AP BIOLOGY REVIEW

1. How many covalent bonds can carbon form?.....
2. Hydrogen bonds form between .....
3. pH is a measure of .....
4. What is a buffer?.....
5. What are the differences between catabolic and anabolic reactions?
6. Name the following functional groups:
    a. $-OH^-$ .....
    b. C=O .....
    c. -COOH .....
    d. $-NH_2$ .....
    e. -SH .....
    f. $-PO_4^-$ .....
7. What is the general formula for a monosaccharide?.....
    a. What is the function of monsaccharides?.....
    b. List three examples of monosaccharides .....
8. What are polysaccharides?.....
    a. What are the functions of polysaccharides?.....
    b. What are the functions of
        i. glycogen .....
        ii. starch .....
        iii. cellulose .....
        iv. chitin .....
9. What are the structural components of fats, phospholipids, and steroids? .....
    a. Fats store .....
    b. Phospholipids form .....
    c. Steroids may function as .....
10. Proteins are polymers of ..... joined by .....
    a. Describe the following structures of proteins:
    b. primary .....
    c. secondary .....
    d. tertiary .....
    e. quaternary .....
11. The three parts of a nucleotide are .....
    a. A and G are .....; C and T are .....

12. Explain the mechanism for DNA replication.
    a. Define these terms:

i. leading strand.....
ii. lagging strand.....
iii. 5’ & 3’ ends.....
iv. Okazaki fragments.....
v. origin of replication.....
vi. RNA primer.....
vii. DNA polymerase.....
viii. helicase.....
ix. DNA ligase.....

13. Explain how DNA codes for a protein
    a. Outline the steps in transcription and translation? Where does each occur?
        i. .....
        ii. .....
        iii. .....
        iv. .....
        v. .....
        vi. .....
    b. Explain the role of the following:
        i. RNA polymerase
        ii. promoter
        iii. operator
        iv. repressor
        v. STOP codon
14. Energy is defined as .....
15. What is entropy?.....
16. How does ATP power cellular work?.....
17. How do enzymes control the rate of chemical reactions?.....
    a. Sketch a graph showing the energy changes with an exergonic reaction with and without enzyme present

    b. Explain the “induced fit” model of enzyme action.....
    c. Explain how metabolic pathways are regulated by allosteric enzymes and cooperativity
18. List eight organelles found in the cell and their functions.
    a. .....
    b. .....

c. .....

d. .....

e. .....

f. .....

g. .....

h. .....

19. What are the differences between diffusion and active transport?
    a. .....
20. The three steps in respiration are.
    a. Glycolysis starts with ..... and produces .....
    b. Krebs cycle starts with ..... and produces .....
    c. electron transport chain starts with ..... and produces .....
21. Where do the following occur:
    a. Glycolysis .....
    b. Kreb's cycle .....
    c. electron transport chain .....
22. What are the two major parts of photosynthesis? .....
    a. Where does each part occur?.....
    b. What enters the light reactions? ..... What is produced?.....
    c. What enters the Calvin cycle? ..... What is produced?.....
23. List the three parts and events of the cell cycle.
    a. .....
    b. .....
    c. .....
24. List the phases of mitosis
    a. .....
    b. .....
    c. .....
    d. .....
25. Define hypotonic, hypertonic and isotonic.....
26. What is chemiosmosis?.....
27. Where in a cell does chemiosmosis occur (2 organelles) .....
28. What is photophosphorylation?.....
29. What is the difference between meiosis I and meiosis II?.....
30. List some differences between viruses and bacteria.....
31. List the tools and techniques of DNA technology.....
    a. Explain the use of restriction enzymes in both RFLP analysis and recombinant DNA technology

b. How can DNA be sequenced? ..... Amplified? ..... Analyzed?.....

32. Describe the three major types of mutations.
    a. .....
    b. .....
    c. .....
33. Describe three causes of mutations
    a. .....
    b. .....
    c. .....
34. What are the differences between the lytic and lysogenic cycle?
    a. lytic.....
    b. lysogenic.....
35. List the five conditions necessary for Hardy-Weinberg equilibrium.
    a. .....
    b. .....
    c. .....
    d. .....
    e. .....
36. State what each term in the Hardy-Weinberg formula and equation represents.
    a. p^2 .....
    b. 2pq .....
    c. q^2 .....
    d. p .....
    e. q .....
37. Describe some prezygotic and postzygotic barriers to the ability to interbreed.
    a. prezygotic.....
    b. postzygotic.....
38. What is allopatric speciation? .....What is sympatric speciation?.....
39. What is genetic drift?.....
40. What is gene flow?.....
41. What is fitness, as defined by Darwin?.....
42. What is natural selection?.....
43. What kind of cell is a protist?.....
44. List and describe the six kingdoms of life.
    a. .....
    b. .....
    c. .....
    d. .....

e. .....

f. .....

