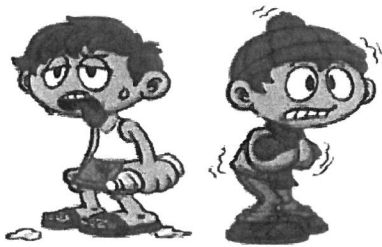
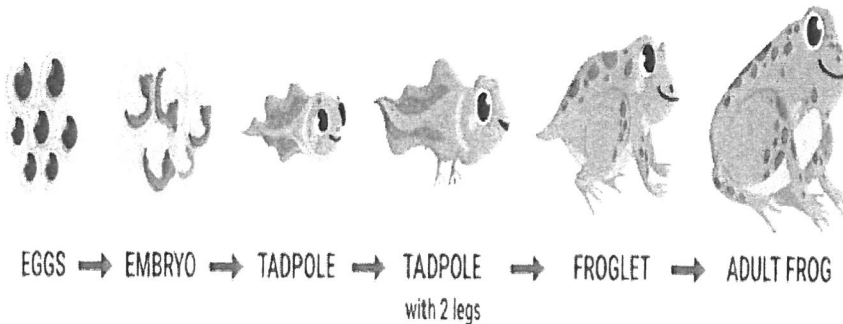


Biology Final Exam

- Biology is the study of _____.
A) animals **C)** the Earth
B) life **D)** science
- The smallest unit of life is _____.
A) an atom **C)** a species
B) a cell **D)** matter
- Which of the following is NOT a characteristic of life?
A) reproduction **C)** energy use
B) homeostasis **D)** movement
- Giraffes contain many cells in their body, so they are _____.
A) autotrophs **C)** multicellular
B) unicellular **D)** abiotic
- Which vocabulary term is illustrated by the image below?

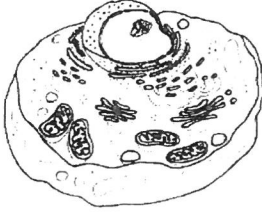


- A)** homeostasis **C)** metabolism
B) evolution **D)** unicellular
- The fire alarm sounded and all the students jumped. This is an example of which characteristic of life?
A) response to stimulus **C)** homeostasis
B) organization/cells **D)** growth and development

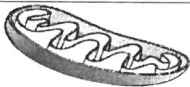


- The diagram above represents which characteristic of life?
A) autotroph **C)** growth and development
B) response to stimuli **D)** prokaryote

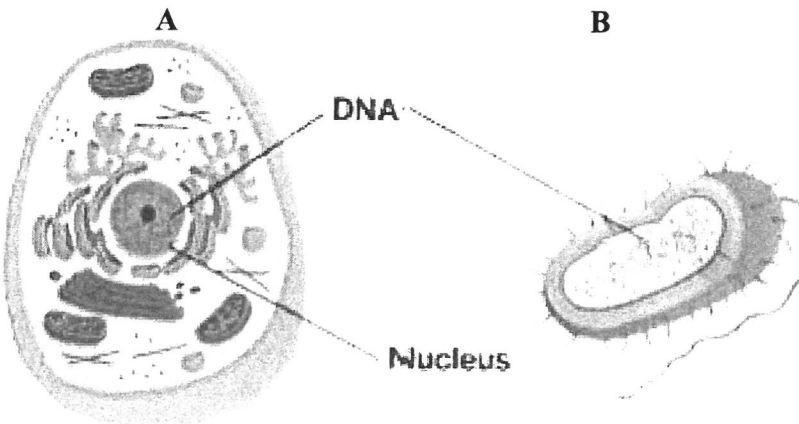
8. The cell pictured below is _____, because it _____.



- A)** a prokaryote; does not have a nucleus **C)** a prokaryote; has a nucleus
B) a eukaryote; does not have a nucleus **D)** a eukaryote; has a nucleus
9. The organelle that contains the cell's DNA is called the _____.
- A)** endoplasmic reticulum **C)** ribosome
B) cytoskeleton **D)** nucleus
10. The **organelle** that is the site of photosynthesis is the _____.
- A)** thylakoid **C)** chlorophyll
B) chloroplast **D)** grana
11. The organelle covered with ribosomes that moves protein is the _____.
- A)** rough ER **C)** chloroplast
B) nucleus **D)** smooth ER
12. Which of the following organelles would be found in the cells of a tree and grass, but would not be found in the cells of a dog or elephant?
- A)** mitochondria **C)** chloroplast
B) ribosomes **D)** cell membrane
13. Cellular Respiration produces **energy/ATP** for cells in the organelle pictured below. The organelle is _____.

