was on a scale of 20,000 days, for how many of those days would the human species be present?

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 100 |
|   | c.  | 2000 |
|   | d.  | 10,000 |
|   | e.  | 20,000 |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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| 28. Which one of the organisms has been most damaged by the influence of humans?

|  |  |  |
| --- | --- | --- |
|   | a.  | rats |
|   | b.  | corn |
|   | c.  | cockroaches |
|   | d.  | apples |
|   | e.  | white rhinos |

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| *ANSWER:* | e |

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| 29. Humans have affected different organismal populations in which ways?

|  |  |  |
| --- | --- | --- |
|   | a.  | All of these choices are correct. |
|   | b.  | habitat destruction |
|   | c.  | agriculture |
|   | d.  | overfishing |

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| *ANSWER:* | a |

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| 30. Hypotheses can only be tested by doing experiments.

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| --- | --- | --- |
|   | a.  | true |
|   | b.  | false |

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| --- | --- |
| *ANSWER:* | b |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 31. Let's say you feel very strongly that cigarette smoke does not increase the probability of getting cancer, and you base your view on something you read on the Internet. This is a good example of a(n):

|  |  |  |
| --- | --- | --- |
|   | a.  | experiment. |
|   | b.  | observation. |
|   | c.  | hypothesis. |
|   | d.  | theory. |
|   | e.  | None of the other answer options is correct. |

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| *ANSWER:* | e |

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| 32. Many salmon return to the place where they were born to spawn (reproduce). You hypothesize that they use visual cues to find their way back. To test your hypothesis, you blind salmon and then examine whether or not they are able to return to their birthplace. You find that they are able to find their way back. From this experiment, you:

|  |  |  |
| --- | --- | --- |
|   | a.  | have rejected your hypothesis. |
|   | b.  | have proven your hypothesis. |
|   | c.  | supported your hypothesis. |
|   | d.  | can't determine whether your hypothesis is supported or not. |
|   | e.  | developed a theory about the role of vision in salmon navigation. |

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| *ANSWER:* | a |

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| 33. Which order accurately reflects the process of science as described in your textbook?

|  |  |  |
| --- | --- | --- |
|   | a.  | Observation → question → hypothesis formulation → experiment → support or refute hypothesis |
|   | b.  | Observation → hypothesis formulation → question → experiment → prediction |
|   | c.  | Observation → question → hypothesis formulation → experiment → prove or disprove hypothesis |
|   | d.  | Observation → question → experiment → hypothesis formulation → prove or disprove hypothesis |
|   | e.  | Observation → question → experiment → hypothesis formulation → support or refute hypothesis |

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| *ANSWER:* | a |

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| 34. An explanation supported by a large body of observations and experimentation is referred to as a(n):

|  |  |  |
| --- | --- | --- |
|   | a.  | hypothesis. |
|   | b.  | prediction. |
|   | c.  | theory. |
|   | d.  | supposition. |
|   | e.  | investigation. |

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| *ANSWER:* | c |

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| 35. In the 1600s, Francesco Redi demonstrated that living organisms come from other living organisms. However, it would be inaccurate to say that Redi supported his hypothesis because:

|  |  |  |
| --- | --- | --- |
|   | a.  | his experiment didn't have the proper controls. |
|   | b.  | his experiment was done so long ago. |
|   | c.  | his experiment was based on observations. |
|   | d.  | his experiment only investigated a single kind of meat. |
|   | e.  | his experiment only investigated a single organism. |

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| *ANSWER:* | e |

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| 36. When you eat a hamburger, some of the energy in the food is converted to ATP that your cells can use to do all kinds of work, some of the energy is stored for later use, and some of the energy is dissipated as heat. The amount of energy before and after eating the hamburger is the same. This illustrates the:

|  |  |  |
| --- | --- | --- |
|   | a.  | the theory of evolution. |
|   | b.  | second law of thermodynamics. |
|   | c.  | cell theory. |
|   | d.  | first law of thermodynamics. |
|   | e.  | central dogma. |

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| *ANSWER:* | d |

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| 37. When you eat a hamburger, some of the energy in the food is converted to ATP that your cells can use to do all kinds of work, some of the energy is stored for later use, and some of the energy is dissipated as heat. In other words, you can only make use of a portion of the energy available in the hamburger because some is always lost as heat. This is a consequence of the:

|  |  |  |
| --- | --- | --- |
|   | a.  | second law of thermodynamics. |
|   | b.  | first law of thermodynamics. |
|   | c.  | cell theory. |
|   | d.  | theory of evolution. |
|   | e.  | central dogma. |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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| 38. Which one of the elements makes up more than 40% of both living organisms and the Earth's crust?

