Name_____ Date Due_____

Regents Review Assignment #7-JA09 Living Environment: Comet 2010-2011

## Part A Questions

_____1. In an area of Indonesia where the ocean floor is littered with empty coconut shells, a species of octopus has been filmed "walking" on two of its eight tentacles. The remaining six tentacles are wrapped around its body. Scientists suspect that, with its tentacles arranged this way, the octopus resembles a rolling coconut. Local predators, including sharks, seem not to notice the octopus as often when it behaves in this manner. This unique method of locomotion has lasted over many generations due to

(1) competition between octopuses and their predators
(2) ecological succession in marine habitats
(3) the process of natural selection
(4) selective breeding of this octopus species

_____2. German measles is a disease that can harm an embryo if the mother is infected in the early stages of pregnancy because the virus that causes German measles is able to

(1) be absorbed by the embryo from the mother's milk
(2) be transported to the embryo in red blood cells
(3) pass across the placenta
(4) infect the eggs

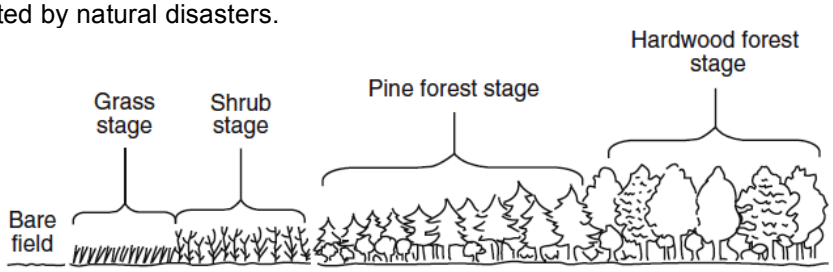
_____3. In 1995, during an Ebola virus outbreak, approximately 80% of the infected individuals died. Which statement is an inference that could be made based on this information?

(1) The individuals who survived were able to produce antibodies against the Ebola virus.
(2) The individuals who survived were not exposed to the Ebola antigens.
(3) Eighty percent of the population had a natural immunity to the Ebola virus.
(4) Eighty percent of the population was infected with a viral antigen.

_____4. The ivory-billed woodpecker, long thought to be extinct, was recently reported to be living in a southern swamp area. The most ecologically appropriate way to ensure the natural survival of this population of birds is to

(1) feed them daily with corn and other types of grain
(2) destroy their natural enemies and predators
(3) move the population of birds to a zoo
(4) limit human activities in the habitat of the bird

_____5. The diagram below represents a biological process taking place in an area of New York State unaffected by natural disasters.




Which statement correctly describes a stage in this process?

(1) The grass stage is the most stable stage and exists for thousands of years.
(2) The shrub stage modifies the ecosystem, making it more suitable for the pine forest.
(3) The pine forest stage has no biodiversity and the least competition.
(4) The hardwood forest stage will be replaced by a pine forest.

_____6. Which human activity is correctly paired with its likely future consequence?

(1) overfishing in the Atlantic — increase in supply of flounder and salmon as food for people
(2) development of electric cars or hybrid vehicles — increased rate of global warming
(3) use of fossil fuels — depletion of underground coal, oil, and natural gas supplies
(4) genetically engineering animals — less food available to feed the world's population

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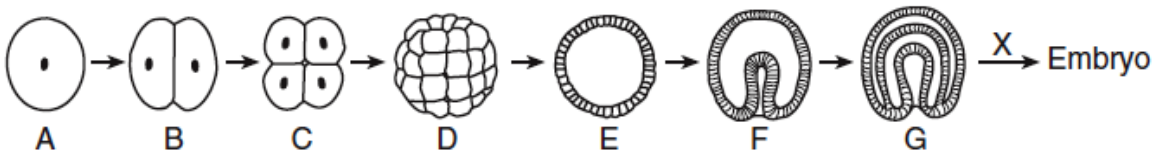
## Part B-1 Questions

Base your answers to questions 7 through 9 on the diagram below, which represents some stages in the development of an embryo, and on your knowledge of biology.