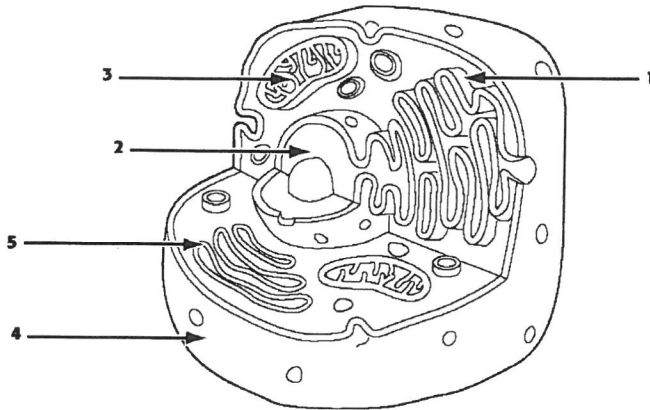


- A)** found only in prokaryotes **C)** found in both plant and animal cells
B) found only in animal cells **D)** found only in plant cells
14. Which statement about the cells below is correct?



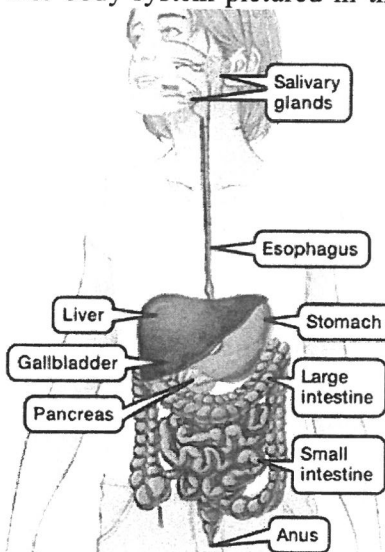
- A)** Cell B is probably a bacteria cell. **C)** Cell A is an animal cell, and Cell B is a plant cell.
B) Cells A and B are both eukaryotes **D)** Cells A and B are both prokaryotes.

15.



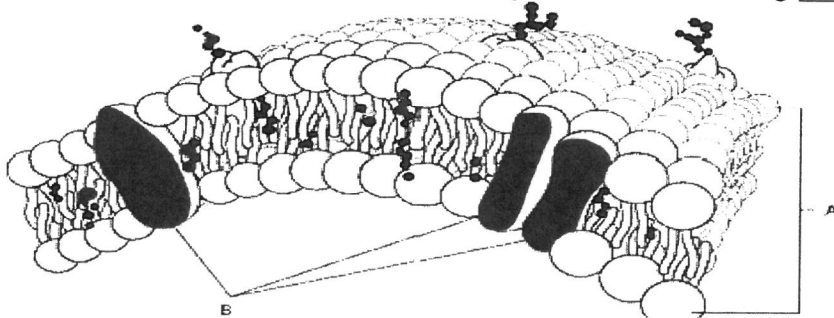
Refer to the illustration above. The cell shown is probably an animal cell because

- A)** it does not have a cell wall. **C)** it does not have a nucleus.
B) it has a cell membrane. **D)** it has mitochondria.
- 16.** The cell organelle that stores water, waste and nutrients in plants is the _____.
A) mitochondria **C)** central vacuole
B) nucleus **D)** cell wall
- 17.** Which of the following statements is true?
A) Plants and animals both have cell walls and cell membranes. **C)** Animals have a cell membrane, but plants do not.
B) Plants have a cell membrane, but animals do not. **D)** Plants and animals both have cell membranes.
- 18.** The function of the immune system is to _____.
A) exchange gases **C)** help you move
B) give you structure and support **D)** protect you from illness
- 19.** The body system pictured in the diagram below is the _____.



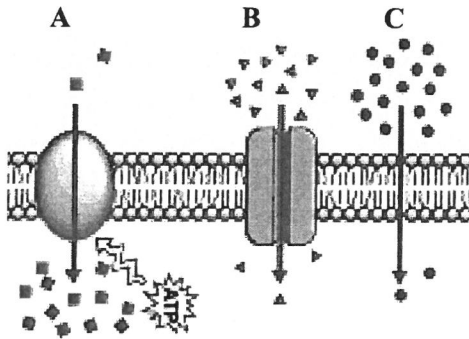
- A)** integumentary system **C)** digestive system
B) endocrine system **D)** circulatory system

20. Mr. Lowe is looking at a slide under the microscope, but the image is too bright and hurts his eyes. What should he adjust to make the image darker?
A) diaphragm **C)** fine adjustment knob
B) coarse adjustment knob **D)** low power objective
21. Which part of the microscope will bring an image into clear focus under **high** power?
A) diaphragm **C)** low power objective
B) coarse adjustment knob **D)** fine adjustment knob
22. A microscope has a 10X eyepiece and a 50X objective, what is the **total magnification**?
A) 15X **C)** 500X
B) 50X **D)** 10X
23. The building block/monomer of carbohydrates is _____.
A) nucleotides **C)** amino acids
B) monosaccharides **D)** glycerol and fatty acids
24. The cell membrane has the property of _____, which means that some but not all substances pass through it.
A) fluid mosaic model **C)** selective permeability
B) dynamic equilibrium **D)** adhesion
25. Which phrase best describes passive transport?
A) it is only used to move molecules into the cell
B) it requires no energy from the cell
C) it is only used to move molecules out of the cell
D) it moves molecules from low concentration to high concentration
26. The letter "A" on the right side of the diagram below is showing _____.