45. Define the following:
46. The three main parts of a plant are .....
47. The three basic tissue types in a plant are .....
48. The differences between primary and secondary growth are .....
49. Compare and contrast transpiration and translocation.....
50. What is the difference between xylem and phloem?.....
51. What are the five major plant hormones and their actions?.....
52. Briefly explain the role of auxin in phototropism and apical dominance.....
53. What is photoperiodism?.....
54. How are short day plants and long day plants different?.....
55. What effect does red and far red light have on photoperiod?.....
56. The four major tissue types in animals are.....
57. What are the three primary germ layers and what organ systems do each form in animal development?
    a. .....
    b. .....
    c. .....
58. What are four functions of the circulatory system?.....
59. How does the blood buffer system regulate blood pH? .....
60. What is the difference between systemic and pulmonary circulation?.....
61. What are the two main types of immune system defenses in animals?.....
62. List and define 5 non-specific immune responses?
    a. .....
    b. .....
    c. .....
    d. .....
    e. .....
63. What is the difference between cell mediated immunity and humoral immunity?
    a. .....
64. Differentiate between the primary and secondary immune response.
    a. .....
    b. .....
65. Which types of cells contribute to humoral immunity? Give the function for each type of cell.
    a. .....
66. Which types of cells contribute to cell mediated immunity? Give the function of each type of cell.
    a. .....
67. What are three of the functions of the vertebrate kidney?.....
68. What is the difference between an endotherm and an ectotherm?

a. .....

b. .....

69. Describe the peripheral vs. central nervous system

a. .....

b. .....

70. Contrast the sympathetic and parasympathetic nervous system.

a. .....

b. .....

71. Describe the parts of a neuron.

a. dendrites.....

b. axon.....

c. nodes of Ranvier.....

d. terminal branches.....

e. synaptic knobs.....

72. Describe the release of neurotransmitters at a synapse.....

73. What are actin and myosin?

a. .....

b. .....

74. What are the four essential nutrients?

a. .....

b. .....

c. .....

d. .....

75. What is plasma? .....What is its function?.....

76. What are the functions of erythrocytes, leukocytes, and platelets?

a. .....

b. .....

c. .....

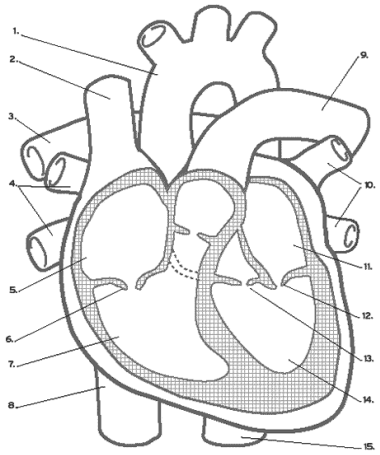
77. What is the difference between systole and diastole?.....

78. How does aldosterone work?.....

79. How does the renin-angiotesin system work?.....

80. How does antidiuretic hormone (ADH) work?.....

81. Trace the pathway of blood through the heart. (Label the diagram)



82. What is the mechanism of steroid hormone function?.....
83. What is the mechanism of peptide hormone function?.....
84. How second messengers work? .....
    a. Give two examples of second messengers..... .....
85. Where is insulin produced and what is its function? .....
86. Where is glucagon produced and what is its function? .....
87. Define the following:

    cleavage .....

    blastula .....

    gastrulation .....

    archenteron .....
88. What is the difference between the autonomic nervous system and the somatic nervous system?
89. Give the functions and locations of the following parts of the brain:
    a. medulla .....
    b. pons.....
    c. cerebellum .....
    d. thalamus.....
    e. hypothalamus .....
    f. cerebral cortex.....
90. Describe three density dependent factors. .....
91. Describe three density independent factors. .....
92. What are the differences between exponential growth and logistic growth?
    a. .....
    b. .....

93. List and define the three types of symbiosis.
    a. .....
    b. .....

c. .....

94. What is competition? .....

95. What is predation? .....

96. What is a keystone predator? .....

97. What is a trophic level? .....

    a. How does energy flow through an ecosystem?.....

    b. What is meant by biomagnification?.....

98. What are the major concerns (and causes) regarding human impact on the environment on the following issues:

    a. Enhanced greenhouse effect.....

    b. Reduction of the ozone layer.....

    c. Acid precipitation.....

    d. Introduced species.....

99. Differentiate between learned and innate behavior.

    a. .....

    b. .....

100. Describe the following:

    a. Taxis .....

    b. Kinesis .....

    c. Imprinting .....

    d. Conditioning (operant and classical)

    .....

    e. Habituation .....

    f. Insight .....