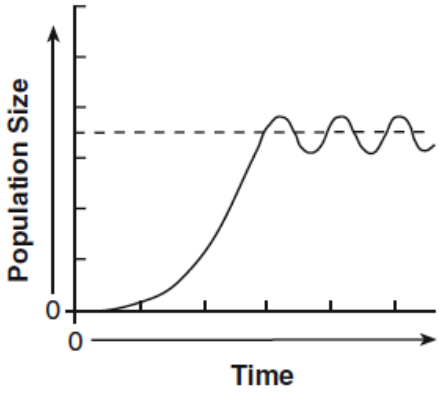

_____7. This entire sequence (*A* through embryo) started with
(1) the periodic shedding of a thickened uterine lining
(2) mitotic cell division in a testis
(3) meiotic cell division in the placenta
(4) the process of fertilization

_____8. If cell *A* has 46 chromosomes, how many chromosomes will most likely be found in each cell of stage *G*?
(1) 23 (3) 69
(2) 46 (4) 92

_____9. The arrow labeled *X* represents the process of
(1) meiosis (3)differentiation
(2) recombination (4) cloning

_____10. A scientist was investigating why a particular tree species grows only in a specific environment. To determine physical conditions the tree species needs to survive, an appropriate study should include
(1) the identification of organisms in the food web in that environment
(2) an analysis of the arrangement of the leaves on the trees
(3) the identification of all tree species in the area
(4) an analysis of the soil around the tree

The graph shows the changes in the size of a fish population over a period of time.




_____11. The dashed line on the graph represents the
(1) carrying capacity of the environment
(2) life span of the species
(3) level at which extinction is reached
(4) level of maximum biodiversity of the species

_____12. The direct source of ATP for the development of a fetus is
(1) a series of chemical activities that take place in the mitochondria of fetal cells
(2) a series of chemical activities that take place in the mitochondria of the uterine cells
(3) the transport of nutrients by the cytoplasm of the stomach cells of the mother
(4) the transport of nutrients by the cytoplasm of the stomach cells of the fetus

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## Part B-2 Questions

Base your answers to questions 13 through 15 on the passage below and on your knowledge of biology.

**Overstaying Their Welcome: Cane Toads in Australia**

Everyone in Australia is in agreement that the cane toads have got to go. The problem is getting rid of them. Cane toads, properly known as *Bufo marinus*, are the most notorious of what are called invasive species in Australia and beyond. But unlike other species of the same classification, cane toads were intentionally introduced into Australia. The country simply got much more and much worse than it bargained for. Before 1935, Australia did not have any toad species of its own. What the country did have, however, was a major beetle problem. Two species of beetles in particular, French's Cane Beetle and the Greyback Cane Beetle, were in the process of decimating [destroying] the northeastern state of Queenland's sugar cane crops. The beetle's larvae were eating the roots of the sugar cane and stunting, if not killing, the plants. The anticipated solution to this quickly escalating problem came in the form of the cane toad. After first hearing about the amphibians in 1933 at a conference in the Caribbean, growers successfully lobbied to have the cane toads imported to battle and hopefully destroy the beetles and save the crops.… The plan backfired completely and absolutely. As it turns out, cane toads do not jump very high, only about two feet actually, so they did not eat the beetles that for the most part lived in the upper stalks of cane plants. Instead of going after the beetles, as the growers had planned, the cane toads began going after everything else in sight— insects, bird's eggs and even native frogs. And because the toads are poisonous, they began to kill would-be predators. The toll on native species has been immense.…

Source: Tina Butler, mongabay.com, April 17, 2005

13. State *one* reason why the cane toads were imported to Australia. [1]

_____

_____

14. Identify *one* adaptation of toads that made them successful in their new environment. [1]

_____

_____

15. State *one* specific example of how the introduction of the cane toads threatened biodiversity in Australia. [1]

_____

_____

16. Complete the chart below by identifying *two* cell structures involved in protein synthesis and stating how *each* structure functions in protein synthesis. [2]

| Cell Structure | Function in Protein Synthesis |
|---|---|
| | |
| | |

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## Part C Questions

17. Many plants can affect the growth of other plants near them. This can occur when one plant produces a chemical that affects another plant.