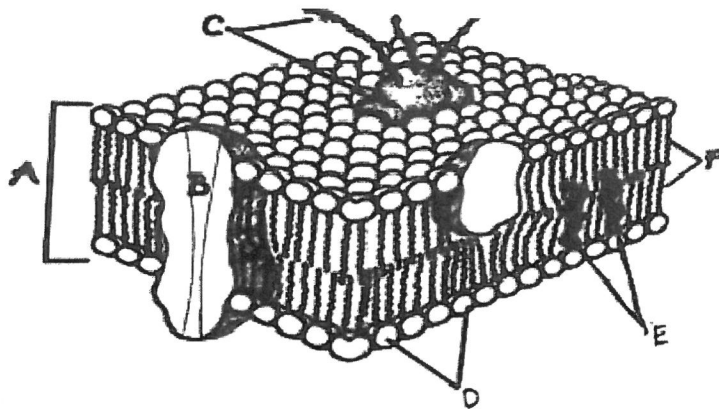


- A)** carbohydrates **C)** the phospholipid bilayer
B) a cholesterol molecule **D)** ligands
- 27.** What is the term for the diffusion of **WATER** across a cell membrane toward an area where there is more solute (salt)?
A) endocytosis **C)** osmosis
B) exocytosis **D)** active transport

28. The molecules below labeled "A" are crossing the cell membrane using _____.



- A) osmotic diffusion C) facilitated diffusion
B) active transport D) simple diffusion

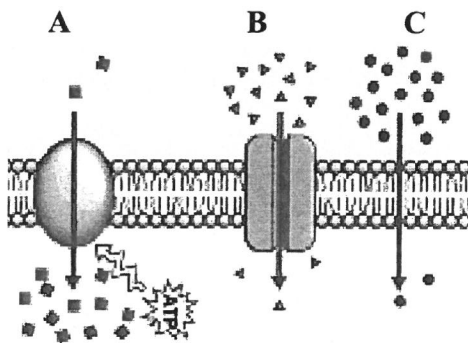


29.

The cell membrane bilayer (structure A) is made of which macromolecule?

- A) nucleic acid C) lipid
B) protein D) carbohydrate

30. The molecules below labeled "B" are crossing the cell membrane using _____.

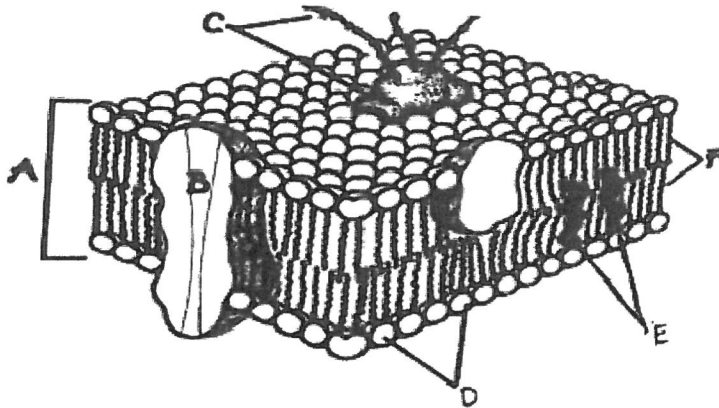


- A) exocytosis C) active transport
B) simple diffusion D) facilitated diffusion

31. You are stranded in the Atlantic Ocean, and, being thirsty, you drink the surrounding seawater. As a result,

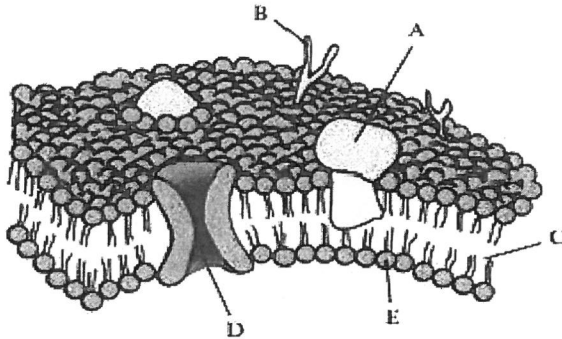
- A) you satisfy/quench your thirst. C) your cells burst and die due to the excessive intake of salt.
B) your cells become swollen. D) you dehydrate yourself.