|  |  |  |
| --- | --- | --- |
|   | a.  | hydrogen |
|   | b.  | oxygen |
|   | c.  | silicon |
|   | d.  | carbon |
|   | e.  | nitrogen |

|  |  |
| --- | --- |
| *ANSWER:* | b |

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| 39. When we say that the cell is the fundamental unit of life, we mean that:

|  |  |  |
| --- | --- | --- |
|   | a.  | life doesn't exist in the absence of cells. |
|   | b.  | all living things are made up of one or more cells. |
|   | c.  | the smallest entity that can be considered living is a cell. |
|   | d.  | a single cell can carry out all life processes. |
|   | e.  | all of these choices are correct. |

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| *ANSWER:* | e |

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| 40. The metabolic pathway that harvests energy molecules from glucose is highly conserved across many different organisms. This statement means that in each of these organisms the metabolic pathway:

|  |  |  |
| --- | --- | --- |
|   | a.  | is subject to the first law of thermodynamics. |
|   | b.  | is the same or very similar. |
|   | c.  | is subject to the second law of thermodynamics. |
|   | d.  | is very different from each other. |
|   | e.  | obeys the law of the conservation of energy. |

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| --- | --- |
| *ANSWER:* | b |

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| 41. The three main groups, or domains, of organisms are:

|  |  |  |
| --- | --- | --- |
|   | a.  | Bacteria, Archaea, and Eukarya. |
|   | b.  | animals, plants, and Bacteria. |
|   | c.  | animals, plants, and fungi. |
|   | d.  | Bacteria, Archaea, and prokaryotes. |
|   | e.  | animals, plants, and protists. |

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| --- | --- |
| *ANSWER:* | a |

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| 42. The first cells were most similar to:

|  |  |  |
| --- | --- | --- |
|   | a.  | prokaryotes. |
|   | b.  | eukaryotes. |
|   | c.  | multicellular forms. |
|   | d.  | viruses. |
|   | e.  | None of the other answer options is correct. |

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| --- | --- |
| *ANSWER:* | a |

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| 43. A mutation in \_\_\_\_\_ results in a change in \_\_\_\_\_ that sometimes produces a(n) \_\_\_\_\_ with altered structure and function.

|  |  |  |
| --- | --- | --- |
|   | a.  | protein; RNA; DNA |
|   | b.  | RNA; DNA; protein |
|   | c.  | protein; DNA; RNA |
|   | d.  | DNA; RNA; protein |
|   | e.  | RNA; protein; DNA |

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| --- | --- |
| *ANSWER:* | d |

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| 44. Which of the statements is the best description of mutations in DNA?

|  |  |  |
| --- | --- | --- |
|   | a.  | They do not affect an organism. |
|   | b.  | They arise in order to harm an organism. |
|   | c.  | They occur randomly. |
|   | d.  | They arise in order to benefit an organism. |
|   | e.  | All of these choices are correct. |

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| --- | --- |
| *ANSWER:* | c |

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| 45. Santiago Elena and Richard Lenski performed long-term artificial selection experiments with bacteria. Over time, the bacteria evolved an ability to use succinate as a food source. Which of the statements is a conclusion of these experiments?

|  |  |  |
| --- | --- | --- |
|   | a.  | All of these choices are correct. |
|   | b.  | Evolution can occur in the laboratory. |
|   | c.  | Bacteria can evolve over time. |
|   | d.  | Bacteria can evolve an improved ability to use succinate. |
|   | e.  | Natural selection can occur in the laboratory. |

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| *ANSWER:* | a |

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| 46. Consider the phylogenetic tree. The phylogenetic tree shown represents a phylogeny of different species of butterflies. What is represented by the circled area on the phylogeny?

|  |  |  |
| --- | --- | --- |
|   | a.  | the most recent speciation event |
|   | b.  | the appearance of a new mutation |
|   | c.  | the appearance of a new genetic variant |
|   | d.  | a common ancestor |
|   | e.  | a species that must be extinct |

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| --- | --- |
| *ANSWER:* | d |

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| 47. The metabolic pathway that harvests energy molecules from glucose is highly conserved across many different organisms. From this observation, scientists conclude that the metabolic pathway:

|  |  |  |
| --- | --- | --- |
|   | a.  | is nonessential. |
|   | b.  | arose late in the evolution of life. |
|   | c.  | was conserved simply by chance. |
|   | d.  | arose early in the evolution of life. |
|   | e.  | None of the other answer options is correct. |

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| *ANSWER:* | d |

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| 48. Transcription is the process by which:

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| --- | --- | --- |
|   | a.  | DNA is synthesized from protein. |
|   | b.  | proteins are synthesized from RNA molecules. |
|   | c.  | proteins are synthesized from DNA molecules. |
|   | d.  | RNA is synthesized from protein. |
|   | e.  | RNA is synthesized from DNA. |

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| *ANSWER:* | e |

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| 49. Mutations always result in the death of the organism that acquires them.

