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Regents Review Assignment #9-J08 Living Environment: Comet 2010-2011

Part A Questions

_____1. The chart below contains both autotrophic and heterotrophic organisms. Organisms that carry out only heterotrophic nutrition are found in

A	owl	cat	shark
B	mouse	corn	dog
C	squirrel	bluebird	alga

(1) row *A*, only (3) rows *A* and *B*
(2) row *B*, only (4) rows *A* and *C*

_____2. At warm temperatures, a certain bread mold can often be seen growing on bread as a dark-colored mass. The same bread mold growing on bread in a cooler environment is red in color. Which statement most accurately describes why this change in the color of the bread mold occurs?

(1) Gene expression can be modified by interactions with the environment.
(2) Every organism has a different set of codedinstructions.
(3) The DNA was altered in response to an environmental condition.
(4) There is no replication of genetic material in the cooler environment.

_____3. Humans require organ systems to carry out life processes. Single-celled organisms do not have organ systems and yet they are able to carry out life processes. This is because

(1) human organ systems lack the organelles found in single-celled organisms
(2) a human cell is more efficient than the cell of a single-celled organism
(3) it is not necessary for single-celled organisms to maintain homeostasis
(4) organelles present in single-celled organisms act in a manner similar to organ systems

_____4. Which nuclear process is represented below?

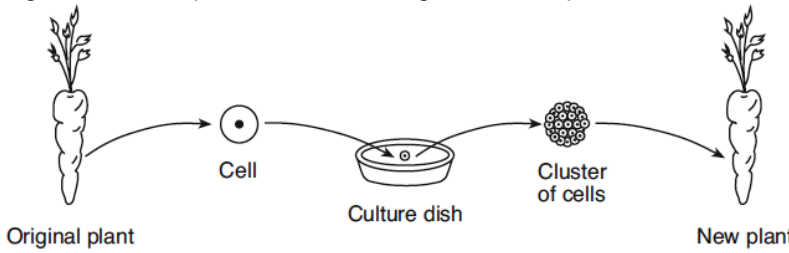
A DNA molecule untwists. → The two strands of DNA separate. → Molecular bases pair up. → Two identical DNA molecules are produced.

(1) recombination (2) fertilization (3) replication (4) mutation

_____5. Certain insects resemble the bark of the trees on which they live. Which statement provides a possible biological explanation for this resemblance?

(1) The insects needed camouflage so they developed protective coloration.
(2) Natural selection played a role in the development of this protective coloration.
(3) The lack of mutations resulted in the protective coloration.
(4) The trees caused mutations in the insects that resulted in protective coloration.

_____6. The diagram below represents the cloning of a carrot plant.



Compared to each cell of the original carrot plant, each cell of the new plant will have

(1) the same number of chromosomes and the same types of genes
(2) the same number of chromosomes, but different types of genes
(3) half the number of chromosomes and the same types of genes
(4) half the number of chromosomes, but different types of genes

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Part B-1 Questions

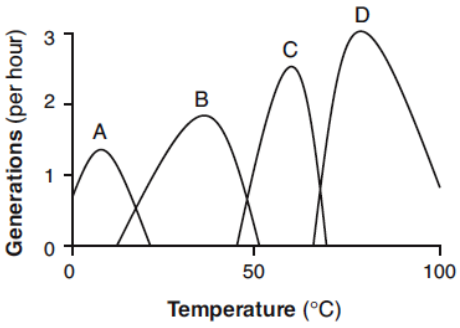
_____7. In the United States, there has been relatively little experimentation involving the insertion of genes from other species into human DNA. One reason for the lack of these experiments is that

(1) the subunits of human DNA are different from the DNA subunits of other species
(2) there are many ethical questions to be answered before inserting foreign genes into human DNA
(3) inserting foreign DNA into human DNA would require using techniques completely different from those used to insert foreign DNA into the DNA of other mammals
(4) human DNA always promotes human survival, so there is no need to alter it

_____8. A student performed an experiment to demonstrate that a plant needs chlorophyll for photosynthesis. He used plants that had green leaves with white areas. After exposing the plants to sunlight, he removed a leaf from each plant and processed the leaves to remove the chlorophyll. He then tested each leaf for the presence of starch. Starch was found in the area of the leaf that was green, and no starch was found in the area of the leaf that was white. He concluded that chlorophyll is necessary for photosynthesis. Which statement represents an assumption the student had to make in order to draw this conclusion?