Design an experiment to determine if a solution containing ground-up goldenrod plants has an effect on the growth of radish seedlings. In your experimental design be sure to:
• state a hypothesis to be tested [1]
• describe how the experimental group will be treated differently from the control group [1]
• explain why the number of seedlings used for the experiment should be large [1]
• identify the type of data that will be collected [1]
• describe experimental results that would support your hypothesis [1]

_____

_____

_____

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_____

Base your answers to questions 18 and 19 on the information below and on your knowledge of biology.

A biologist at an agriculture laboratory is asked to develop a better quality blueberry plant. He is given plants that produce unusually large blueberries and plants that produce very sweet blueberries.

18. Describe *one* way the biologist could use these blueberry plants to develop a plant with blueberries that are both large and sweet. [1]

_____

_____

19. The biologist is successful in producing the new plant. State *one* method that can be used to produce many identical blueberry plants of this new type. [1]

_____

_____

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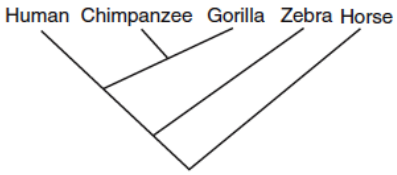
## Part D Questions

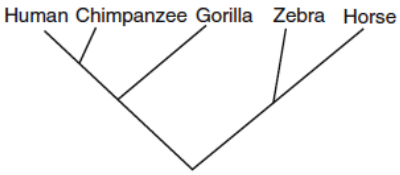
Base your answer to question 20 on the chart below and on your knowledge of biology.

| Species | Sequence of Four Amino Acids Found in the Same Part of the Hemoglobin Molecule of Species |
|---|---|
| human | Lys–Glu–His–Phe |
| horse | Arg–Lys–His–Lys |
| gorilla | Lys–Glu–His–Lys |
| chimpanzee | Lys–Glu–His–Phe |
| zebra | Arg–Lys–His–Arg |

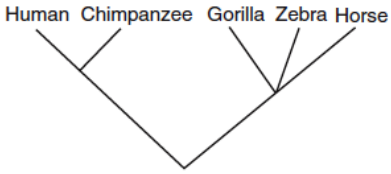
_____20. Which evolutionary tree best represents the information in the chart?



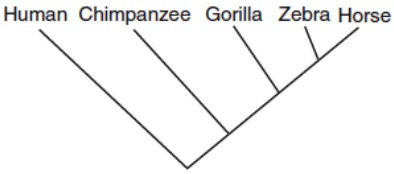

( 1 )




( 3 )




( 2 )




( 4 )

Base your answers to questions 21 and 22 on the diagram below that illustrates the results of a laboratory technique and on your knowledge of biology.

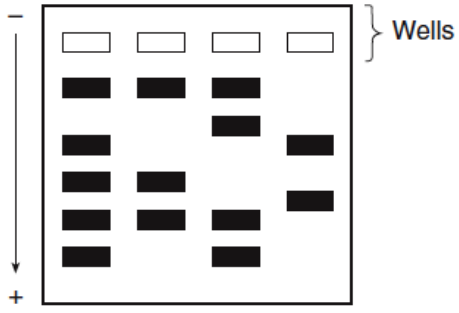
21. State *one* way the information obtained by this technique can be used. [1]

_____

_____

_____

_____




_____22. The results of which laboratory technique are represented in the diagram?

(1) chromatography (2) manipulation of genes

(3) genetic engineering (4) gel electrophoresis