Honors Biology **Mr. Dang**

Name _____ Period _____ Date _____

Final Exam
Review #3

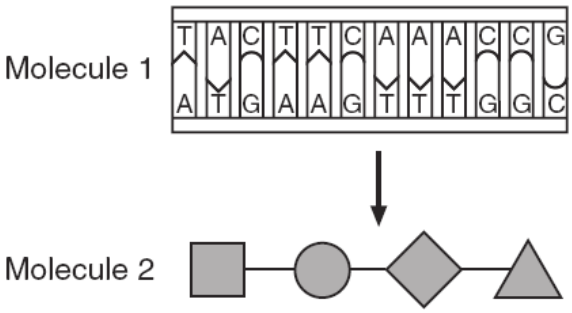
1. The current knowledge concerning cells is the result of the investigations and observations of many scientists. The work of these scientists forms a well-accepted body of knowledge about cells. This body of knowledge is an example of a

(1) hypothesis
(2) controlled experiment
(3) theory
(4) research plan

2. A human zygote is produced from gametes that are usually identical in

(1) the expression of encoded information
(2) the number of altered genes present
(3) chromosome number
(4) cell size

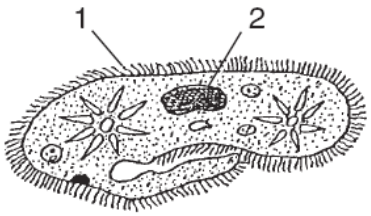
3. Molecule 1 represents a segment of hereditary information, and molecule 2 represents the portion of a molecule that is determined by information from molecule 1.



What will most likely happen if there is a change in the first three subunits on the upper strand of molecule 1?

(1) The remaining subunits in molecule 1 will also change.
(2) A portion of molecule 2 may be different.
(3) Molecule 1 will split apart, triggering an immune response.
(4) Molecule 2 may form two strands rather than one.

4. The diagram below shows two different structures, 1 and 2, that are present in many single-celled organisms. Structure 1 contains protein *A*, but not protein *B*, and structure 2 contains protein *B*, but not protein *A*.



Which statement is correct concerning protein *A* and protein *B*?

(1) Proteins *A* and *B* have different functions and different amino acid chains.
(2) Proteins *A* and *B* have different functions but the same amino acid chains.
(3) Proteins *A* and *B* have the same function but a different sequence of bases (A, C, T, and G).
(4) Proteins *A* and *B* have the same function and the same sequence of bases (A, C, T, and G).

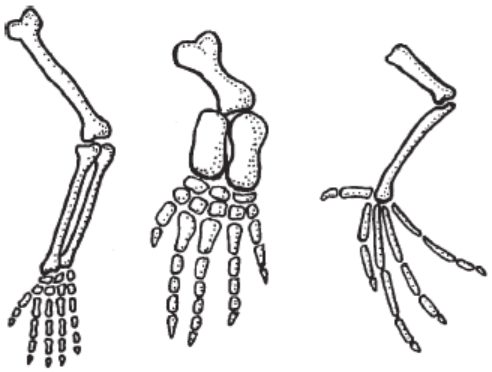
5. Which process is a common practice that has been used by farmers for hundreds of years to develop new plant and animal varieties?

(1) cloning
(2) genetic engineering
(3) cutting DNA and removing segments
(4) selective breeding for desirable traits

6. Which statement represents the major concept of the biological theory of evolution?

(1) A new species moves into a habitat when another species becomes extinct.
(2) Every period of time in Earth's history has its own group of organisms.
(3) Present-day organisms on Earth developed from earlier, distinctly different organisms.
(4) Every location on Earth's surface has its own unique group of organisms.

7. The diagrams below show the bones in the forelimbs of three different organisms.



Differences in the bone arrangements support the hypothesis that these organisms

(1) are members of the same species
(2) may have descended from the same ancestor
(3) have adaptations to survive in different environments
(4) all contain the same genetic information

8. Which situation would most likely result in the highest rate of natural selection?

(1) reproduction of organisms by an asexual method in an unchanging environment
(2) reproduction of a species having a very low mutation rate in a changing environment
(3) reproduction of organisms in an unchanging environment with little competition and few predators
(4) reproduction of organisms exhibiting genetic differences due to mutations and genetic recombinations in a changing environment

9. Which relationship best describes the interactions between lettuce and a rabbit?

(1) predator — prey
(2) producer — consumer
(3) parasite — host
(4) decomposer — scavenger

10. An organism takes materials from its environment and processes them for its use. This statement best describes the life function known as

1 transport
2 excretion
3 nutrition
4 regulation

11. Which structures could most likely be observed in cells in the low-power field of a compound light microscope?

1 cell walls and chloroplasts
2 ribosomes and endoplasmic reticula
3 lysosomes and genes
4 nucleotides and mitochondria

12. What would most likely happen if the ribosomes in a cell were not functioning?

1 The cell would undergo uncontrolled mitotic cell division.
2 The synthesis of enzymes would stop.
3 The cell would produce antibodies.
4 The rate of transport of glucose in the cytoplasm would increase.