(1) Starch is synthesized from the glucose produced in the green areas of the leaf.
(2) Starch is converted to chlorophyll in the green areas of the leaf.
(3) The white areas of the leaf do not have cells.
(4) The green areas of the leaf are heterotrophic.

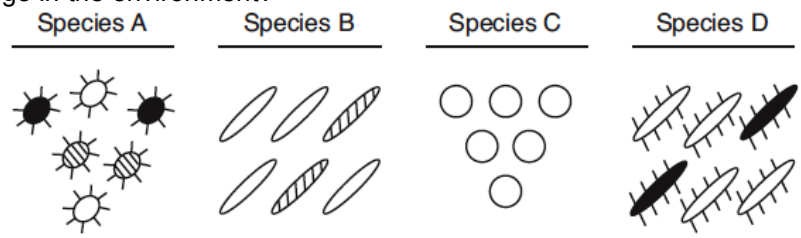
The graph provides information about the reproductive rates of four species of bacteria, *A*, *B*, *C*, and *D*, at different temperatures.



_____9. Which statement is a valid conclusion based on the information in the graph?

(1) Changes in temperature cause bacteria to adapt to form new species.
(2) Increasing temperatures speed up bacterial reproduction.
(3) Bacteria can survive only at temperatures between 0°C and 100°C.
(4) Individual species reproduce

_____10. The diagram below represents four different species of bacteria. Which statement is correct concerning the chances of survival for these species if there is a change in the environment?



(1) Species *A* has the best chance of survival because it has the most genetic diversity.
(2) Species *C* has the best chance of survival because it has no gene mutations.
(3) Neither species *B* nor species *D* will survive because they compete for the same resources.
(4) None of the species will survive because bacteria reproduce asexually.

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Part B-2 Questions

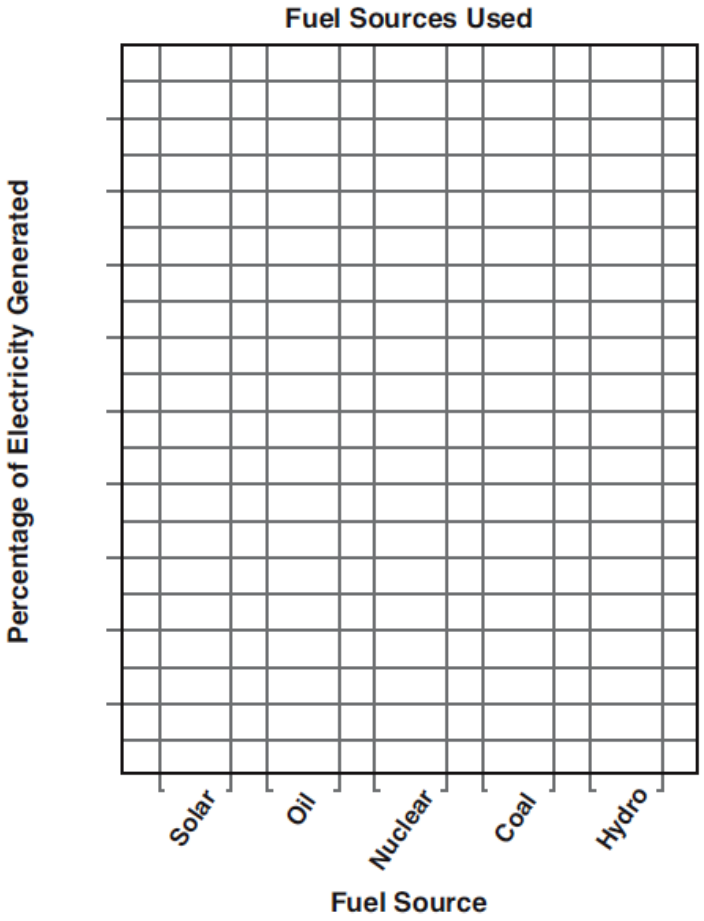
Base your answers to questions 11 through 15 on the information below and on your knowledge of biology.

