

Living Environment Quiz Review

Cell Structures and Heredity

1. Cells that develop from a single zygote all contain identical DNA molecules. However, some of these cells will develop differently because
 - different groups of cells containing the DNA may be exposed to different environmental conditions
 - only the DNA in certain cells will replicate
 - some of the DNA in some of the cells will be removed by chemical reactions
 - DNA is functional in only 10% of the cells of the body
2. In the leaf of a plant, guard cells help to
 - destroy atmospheric pollutants when they enter the plant
 - regulate oxygen and carbon dioxide levels
 - transport excess glucose to the roots
 - block harmful ultraviolet rays that can disrupt chlorophyll production
3. Mustard gas removes guanine (G) from DNA. For developing embryos, exposure to mustard gas can cause serious deformities because guanine
 - stores the building blocks of proteins
 - supports the structure of ribosomes
 - produces energy for genetic transfer
 - is part of the genetic code
4. Damage to which structure will most directly disrupt water balance within a single-celled organism?
 - ribosome
 - cell membrane
 - nucleus
 - chloroplast
5. A mutation that can be inherited by offspring would result from

- random breakage of chromosomes in the nucleus of liver cells
 - a base substitution in gametes during meiosis
 - abnormal lung cells produced by toxins in smoke
 - ultraviolet radiation damage to skin cells
6. Compared to human cells resulting from mitotic cell division, human cells resulting from meiotic cell division would have
- twice as many chromosomes
 - the same number of chromosomes
 - one-half the number of chromosomes
 - one-quarter as many chromosomes
7. Chromosomes can be described as
- large molecules that have only one function
 - folded chains of bonded glucose molecules
 - reproductive cells composed of molecular bases
 - coiled strands of genetic material
8. Which structures carry out life functions within cells?
- tissues
 - organ systems
 - organelles
 - organs
9. A boy inherits genes for tallness, but his growth is limited as a result of poor nutrition. This is an example of
- an inherited disorder
 - environmental influence on gene expression
 - expression of a hidden trait
 - a characteristic controlled by more than one pair of genes
10. The sickle-cell trait is an inherited condition resulting from the presence of abnormal molecules of the protein hemoglobin in red blood cells. A person with the sickle-cell trait

may have a child with the same condition
because the child receives from the parent

- abnormal red blood cells
- abnormal hemoglobin molecules
- a code for the production of abnormal hemoglobin
- a code for the production of abnormal amino acids

11. Which statement is true regarding an alteration or change in DNA?

- It is always known as a mutation
- It is always advantageous to an individual
- It is always passed on to offspring
- It is always detected by the process of chromatography

12. People with cystic fibrosis inherit defective genetic information and cannot produce normal CFTR proteins. Scientists have used gene therapy to insert normal DNA segments that code for the missing CFTR protein into the lung cells of people with cystic fibrosis. Which statement does not describe a result of this therapy?

- Altered lung cells can produce the normal CFTR protein
- Altered lung cells can divide to produce other lung cells with the normal CFTR gene
- The normal CFTR gene may be expressed in altered lung cells
- Offspring of someone with altered lung cells will inherit the normal CFTR gene

13. In several species of birds, the males show off their bright colors and long feathers. The dull-colored females usually pick the brightest colored males for mates. Male offspring inherit their father's bright colors and long feathers. Compared to earlier generations, future generations of these birds will be expected to have a greater proportion of

- bright-colored females
- dull-colored females
- dull-colored males
- bright-colored males

14. During meiosis, crossing-over (gene exchange between chromosomes) may occur. Crossingover usually results in
- overproduction of gametes
 - fertilization and development
 - the formation of identical offspring
 - variation within the species
15. The DNA of a human cell can be cut and rearranged by using
- a scalpel
 - electrophoresis
 - hormones
 - enzymes
16. The transfer of genes from parents to their offspring is known as
- differentiation
 - heredity
 - immunity
 - evolution
17. Individual cells can be isolated from a mature plant and grown with special mixtures of growth hormones to produce a number of genetically identical plants. This process is known as
- cloning
 - meiotic division
 - recombinant DNA technology
 - selective breeding
18. Although identical twins inherit exact copies of the same genes, the twins may look and act differently from each other because
- a mutation took place in the gametes that produced the twins
 - the expression of genes may be modified by environmental factors
 - the expression of genes may be different in males and females
 - a mutation took place in the zygote that produced the twins

19. When DNA separates into two strands, the DNA would most likely be directly involved in
- replication
 - fertilization
 - differentiation
 - evolution
20. A change in the order of DNA bases that code for a respiratory protein will most likely cause
- the production of a starch that has a similar function
 - the digestion of the altered gene by enzymes
 - a change in the sequence of amino acids determined by the gene
 - the release of antibodies by certain cells to correct the error
21. A sudden change in the DNA of a chromosome can usually be passed on to future generations if the change occurs in a
- skin cell
 - liver cell
 - sex cell
 - brain cell
22. Although all of the cells of a human develop from one fertilized egg, the human is born with many different types of cells. Which statement best explains this observation?
- Developing cells may express different parts of their identical genetic instructions
 - Mutations occur during development as a result of environmental conditions
 - All cells have different genetic material
 - Some cells develop before other cells
23. What determines the kind of genes an organism possesses?
- type of amino acids in the cells of the organism
 - sequence of the subunits A, T, C, and G in the DNA of the organism
 - size of simple sugar molecules in the organs of the organism
 - shape of the protein molecules in the organelles of the organism

24. The human liver contains many specialized cells that secrete bile. Only these cells produce bile because
- different cells use different parts of the genetic information they contain
 - cells can eliminate the genetic codes that they do not need
 - all other cells in the body lack the genes needed for the production of bile
 - these cells mutated during embryonic development
25. A human liver cell and a human skin cell in the same person have the same genetic sequences. However, these cells are different because the liver cell
- has more dominant traits than the skin cell
 - can reproduce but the skin cell cannot
 - carries out respiration but the skin cell does not
 - uses different genes than the skin cell
26. The sorting and recombining of genes during meiosis and fertilization usually leads to the production of
- gametes with many copies of the same chromosome
 - embryos with traits identical to those of all other members of the species
 - zygotes with the genetic information to produce only females
 - offspring with some traits that did not appear in their parents
27. Nerve cells are essential to an animal because they directly provide
- communication between cells
 - transport of nutrients to various organs
 - regulation of reproductive rates within other cells
 - an exchange of gases within the body
28. Which statement describes starches, fats, proteins, and DNA?
- They are used to store genetic information
 - They are complex molecules made from smaller molecules
 - They are used to assemble larger inorganic materials
 - They are simple molecules used as energy sources

29. The respiratory system includes a layer of cells in the air passages that clean the air before it gets to the lungs. This layer of cells is best classified as

- a tissue
- an organ
- an organelle
- an organ system

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