32. Structure "B" in the diagram below is _____.



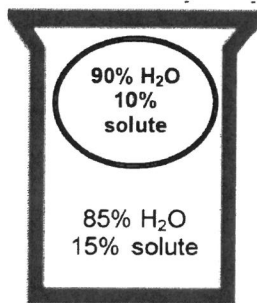
- A) a carbohydrate
B) a phospholipid
C) a protein
D) a cholesterol

33. Which structure in the diagram below is hydrophobic?



- A) structure B
B) structure C
C) structure A
D) structure E

34. The cell shown in the beaker will _____.



- A) shrink as water moves into it
B) swell as water moves out of it
C) shrink as water moves out of it
D) swell as water moves into it

35. A beaker has a liquid in it that is **hypotonic** to the cell. Which statement below is correct? (Hint: Draw a picture)

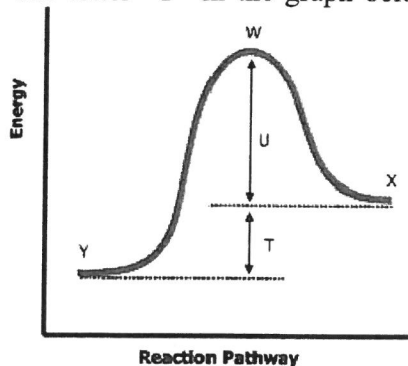
- A) The cell will expand as water moves out of it.
B) The cell will expand as water moves into it.
C) The cell will shrink as water moves out of it.
D) The cell will shrink as water moves into it.

36. Which statement is correct regarding the reaction in the equation below?



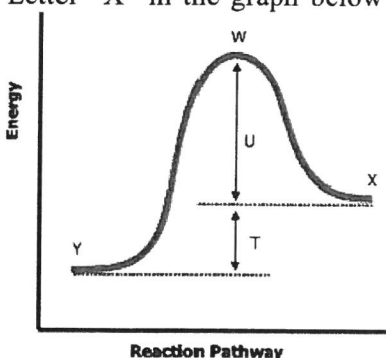
- A) $2H_2O$ is a product
 B) CH_4 and CO_2 are both products
 C) CH_4 is a product
 D) CO_2 is a reactant

37. The letter "Y" in the graph below represents _____.



- A) the enzyme
 B) the products
 C) activation energy
 D) the reactants

38. Letter "X" in the graph below represents _____.



- A) activation energy
 B) entropy
 C) products
 D) reactants

39. Which phrase best describes an **exothermic** chemical reaction?

- A) releases more energy than it absorbs
 B) feels cold
 C) is in a state of equilibrium
 D) absorbs more energy than it releases

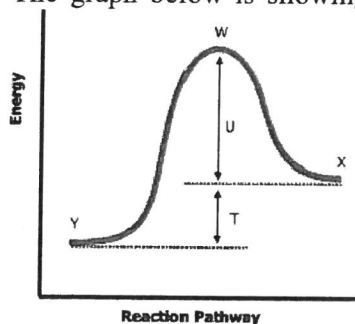
40. Enzymes are made of _____ and have names that often end in the suffix _____.

- A) proteins; -ase
 B) proteins; -ose
 C) lipids; -ose
 D) lipids; -ase

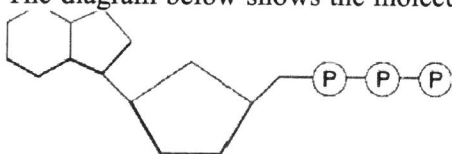
41. Extreme temperatures are the most dangerous to enzymes because _____.

- A) it decreases the amount of substrate
 B) it decreases the activation energy
 C) it speeds up the reaction
 D) it denatures the enzyme

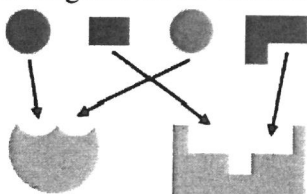
42. The graph below is showing an _____ reaction.



- A) endothermic
 B) isothermic
 C) exothermic
 D) hypothermic
43. The diagram below shows the molecule that is used by cells for **energy**. It is called _____.

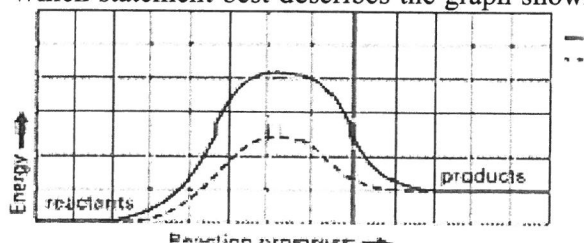


- A) ATP
 B) mRNA
 C) tRNA
 D) rRNA
44. The diagram below illustrates which important characteristic of enzymes?