Each year, a New York State power agency provides its customers with information about some of the fuel sources used in generating electricity. The table below applies to the period of 2002–2003.

Fuel Sources Used

Fuel Source	Percentage of Electricity Generated
hydro (water)	86
coal	5
nuclear	4
oil	1
solar	0

Directions (11 and 12): Using the information given, construct a bar graph *on the grid below*, following the directions below.



11. Mark an appropriate scale on the axis labeled "Percentage of Electricity Generated." [1]

12. Construct vertical bars to represent the data. Shade in *each* bar. [1]

13. Identify *one* fuel source in the table that is considered a fossil fuel. [1]

_____

14. Identify *one* fuel source in the table that is classified as a renewable resource. [1]

_____

15. State *one* specific environmental problem that can result from burning coal to generate electricity. [1]

_____

_____

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Part C Questions

Base your answers to questions 16 and 17 on the information below and on your knowledge of biology.
Insulin is a hormone that has an important role in the maintenance of homeostasis in humans.

16. Identify the structure in the human body that is the usual source of insulin. [1]

_____

17. Identify a substance in the blood, other than insulin, that could change in concentration and indicate a person is not secreting insulin in normal amounts. [1]

_____

Base your answers to questions 18 through 20 on the information below and on your knowledge of biology.

"The last known wolf native to the Adirondack Mountains of New York State was killed over a century ago. Several environmental groups have recently proposed reintroducing the wolf to the Adirondacks. These groups claim there is sufficient prey to support a wolf population in this area. These prey include beaver, deer, and moose. Opponents of this proposal state that the Adirondacks already have a dominant predator, the Eastern coyote."

18. State *one* effect the reintroduction of the wolf may have on the coyote population within the Adirondacks. Explain why it would have this effect. [1]

_____

_____

19. Explain why the coyote is considered a limiting factor in the Adirondack Mountains. [1]

_____

_____

20. State *one* ecological reason why some individuals might support the reintroduction of wolves to the Adirondacks. [1]

_____

_____

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Part D Questions

_____21. In preparation for an electrophoresis procedure, enzymes are added to DNA to
(1) convert the DNA into gel
(2) cut the DNA into fragments
(3) change the color of the DNA
(4) produce longer sections of DNA

_____22. Paper chromatography is a laboratory technique that is used to
(1) separate different molecules from one another
(2) stain cell organelles
(3) indicate the pH of a substance
(4) compare relative cell sizes

_____23. A marathon runner frequently experiences muscle cramps while running. If he stops running and rests, the cramps eventually go away. The cramping in the muscles most likely results from
(1) lack of adequate oxygen supply to the muscle
(2) the runner running too slowly
(3) the runner warming up before running
(4) increased glucose production in the muscle

Base your answers to questions 24 through 26 on the information below and on your knowledge of biology.

"A series of investigations was performed on four different plant species. The results of these investigations are recorded in the data table below."

Characteristics of Four Plant Species

Plant Species	Seeds	Leaves	Pattern of Vascular Bundles (structures in stem)	Type of Chlorophyll Present
A	round/small	needle-like	scattered bundles	chlorophyll a and b
B	long/pointed	needle-like	circular bundles	chlorophyll a and c
C	round/small	needle-like	scattered bundles	chlorophyll a and b
D	round/small	needle-like	scattered bundles	chlorophyll b

24. Based on these data, which *two* plant species appear to be most closely related? Support your answer. [1]
Plant species _____ and _____

_____

_____

25. What additional information could be gathered to support your answer to question 71? [1]
_____

_____

26. State *one* reason why scientists might want to know if two plant species are closely related.
_____

_____