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|   | a.  | true |
|   | b.  | false |

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| --- | --- |
| *ANSWER:* | b |

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| 50. Imagine walking through a tropical rainforest. You notice that there are different types of trees, birds, insects, and a plethora of other living things. A few weeks later you are taking a walk through the desert and notice that the trees, birds, insects, and many other living things are different than those you saw in the rainforest. Which of the statements best explains the differences between each of these ecological systems?

|  |  |  |
| --- | --- | --- |
|   | a.  | The manner in which organisms interact with each other and their physical environment shapes the diversity found in an ecological system. |
|   | b.  | Organisms that evolved in the rainforest found it easier to live in that ecological system, so they have not spread out to evolve adaptations necessary to live in the desert. |
|   | c.  | Organisms in each ecological system haven't had enough time to evolve the adaptations necessary to live in the other ecosystem; with enough time, organisms in each ecological system will evolve adaptations for the other ecological system. |
|   | d.  | Organisms in each ecological system are there by chance, and their presence in different ecological systems does not have a biological explanation. |
|   | e.  | All of these choices are correct. |

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| *ANSWER:* | a |

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| 51. Interactions between organisms lead to the evolution of particular traits in populations of those organisms over time.

|  |  |  |
| --- | --- | --- |
|   | a.  | true |
|   | b.  | false |

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| *ANSWER:* | a |

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| 52. Variation among individuals in a species is usually caused by:

|  |  |  |
| --- | --- | --- |
|   | a.  | both environmental and genetic variation. |
|   | b.  | environmental, genetic, and infectious variation. |
|   | c.  | environmental variation only. |
|   | d.  | genetic variation only. |
|   | e.  | infectious variation only. |

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| --- | --- |
| *ANSWER:* | a |

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| 53. The chemical reactions required to sustain life are collectively referred to as a cell's:

|  |  |  |
| --- | --- | --- |
|   | a.  | physiology. |
|   | b.  | metabolism. |
|   | c.  | genetics. |
|   | d.  | anatomy. |
|   | e.  | All of the choices are correct. |

|  |  |
| --- | --- |
| *ANSWER:* | b |

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| 54. Ultraviolet (UV) light can penetrate the skin and damage DNA, and it can also destroy the B vitamin folate needed for bone-marrow maturation and the development of red blood cells. On the other hand, exposure to ultraviolet light is beneficial in the synthesis of vitamin D3, which is important for growth, calcium absorption, and bone development. The amount of ultraviolet light that penetrates the skin depends on the skin's pigmentation: more melanin (skin pigment) means less penetration. Which of the statements do you think best describes natural selection as it applies to human skin pigmentation?

|  |  |  |
| --- | --- | --- |
|   | a.  | Natural selection favors skin with more pigment. |
|   | b.  | Natural selection favors skin with less pigment. |
|   | c.  | Natural selection favors darker or lighter skin, depending on the intensity of UV in a geographical region. |

|  |  |
| --- | --- |
| *ANSWER:* | c |

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| 55. Imagine you are standing in a field and you see a group of butterflies. You notice that the butterflies are not identical to each other even though they are all from the same species and the same population. Indicate whether the differences could explain the variation you see in the butterflies.Variations in the genetic material among the butterflies:

|  |  |  |
| --- | --- | --- |
|   | a.  | could explain the variation seen in the butterflies. |
|   | b.  | could not explain the variation seen in the butterflies. |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 56. Imagine you are standing in a field and you see a group of butterflies. You notice that the butterflies are not identical to each other even though they are all from the same species and the same population. Indicate whether the differences could explain the variation you see in the butterflies.Differences within the population that result from variation in the environment:

|  |  |  |
| --- | --- | --- |
|   | a.  | could explain the variation seen in the butterflies. |
|   | b.  | could not explain the variation seen in the butterflies. |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 57. Imagine you are standing in a field and you see a group of butterflies. You notice that the butterflies are not identical to each other even though they are all from the same species and the same population. Indicate whether the differences could explain the variation you see in the butterflies.Differences in the type of food consumed by each butterfly in the population:

|  |  |  |
| --- | --- | --- |
|   | a.  | could explain the variation seen in the butterflies. |
|   | b.  | could not explain the variation seen in the butterflies. |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 58. Imagine you are standing in a field and you see a group of butterflies. You notice that the butterflies are not identical to each other even though they are all from the same species and the same population. Indicate whether the differences could explain the variation you see in the butterflies.Differences in the temperature in which each butterfly developed:

|  |  |  |
| --- | --- | --- |
|   | a.  | could explain the variation seen in the butterflies. |
|   | b.  | could not explain the variation seen in the butterflies. |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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| 59. The effect of increasing human populations can be seen in many different ways. Which of the choices describe(s) how human actions have caused evolutionary changes in different organisms? Indicate whether each of the human actions caused evolutionary changes in the organism described.Increased use of antibiotics has caused many bacterial strains to become resistant.