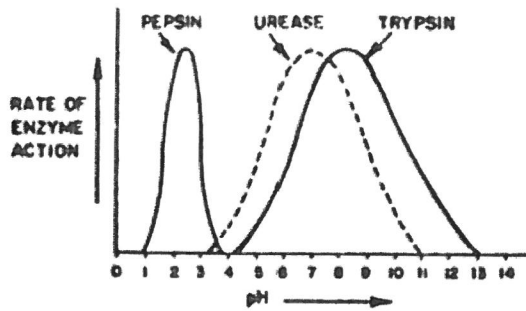
- A) enzymes only work with specific substrates
 B) an enzyme constantly changes its shape
 C) one enzyme can bind with every type of substrate
 D) enzymes are used up after a reaction
45. Enzymes _____ of a chemical reaction by _____.
- A) increase the reaction rate; increasing the activation energy
 B) decrease the reaction rate; increasing the activation energy
 C) increase the reaction rate; decreasing the activation energy
 D) decrease the reaction rate; decreasing the activation energy

46. Which statement best describes the graph shown below?

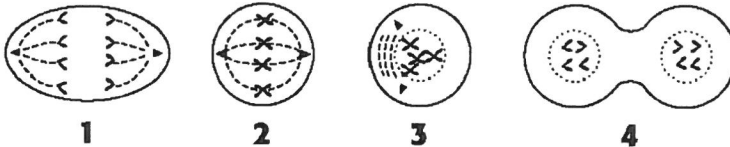


- A) The reactions are isothermic.
 B) Less activation energy is needed to start reaction B.
 C) Reaction A doesn't require any activation energy.
 D) Reaction B occurs at a slower rate.

47. Which of the following conclusions could be drawn concerning the enzymes shown in the figure below?



- A) At a pH of 5, the rate of activity of urease is the same as its rate at a pH of 11.
 B) At a pH of 4.0, the rate of activity of pepsin is the same as that of urease.
 C) At a pH of 7.5, the rate of activity of urease is the same as that of trypsin.
 D) At a pH of 12.0, the rate of activity of trypsin is increasing.
48. A parent cell has 12 chromosomes. How many chromosomes will each new daughter cell contain after the cell undergoes **mitosis**?
- A) 4
 B) 6
 C) 24
 D) 12
49. Which is the correct sequence of events in mitosis?
- A) prophase, telophase, metaphase, anaphase
 B) prophase, metaphase, anaphase, telophase
 C) prophase, metaphase, telophase, anaphase
 D) prophase, anaphase, metaphase, telophase
- 50.



Refer to the illustration above. Which of the following correctly indicates the order of events that occur in mitosis?

- A) 4, 3, 2, 1
 B) 3, 1, 4, 2
 C) 3, 2, 1, 4
 D) 1, 2, 3, 4

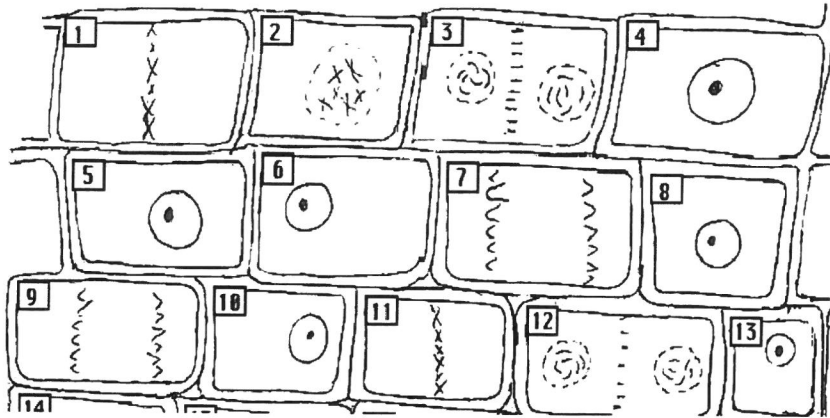
For questions 51-55, select the stage of the Cell Cycle that matches the description. Answers may be used more than once.

- A) Interphase
 B) cytokinesis
 C) mitosis

51. DNA replication occurs
 52. additional growth to prepare for mitosis
 53. normal cell growth
 54. cytoplasm divides
 55. nucleus divides

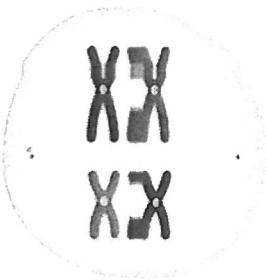
- 56.** A term used to describe cells that only have **one** copy of each type of chromosome is _____.
- A)** germ cell **C)** diploid
B) haploid **D)** somatic cell
- 57.** Chromosomes that are the same size and same shape and contain genes for the same types of traits are _____.
- A)** haploid **C)** somatic
B) homologous **D)** gametes

For questions 58-62, select which phases of the cell cycle are seen in the plant cells below.