13. Most of the chemical reactions occurring in a living cell depend on the presence of an inorganic compound known as

1 glycerol
2 glycogen
3 maltose
4 water

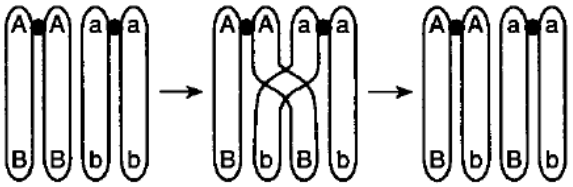
14. In guinea pigs, black fur (*B*) is dominant over white fur (*b*) and rough fur (*R*) is dominant over smooth fur (*r*). A cross between two guinea pigs hybrid for both traits (*BbRr* × *BbRr*) produces some offspring that have rough, black fur and some that have smooth, black fur. The genotypes of these offspring illustrate the genetic concept of

1 intermediate inheritance
2 independent assortment
3 multiple alleles
4 codominance

15. Which statement describes the work of Gregor Mendel?

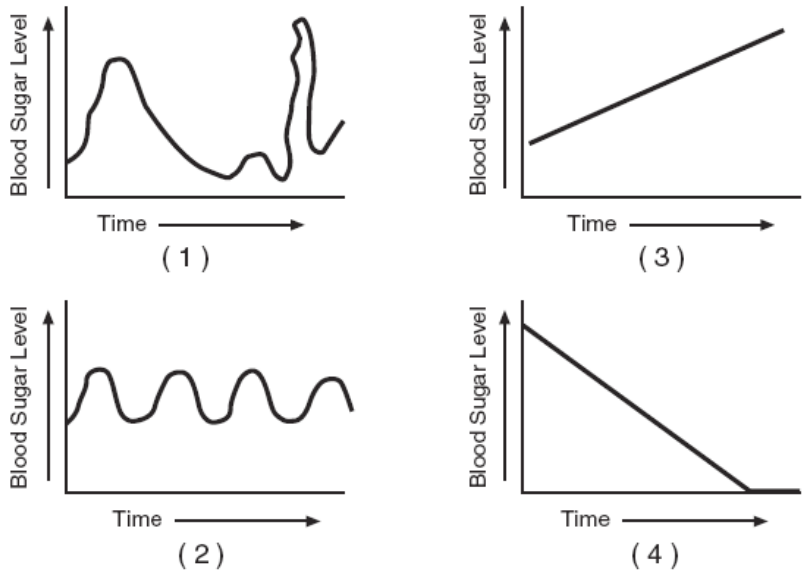
1 He developed some basic principles of heredity without having knowledge of chromosomes.
2 He explained the principle of dominance on the basis of the gene-chromosome theory.
3 He developed the microscope for the study of genes in pea plants.
4 He used his knowledge of gene mutations to help explain the appearance of new traits in organisms.

16. Which statement best describes the process illustrated in the diagram below?



1 Nondisjunction occurs during segregation, resulting in a chromosomal mutation.
2 Crossing-over occurs during synapsis, leading to increased variation.
3 Exposure to mutagenic agents causes gene linkage in nonhomologous chromosomes.
4 Inbreeding causes random breakage and recombination of chromosome parts.

17. Which graph of blood sugar level over a 12-hour period best illustrates the concept of dynamic equilibrium in the body?



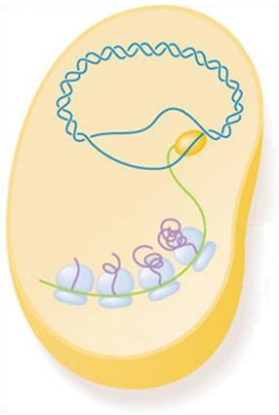
18. Draw lines to match the hydration status of each cell with the correct appearance of the overall plant. In the space provided, write the **term** used to describe the "status" of the middle & right cell based on how hydrated it is.

_____ _____





19. The diagram below depicts gene expression in a prokaryotic or eukaryotic cell? _____



Provide TWO reasons to justify your answer.

Reason 1: _____

_____

_____

Reason 2: _____

_____

_____

20. In the diagram below of a DNA replication bubble, mark with an "X" the region(s) of the bubble that would be replicated in a discontinuous (a.k.a. lagging) fashion.

21. Provide TWO reasons why DNA is replicated in two different ways—continuous and discontinuous.

Reason 1: _____

_____

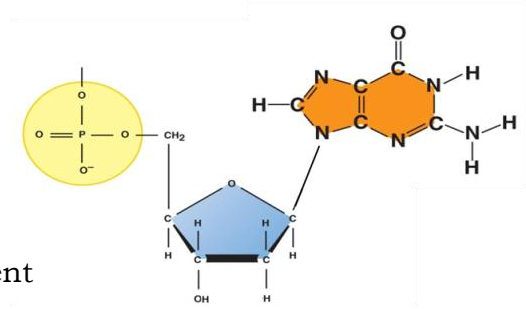
_____

Reason 2: _____

_____

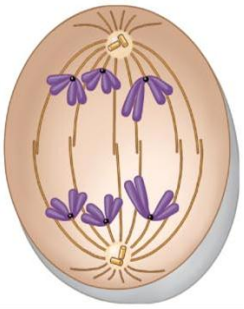
_____

22. Would you expect to find the nucleotide on the right in a DNA or RNA molecule? Circle the region of the molecule to justify your answer. _____



BOX the component(s) of the nucleotide that would represent the backbone (outside "ribbon") of the DNA molecule.

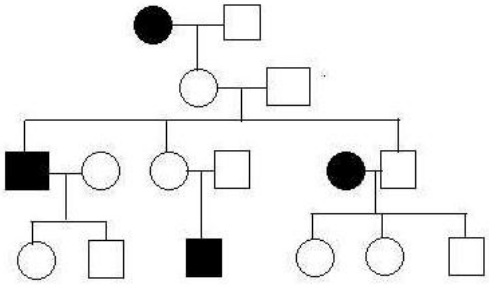
23. Name the phase of the following cell. _____



What is its haploid number? _____

What is its diploid number? _____

24. Determine the offspring, if any, which would disprove the mode of inheritance.



autosomal recessive: _____

autosomal dominant: _____

X-linked recessive: _____

X-linked dominant: _____