FINAL EXAM TEST DO NOT WRITE ON TEST!!

DNA

Multiple Choice

Identify the choice that best completes the statement or answers the question.

____ 1. What letters represent the four bases?
a. A, B, C, D
b. W, X, Y, Z
c. A, T, G, C
d. E, Y, A, O

____ 2. Watson and Crick built a DNA model like a
a. long, twisted ladder.
b. piece of twine.
c. straight line.
d. pyramid.

____ 3. The sides of the DNA "ladder" are made of
a. guanine and thymine.
b. adenine and cytosine.
c. sugar and phosphate.
d. helixes and twists.

____ 4. The "rungs" of the DNA ladder are
a. a pair of bases.
b. a pair of sugars.
c. a pair of phosphates.
d. a set of proteins.

____ 5. To be copied, a DNA molecule splits
a. across the top.
b. down the middle.
c. along the sides.
d. along the phosphates.

____ 6. A string of nucleotides that has instructions for a certain trait is a
a. cell.
b. ribonucleic acid.
c. gene.
d. chromosome.

____ 7. Three bases code for one
a. cell.
b. DNA.
c. protein.
d. amino acid.

____ 8. In what type of mutation is one base left out?
a. substitution
b. deletion
c. insertion
d. cell

____ 9. Which best expresses the relationship between genes and DNA?
a. Genes contain DNA.
b. DNA destroys genes.
c. Both contain chromosomes.
d. They are unrelated.

____ 10. DNA is made of subunits called what?
a. proteins
b. deoxyribonucleic acids
c. traits
d. nucleotides

____ 11. Nucleotides are made of a sugar, a phosphate, and a
a. base.
b. protein.
c. gene.
d. ribosome.

____ 12. What is the type of mutation where a base is added to the gene?
a. deletion
b. substitution
c. insertion
d. ultraviolet

____ 13. Using DNA to identify who committed a crime is
a. genetic engineering.
b. DNA fingerprinting.
c. genetic disease.
d. DNA cloning.

____ 14. Some genetic disorders, such as sickle cell anemia, are due to
a. a ribosome.
b. a mutation.
c. a DNA fingerprint.
d. genetic engineering.

____ 15. The complementary strand to the DNA sequence TAGTCA is
a. ATGAGT.
b. GACAGT.
c. GTAGAT.
d. ATCAGT.

____ 16. What determines how tall you grow and whether your hair is curly or straight?
a. a chromatid
b. RNA
c. proteins
d. ultraviolet radiation

____ 17. Who said that adenine equals thymine in DNA?
a. Rosalind Franklin
b. James Watson
c. Erwin Chargaff
d. Francis Crick

____ 18. Who first found out that DNA has a spiral shape?
a. Rosalind Franklin
b. James Watson
c. Erwin Chargaff
d. Francis Crick

____ 19. What does each gene have instructions for making?
a. a cell
b. a ribosome
c. a protein
d. RNA

____ 20. Where does messenger RNA go?
a. to a protein
b. to a genetic engineer
c. to a ribosome
d. to a chromosome

____ 21. Which is the first step of DNA replication?
a. Two complete, identical strands of DNA pair up.
b. New nucleotides attach to exposed bases.
c. A strand of DNA splits down the middle.
d. Adenine and thymine make a base pair.

____ 22. Which of the following types of cells would have a mutation passed on from generation to generation?
a. body cells
b. blood cells
c. skin cells
d. sex cells

Completion - *Complete each statement.*
Use the terms from the following list to complete the sentences below. Each term may only be used once. Some terms may not be used.

23. DNA is composed of subunits known as _____.
24. Chargaff's rules state that the amount of _____ in DNA is always equal to the amount of guanine.
25. When scientists transfer genes from one organism to another, it is called _____.
26. When sequences of base pairs are copied incorrectly, they are called _____.
27. Examples of chemical _____ include asbestos and chemicals found in cigarette smoke.

a.) mutagens
b.) thymine
c.) mutations
d.) genetic engineering
e.) insertion
f.) nucleotides
g.) ribosome
h.) cytosine

Use the terms from the following list to complete the sentences below.

28. A DNA sequence that reads ATTGCCGAT that after being copied reads ATTGCCAGAT is an example of _____.
29. A DNA sequence that reads ATTGCCCAT that after being copied reads ATTGCCAT is an example of _____.
30. A DNA sequence that reads ATTGCCGAT that after being copied reads ATTGCCCAT is an example of _____.
31. Substitutions, insertions, and deletions can all be caused by a(n) _____.

a.) substitution
b.) insertion
c.) deletion
d.) mutagen

Ordering - *Put the* ***Steps of DNA Copying Itself*** *in order, with* ***A*** being **1st**, **B** being **2nd** and **C** being **3rd.**

32. New, complementary nucleotides attach to exposed bases.

33. A strand of DNA splits down the middle.

34. Two complete, identical strands of DNA pair up.

____35. When is DNA copied?

a. when all the old cells die.
b. at the end of every month.
c. whenever it wants to.
d. every time a cell divides.