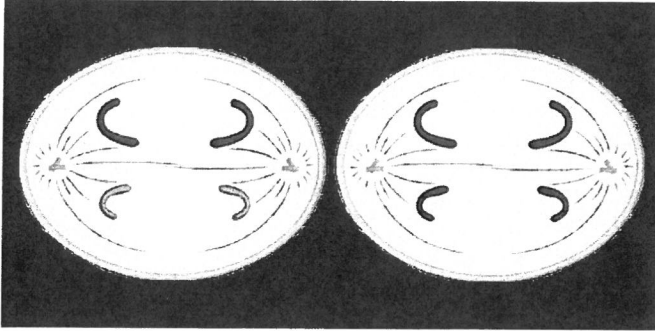
- A)** anaphase
B) prophase
C) interphase
D) telophase/cytokinesis
E) metaphase

- 58.** Cell number 1 is in what phase?
- 59.** Cell number 12 is in what phase?
- 60.** Cell number 2 is in what phase?
- 61.** Cell number 7 is in what phase?
- 62.** Cell number 4 is in what phase?
- 63.** Which phrase best describes the process of **meiosis**?
A) creates somatic cells **C)** creates diploid cells
B) creates haploid gametes(egg and sperm) **D)** creates genetically identical cells
- 64.** Homologous chromosomes line up across the equator from each other during _____.



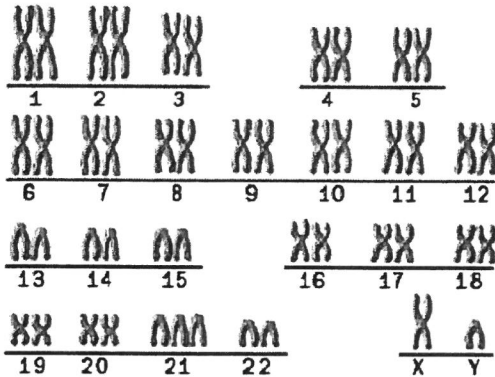
- A)** metaphase I
B) anaphase II
C) metaphase II
D) anaphase I

65. Sister chromatids move away from each other toward opposite ends of the cell during_____.



- A)** metaphase I **C)** metaphase II
B) anaphase I **D)** anaphase II

66. The child in this karyotype is a _____.



- A)** normal female **C)** normal male
B) female with Down Syndrome/Trisomy 21 **D)** male with Down Syndrome/Trisomy 21

67. DNA is an abbreviation for_____.

- A)** dihybrid nucleic acetate **C)** deoxygenated nuclear acetate
B) deoxyribonucleic acid **D)** dihydrous nitric acid

68. The twisted ladder shape of DNA is called what?

- A)** single polygon **C)** double polygon
B) double helix **D)** single helix

69. DNA is made of monomers called _____.

- A)** polymerase
B) nucleotides
C) amino acids
D) helicase

70. The four nitrogen bases found in **DNA** are _____.

- A)** adenine, guanine, cytosine, and thymine **C)** alanine, glycine, cysteine, uracil
B) uracil, cytosine, taurine, and adenine **D)** adenine, guanine, cytosine, and uracil

71. The complementary strand for the strand of DNA shown below is_____.

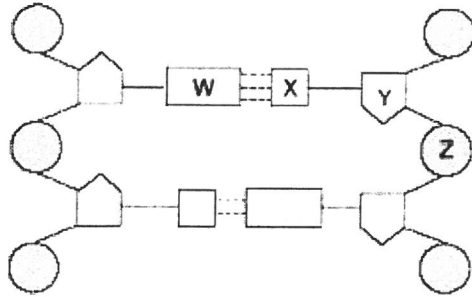
A T A C T C G

- A)** T A C A C T G **C)** T A T G A G C
B) G C T C A T A **D)** A T A C T C G

72. A scientist takes a sample of a DNA molecule and determines that **cytosine** composes **10%** of the nitrogen bases. Which of the following facts is true?

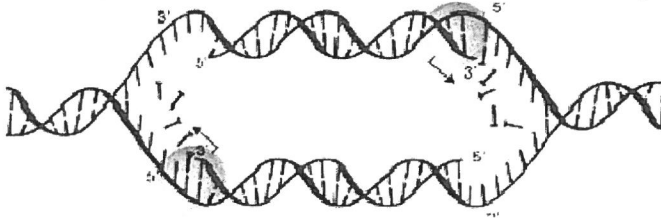
- A)** 90% of the DNA nitrogen bases must be guanine
B) 90% of the DNA nitrogen bases must be uracil
C) 10% of the DNA nitrogen bases must be guanine
D) 10% of the DNA nitrogen bases must be thymine