|  |  |  |
| --- | --- | --- |
|   | a.  | Human behavior caused this evolutionary change to occur. |
|   | b.  | Human behavior did not cause this evolutionary change. |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 60. The effect of increasing human populations can be seen in many different ways. Which of the choices describe(s) how human actions have caused evolutionary changes in different organisms? Indicate whether each of the human actions caused evolutionary changes in the organism described.Planting different commercial crops has increased their worldwide distribution.

|  |  |  |
| --- | --- | --- |
|   | a.  | Human behavior caused this evolutionary change to occur. |
|   | b.  | Human behavior did not cause this evolutionary change. |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 61. The effect of increasing human populations can be seen in many different ways. Which of the choices describe(s) how human actions have caused evolutionary changes in different organisms? Indicate whether each of the human actions caused evolutionary changes in the organism described.Worldwide, more forests have been declining due to human interest in acquiring lumber for construction.

|  |  |  |
| --- | --- | --- |
|   | a.  | Human behavior caused this evolutionary change to occur. |
|   | b.  | Human behavior did not cause this evolutionary change. |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 62. Read the scenario: You get in your car to drive to class. You turn the key, and the engine starts making a clicking sound, but does not start (1). You think to yourself, "The battery must be dead" (2). So, you borrow the battery from your neighbor's car (with permission, of course) and exchange it for the one in your car (3). You figure that if the battery in your car is dead and you replace it then the car will start (4). You get in the car again, turn the key, and the car starts right up (5), and you make it to class on time.Notice that there are numbers at the end or parts of some of the sentences in the scenario. Refer to these numbers when answering the question.Which sentence, or part of a sentence, in the story is a hypothesis?

|  |  |  |
| --- | --- | --- |
|   | a.  | 2 |
|   | b.  | 1 |
|   | c.  | 3 |
|   | d.  | 4 |
|   | e.  | 5 |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 63. Read the scenario: You get in your car to drive to class. You turn the key, and the engine starts making a clicking sound, but does not start (1). You think to yourself, "The battery must be dead" (2). So, you borrow the battery from your neighbor's car (with permission, of course) and exchange it for the one in your car (3). You figure that if the battery in your car is dead and you replace it then the car will start (4). You get in the car again, turn the key, and the car starts right up (5), and you make it to class on time.Notice that there are numbers at the end or parts of some of the sentences in the scenario. Refer to these numbers when answering the question.Which sentence, or part of a sentence, in the story provides support that the idea about the battery being dead is correct?

|  |  |  |
| --- | --- | --- |
|   | a.  | 5 |
|   | b.  | 1 |
|   | c.  | 2 |
|   | d.  | 3 |
|   | e.  | 4 |

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| --- | --- |
| *ANSWER:* | a |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 64. Read the scenario: You get in your car to drive to class. You turn the key, and the engine starts making a clicking sound, but does not start (1). You think to yourself, "The battery must be dead" (2). So, you borrow the battery from your neighbor's car (with permission, of course) and exchange it for the one in your car (3). You figure that if the battery in your car is dead and you replace it then the car will start (4). You get in the car again, turn the key, and the car starts right up (5), and you make it to class on time.Notice that there are numbers at the end or parts of some of the sentences in the scenario. Refer to these numbers when answering the question.Which sentence, or part of a sentence, in the story is an observation?

|  |  |  |
| --- | --- | --- |
|   | a.  | 1 |
|   | b.  | 2 |
|   | c.  | 3 |
|   | d.  | 4 |
|   | e.  | 5 |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 65. Read the scenario: You get in your car to drive to class. You turn the key, and the engine starts making a clicking sound, but does not start (1). You think to yourself, "The battery must be dead" (2). So, you borrow the battery from your neighbor's car (with permission, of course) and exchange it for the one in your car (3). You figure that if the battery in your car is dead and you replace it then the car will start (4). You get in the car again, turn the key, and the car starts right up (5), and you make it to class on time.Notice that there are numbers at the end or parts of some of the sentences in the scenario. Refer to these numbers when answering the question.Which sentence, or part of a sentence, in the story is an experiment?

|  |  |  |
| --- | --- | --- |
|   | a.  | 3 |
|   | b.  | 2 |
|   | c.  | 4 |
|   | d.  | 1 |
|   | e.  | 5 |

|  |  |
| --- | --- |
| *ANSWER:* | a |

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