____ 36. Which of the following did Erwin Chargaff or Rosalind Franklin not do to contribute to Watson and Crick's model of DNA?

a. they built a double helix model.
b. they used X-ray diffraction showed that DNA had a spiral shape.
c. they found out that Adenine pairs with Thymine and Guanine pairs with Cytosine.
d. they built a microscopic DNA Model.

Arrange the following words in order from smallest part to largest: DNA, nucleotide, chromosome, gene, base. (**with A smallest, B second smallest, C third smallest and D the 2nd largest/ fourth smallest and E the largest**)

37. DNA
38. nucleotide
39. chromosome
40. Gene
41. Base

42. A scientist invents a genetic test that indicates people in some families have a higher risk of a rare disease. Is this an example of

a. DNA fingerprinting
b. Genetic engineering

Mitosis

43. Compare body cells and sex cells.

____44. Which of the following is not a body cell?

a. skin cells
b. sperm
c. a zygote
d. hair follicles

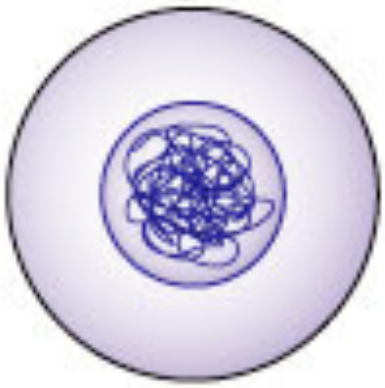
45. Give two examples of a sex cell

46. What stage does the picture below represent?

_____

48. What stage does the picture below represent?

_____

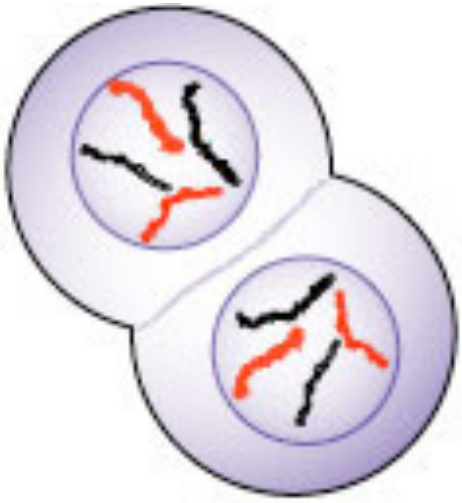


50. What stage does the picture below represent?

_____

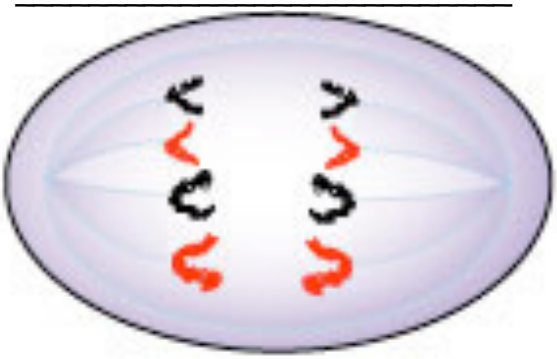
47. What stage does the picture below represent?

_____



49. What stage does the picture below represent?

_____



51. Now, after labeling the phases, put them in order.

Completion

Complete each statement.

Use the terms from the following list to complete the sentences below. Each term may only be used once. Some terms may not be used.

centromere	Meiosis
Mitosis	chromosome
chromatin	zygote
diploid	sister chromatids
Telophase	cytokinesis
embryo	

52. The division of the cytoplasm is called _____ .

53. The _____ holds the sister chromatids together.

54. A _____ is decondensed DNA with a thread-like structure

55. A _____ is condensed DNA with a rod-like structure.

56. _____ are duplicated chromosomes that are held together by the centromere.

57. The division of sex cells is called _____.

58. A _____ is a multicellular human at the beginning of development.

59. A _____ is a single-celled human.

60. _____ cells are cells with the full set of DNA.

61. _____ is the phase of Mitosis when chromosomes decondense and the nucleus reappears.

62. What is the difference between how plant and animal cells divide?

a. In animal cells, a new cell wall is built and in plant cells, the cytoplasm pinches in.
b. In animal cells, the cytoplasm pinches in and in plant cells a new cell wall is built.
c. In animal cells, there are multiple cell divisions in and in plant cells there is only one cell division.
d. In animal cells, there is only one cell division in and in plant cells there are multiple cell divisions.