73. In the diagram below, a **nucleotide** is represented by ____.



- A)** W + X + Y
B) X + Y + Z
C) Y + Z
D) W + X

74. The diagram below shows which semi-conservative process that occurs before cell division?



- A)** phosphorylation
B) translation
C) transcription
D) replication

75. DNA's nitrogen bases can be classified as purines or pyrimidines. Which of the following statements is correct?

- A)** thymine and cytosine are pyrimidines
B) cytosine and guanine are pyrimidines
C) thymine and guanine are purines
D) adenine and thymine are purines

76. DNA replication in eukaryotes takes place in the ____.

- A)** mitochondria
B) ribosome
C) nucleus
D) cytoplasm

77. Central Dogma states that genetic information flows from ____ to ____ to ____.

- A)** DNA, PROTEIN, RNA
B) RNA, PROTEIN, DNA
C) DNA, RNA, PROTEIN
D) RNA, DNA, PROTEIN

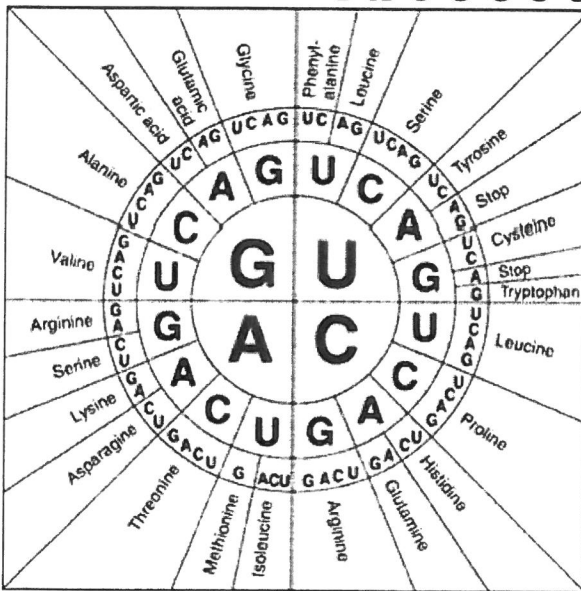
78. DNA is ____ stranded and RNA is ____ stranded.

- A)** double; single
B) single; double
C) triple; double
D) double; triple

79. Which of the following nitrogen bases is **not** found in RNA?

- A)** uracil
B) guanine
C) thymine
D) adenine

80. Which of the following shows the correct sequence of **mRNA** made from the following DNA strand:
T A T G G C A T G C
A) U A U G G C A U G C **C) A U A C C G U A C G**
B) A T A C C G T A C G **D) C G T A C G G T A T**
81. The process of creating a protein from mRNA is called _____.
A) replication **C) phosphorylation**
B) transcription **D) translation**
82. Proteins are made at the _____.
A) nucleus **C) chloroplast**
B) ribosome **D) mitochondria**
83. Proteins are made of monomers called _____.
A) glycoproteins **C) cholesterol**
B) amino acids **D) carbohydrates**
84. If the following strand of **DNA** goes through the processes of transcription and translation, which of the following sequences will it create?
T A C G G C C A A A C A



		2nd base in codon				3rd base in codon
		U	C	A	G	
1st base in codon	U	Pha Phe Leu Leu	Ser Ser Ser Ser	Tyr Tyr STOP STOP	Cys Cys STOP Trp	
	C	Leu Leu Leu Leu	Pro Pro Pro Pro	His His Gln Gln	Arg Arg Arg Arg	
	A	Ile Ile Ile Met	Thr Thr Thr Thr	Asn Asn Lys Lys	Ser Ser Arg Arg	
	G	Val Val Val Val	Ala Ala Ala Ala	Asp Asp Glu Glu	Gly Gly Gly Gly	

- A) TYR, GLY, VAL, CYS** **C) MET, PRO, VAL, CYS**
B) TYR, GLY, LEU, THR **D) MET, GLY, VAL, THR**

85. The type of mutation seen below is called _____.
 original strand: C G C G A U U G C
 mutated strand: C C G A U U G C
A) a substitution **C) an insertion**
B) an inversion **D) a deletion**
86. Which of the following is true about mutations?
A) mutations can be harmful, helpful, or have no effect **C) mutations are always harmful**
B) mutations are usually helpful **D) point mutations affect a protein more than frameshift mutations**

87. Genetics is the ____.
- A) study of chemistry C) study of science
B) study of biology D) study of heredity
88. This scientist used pea plants to determine the Law of Segregation and the Law of Independent Assortment.
- A) Crick C) Watson
B) Mendel D) Chargaff
89. Organisms that have two identical alleles (ex: hh) for a particular trait are described as being ____.
- A) hybrid C) dominant
B) homozygous D) heterozygous
90. Which of the following represents a heterozygous genotype?
- A) dd C) DD
B) AA D) Aa
91. Unattached earlobes are dominant to attached earlobes. A homozygous dominant male and a recessive female are crossed. The **genotypes** of their offspring will be?
- A) 100% heterozygous C) 100% homozygous
B) 75% homozygous & 25% heterozygous D) 50% homozygous & 50% heterozygous
92. A flower called a daffodil can be yellow, white, or yellow with white spots. The inheritance pattern of color in daffodils can be described as ____.
- A) sex-linked C) codominance
B) polygenic D) incomplete dominance
93. A tropical fish exhibits **incomplete dominance**. Crossing a blue fish with a yellow fish would result in a ____.
- A) blue and yellow striped fish C) a blue fish
B) a green fish D) a yellow fish
94. In figure 11-6, what relationship is shared by person #5 in the middle row and person #11 in the bottom row?

