*Name: _____

Mixed Topics #1

A. Genes are inherited, but their expressions can be modified by the environment. This statement explains why

(1) some animals have dark fur only when the temperature is within a certain range
(2) offspring produced by means of sexual reproduction look exactly like their parents
(3) identical twins who grow up in different homes have the same characteristics
(4) animals can be cloned, but plants cannot

B. Molecule *X* moves across a cell membrane by diffusion. Which row in the chart below best indicates the relationship between the relative concentrations of molecule *X* and the use of ATP for diffusion?

Row	Movement of Molecule X	Use of ATP
(1)	high concentration → low concentration	used
(2)	high concentration → low concentration	not used
(3)	low concentration → high concentration	used
(4)	low concentration → high concentration	not used

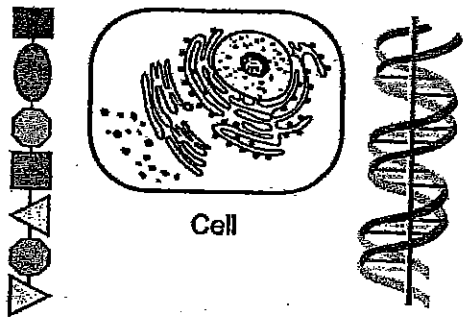
C. Which statement best compares a multicellular organism to a single-celled organism?

(1) A multicellular organism has organ systems that interact to carry out life functions, while a single-celled organism carries out life functions without using organ systems.
(2) A single-celled organism carries out fewer life functions than each cell of a multicellular organism.
(3) A multicellular organism always obtains energy through a process that is different from that used by a single-celled organism.
(4) The cell of a single-celled organism is always much larger than an individual cell of a multicellular organism.

D. Which statement indicates that different parts of the genetic information are used in different kinds of cells, even in the same organism?

(1) The cells produced by a zygote usually have different genes.
(2) As an embryo develops, various tissues and organs are produced.
(3) Replicated chromosomes separate during gamete formation.
(4) Offspring have a combination of genes from both parents.

Three structures are represented in the diagram below.



E. What is the relationship between these three structures?

(1) DNA is made up of proteins that are synthesized in the cell.
(2) Protein is composed of DNA that is stored in the cell.
(3) DNA controls the production of protein in the cell.
(4) The cell is composed only of DNA and protein.

F. In a group of mushrooms exposed to a poisonous chemical, only a few of the mushrooms survived. The best explanation for the resistance of the surviving mushrooms is that the resistance

(1) was transmitted to the mushrooms from the poisonous chemical
(2) resulted from the presence of mutations in the mushrooms
(3) was transferred through the food web to the mushrooms
(4) developed in response to the poisonous chemical

G. In an environment that undergoes frequent change, species that reproduce sexually may have an advantage over species that reproduce asexually because the sexually reproducing species produce

(1) more offspring in each generation
(2) identical offspring
(3) offspring with more variety
(4) new species of offspring in each generation

H. Mutations that occur in skin or lung cells have little effect on the evolution of a species because mutations in these cells

(1) usually lead to the death of the organism
(2) cannot be passed on to offspring
(3) are usually beneficial to the organism
(4) lead to more serious mutations in offspring

Name: _____ Mixed Topics #2

4. The teeth of carnivores are pointed and are good for puncturing and ripping flesh. The teeth of herbivores are flat and are good for grinding and chewing. Which statement best explains these observations?

(1) Herbivores have evolved from carnivores.
(2) Carnivores have evolved from herbivores.
(3) The two types of teeth most likely evolved as a result of natural selection.
(4) The two types of teeth most likely evolved as a result of the needs of an organism.

B. What would most likely happen if most of the bacteria and fungi were removed from an ecosystem?

(1) Nutrients resulting from decomposition would be reduced.
(2) Energy provided for autotrophic nutrition would be reduced.
(3) The rate of mutations in plants would increase.
(4) Soil fertility would increase.

C. A certain bacterial colony originated from the division of a single bacterial cell. Each cell in this colony will most likely

(1) express adaptations unlike those of the other cells
(2) replicate different numbers of genes
(3) have a resistance to different antibiotics
(4) synthesize the same proteins and enzymes

D. An enzyme known as rubisco enables plants to use large amounts of carbon dioxide. This enzyme is most likely active in the

(1) nucleus
(2) vacuoles
(3) mitochondria
(4) chloroplasts

E. Starch molecules present in a maple tree are made from materials that originally entered the tree from the external environment as

(1) enzymes
(2) simple sugars
(3) amino acids
(4) inorganic compounds

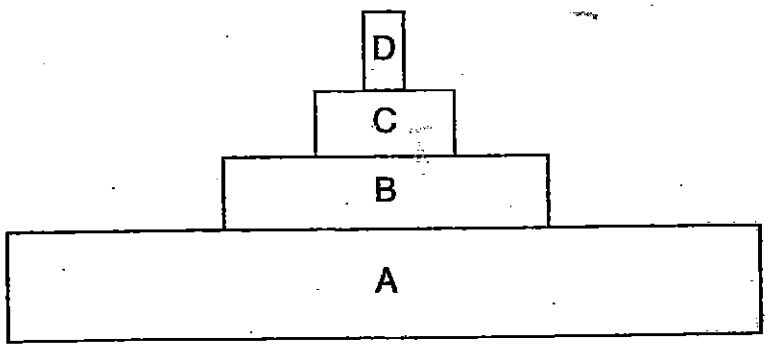
F. Which change in a sample of pond water could indicate that heterotrophic microbes were active?

(1) increase in ozone level
(2) increase in glucose level
(3) decrease in oxygen level
(4) decrease in carbon dioxide level

G. Some human white blood cells help destroy pathogenic bacteria by

(1) causing mutations in the bacteria
(2) engulfing and digesting the bacteria
(3) producing toxins that compete with bacterial toxins
(4) inserting part of their DNA into the bacterial cells

An energy pyramid is represented below.



H. How much energy would be available to the organisms in level *C*?

(1) all of the energy in level *A*, plus the energy in level *B*
(2) all of the energy in level *A*, minus the energy in level *B*
(3) a percentage of the energy contained in level *B*
(4) a percentage of the energy synthesized in level *B* and level *D*