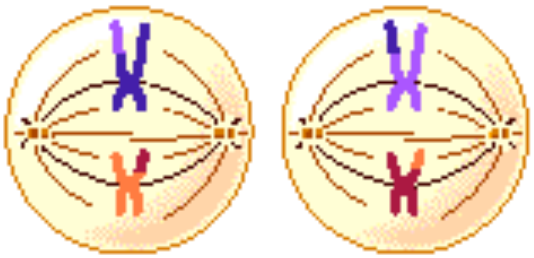
63. What would happen if Cytokinesis occurred without Mitosis?

a. there would be two cytoplasms.
b. each cell would have all of the parent cell's genetic material.
c. each cell would have only half of the parent cell's genetic material.
d. the cytoplasm would get larger.

Meiosis

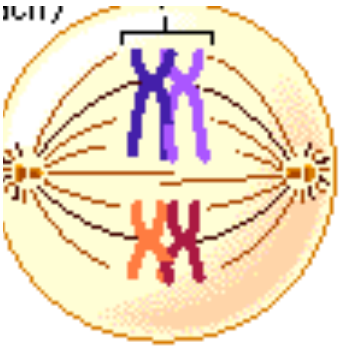
64. What stage does the picture below represent?

_____



65. What stage does the picture below represent?

_____



66. What stage does the picture below represent?

_____

67. What stage does the picture below represent?

_____

68. What stage does the picture below represent?

_____

69. What stage does the picture below represent?

_____

71. What stage does the picture below represent?

_____

72. What stage does the picture below represent?

_____

72. What stage does the picture below represent?

_____

STUDY THE CHART BELOW FOR THE FINAL !!!

Characteristic	Mitosis	Meiosis
Type of cells that divide	Body Cells	Sex Cells
The number of chromosomes before the cell begins to reproduce	The same as the parent cell.	The same as the parent cell.
Metaphase	Sister chromatids line up at the center of the cell.	(Metaphase 1): The homologous Pairs line up at the center of the cell. (Metaphase 2): The sister chromatids line up at the center of the cell.
Anaphase	The sister chromatids separate from their copies.	(Anaphase 1): The homologous pairs separate from each other. (Anaphase 2): The sister chromatids separate from their copies.
Characteristic	**Mitosis**	**Meiosis**
Number of chromosomes in each cell at the end of reproduction.	The same as the parent cell.	Half the amount of the parent cell.
Total Number of Phases	4	8
Number of Daughter Cells Produced	2	4

73. Mitosis
74. Meiosis
75. Chromosome
76. Chromatin
77. Sister chromatids
78. Centromere
79. Spindle fibers
80. Zygote
81. Embryo
82. Homologous chromosomes
83. Diploid
84. Haploid

a) A multicellular human during the beginning of development.
b) Condensed DNA. Appears as rod-like structures.
c) Cells that contain half of the DNA.
d) Cells that contain the full set of DNA.
e) Non-identical chromosomes that contain the same information for the same traits and the same genes.
f) Cell division of body cells.
g) The structures which direct the movement of the chromosomes during Mitosis and Meiosis.
h) Reduction division that produces sex cells.
i) Decondensed DNA. Appears thread-like
j) The duplicated chromosomes that are held together
k) A center which holds together sister chromatids.
l) A single-celled human

Genetics

Matching - Match the Vocabulary word to the definition.

85. Gene
86. Random
87. Variation
88. Dominant Trait
89. Recessive Trait
90. Alleles
91. Dominant allele
92. Recessive allele
93. Genotype
94. Phenotype
95. Homozygous
96. Hetrozygous

a) allele set, genetic makeup of the chromosome.
b) Pure condition, 2 same case alleles, BB = dominant, bb = recessive
c) code for a trait. One from father, one from mother.
d) shows the outward appearance even when the recessive trait is present.
e) upper case letter, codes for dominant trait.
f) outward appearance is masked when a dominant trait is present.
g) a specific location on a chromosome that controls a certain trait.
h) the occurrence of an inherited trait that makes a person or thing different from another within the same species.
i) lower case letter, codes for recessive trait.
j) outward appearance, trait that is shown.
k) nothing is causing one trait to appear more often than another.
l) hybrid condition, two different case alleles. Ex. Bb (would have dominant phenotype)

97. In a pedigree a male is a (circle / square)
98. In a pedigree a female is a (circle / square)
99. In a pedigree affected individuals have (white / shaded) shapes
100. Make an Aa x Aa cross and give the genotypic and phenotypic ratio.

101. Make a Nn x nn cross and giver the genotypic and phenotypic ratios.

102.	Evolution	A.	Process in which living things that are better adapted to their environment are more likely to survive and reproduce.
103.	Variation	B.	When an organism has a variation that makes it better able to survive.
104.	Adaptation	C.	An appearance of an inherited trait or behavior that makes one organism different from the others of the same species.
105.	Selecting Agents	D.	Changes that occur in a population of organism overtime.
106.	Natural Selection	E.	Anything in the environment that affects an organism's chance of survival. Ex. Predators, bacteria, virus, salt content of water and acid level of soil.