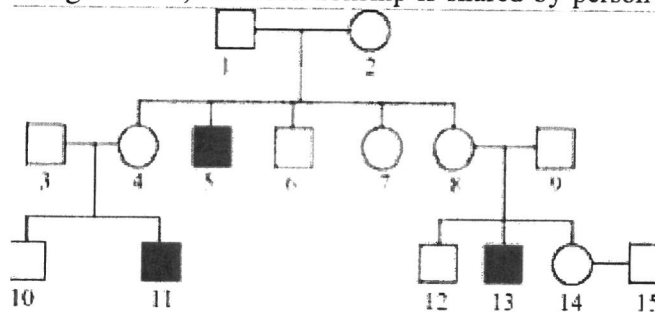
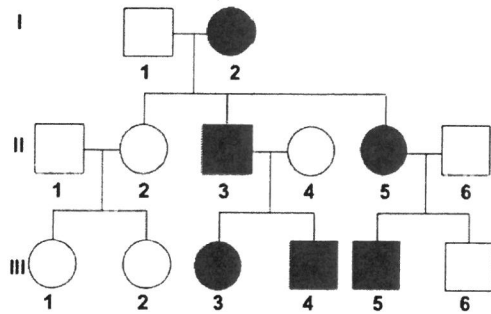


Figure 11-6

- A) grandmother and granddaughter C) uncle and nephew
B) mother and daughter D) grandfather and grandson
95. In Figure 11-6, circles represent ____.
- A) males C) females
B) adults D) children
96. In figure 11-6, how many generations are present?
- A) 3 C) 4
B) 2 D) 1

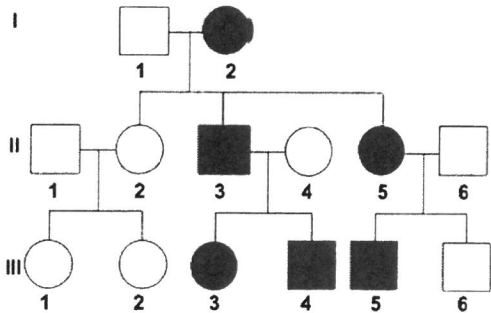
97. A man homozygous for Type B blood is married to a woman with Type O blood. What blood type will their children have?
- A) not enough information to determine
 B) Type B
 C) Type O
 D) Type A
98. A man heterozygous for blood type A marries a woman heterozygous for blood type B. The chance that their child will have type O blood is ____.
- A) 75%
 B) 25%
 C) 0%
 D) 50%



99.

Which individual is III-4's mother?

- A) III-3
 B) II-4
 C) II-3
 D) I-2



100.

How many males in the above pedigree are affected/have the trait?

- A) 3
 B) 14
 C) 4
 D) 6

**Biology Final Exam
Answer Section**

1. B
2. B
3. D
4. C
5. A
6. A
7. C
8. D
9. D
10. B
11. A
12. C
13. C
14. A
15. A
16. C
17. D
18. D
19. C
20. A
21. D
22. C
23. B
24. C
25. B
26. C
27. C
28. B
29. C
30. D
31. D
32. C
33. B
34. C
35. B
36. A
37. D

- 38. C
- 39. A
- 40. A
- 41. D
- 42. A
- 43. A
- 44. A
- 45. C
- 46. B
- 47. C
- 48. D
- 49. B
- 50. C
- 51. A
- 52. A
- 53. A
- 54. B
- 55. C
- 56. B
- 57. B
- 58. E
- 59. D
- 60. B
- 61. A
- 62. C
- 63. B
- 64. A
- 65. D
- 66. D
- 67. B
- 68. B
- 69. B
- 70. A
- 71. C
- 72. C
- 73. B
- 74. D
- 75. A
- 76. C
- 77. C

- 78. A
- 79. C
- 80. C
- 81. D
- 82. B
- 83. B
- 84. C
- 85. D
- 86. A
- 87. D
- 88. B
- 89. B
- 90. D
- 91. A
- 92. C
- 93. B
- 94. C
- 95. C
- 96. A
- 97. B
- 98. B
- 99. B
- 100. A

