Practice A & P Placement Exam 3 (answers on last page)

Basic Problem Solving Questions

1. A patient weighs 150 pounds. How many kilograms does he weigh? (1 kg = 2.2 pounds)
    a. 68.2 kilograms
    b. 330 kilograms
    c. 330 pounds
    d. 80 kilograms
    e. 176 kilograms

2. A physician prescribes that a patient take 5 ml of antibiotic. A vial contains 300 mg/2ml. How many grams will the nurse need to give the patient?
    a. 750 grams
    b. 0.750 grams
    c. 0.0333 grams
    d. 333 grams
    e. 1500 grams

3. Five grams of azulfidine has been ordered every 12 hours. The available tablets are 400 milligrams each. How many tablets will you in a day?
    a. 15 tablets
    b. 40 tablets
    c. 25 tablets
    d. 10 tablets
    e. 5 tablets

Chemistry

4. The subatomic particles that play the greatest role in cellular chemical reactions are
    a. Protons
    b. Neutrons
    c. Electrons
    d. Isotopes

5. The mass within in an atom comes from
    a. Protons only
    b. Protons and neutrons
    c. Electrons only
    d. Neutrons and electrons

6. An atom whose atomic number is 10 has how many electrons in its outermost energy level?
    a. 8
    b. 10
    c. 2
    d. 3
    e. 5

7. Isotopes are atoms of the same element that differ in their
    a. Number of electrons
    b. Number of neutrons
    c. Number of protons
    d. Ionic charge

8. Which of the following are found in the nucleus of an atom?
    a. Protons
    b. Neutrons
    c. Electrons
    d. A and B
    e. A, B, and C

9. Which of the following results from the making of a bond?
    a. Atoms become more reactive
    b. Molecules are broken down
    c. Electrons are destroyed
    d. Atoms become more stable

10. An atom becomes an ion when
    a. It gains or loses neutrons
    b. It forms a covalent bond
    c. It gains or loses electrons
    d. Hydrogen ions are shared
    e. It gains or loses protons

11. Which of the following is *not* a compound?
    a. A protein
    b. Glucose
    c. Methane
    d. Nitrogen
    e. Table salt

12. Water is a polar molecule because
    a. Oxygen is more electronegative than hydrogen.
    b. Hydrogen has more neutrons than oxygen.
    c. Hydrogen has more electrons than oxygen.
    d. Oxygen has more neutrons than hydrogen.
    e. Hydrogen is more electronegative than oxygen.

13. Potassium has one electron in its fourth shell, and chlorine has seven electrons in its third shell. Which of the following is most likely to be accurate?
    a. Chloride will give an electron to potassium to form an ionic bond
    b. Potassium will give an electron to chloride to form an ionic bond
    c. The two atoms will share the electron unequally in a polar bond
    d. The two atoms will share an electron equally in a covalent nonpolar bond

14. Nitrogen has seven protons, and hydrogen has one proton. Based on your knowledge of the rules of covalent bonding, which of the following molecules will form from the reaction of nitrogen and hydrogen?
    a. NH_5
    b. NH_3
    c. NH
    d. NH_2
    e. NH_4

15. Substances that are nonpolar and repelled by water are _____.
    a. Hydrolyzed
    b. Polar
    c. Hydrophilic
    d. Hydrophobic
16. A hydrogen bond is _____.
    a. A sharing of a pair of electrons between a hydrogen nucleus and an oxygen nucleus
    b. A sharing of a pair of electrons between a hydrogen nucleus and either and oxygen or nitrogen nucleus
    c. Formed when an electronegative atom of a molecule weakly interacts with a hydrogen atom that is already participating in a polar covalent bond
    d. None of the above

17. A covalent bond is one in which
    a. Electrons are shared
    b. Electrically neutral atoms have a mutual attraction
    c. Two charged atoms have a mutual attraction due to electron transfer
    d. Electrons are lost

18. Adding a base tends to _____ of a solution.
    a. Increase the H^+ concentration and raises the pH.
    b. Increase the H^+ concentration and lowers the pH.
    c. Increase the OH^- concentration and raises the pH.
    d. Increase the OH^- concentration and lowers the pH.
    e. Increase the OH^- concentration and raises or lowers the pH.

19. An acidic solution can be neutralized by _____
    a. Adding an acid
    b. Adding water
    c. Adding a base
    d. Adding buffer

20. A solution has a pH of 4. This pH is _____
    a. Neutral
    b. Basic
    c. Acidic
    d. Buffer
    e. The same pH as water

Macromolecules

21. Lipids_____.
    a. Include fats that are broken down into one fatty acid molecule and three glycerol molecules
    b. Are composed of monosaccharides
    c. Include triglycerides that serve as energy sources
    d. Include cartilage and chitin

22. DNA _____.
    a. Is one of the adenosine phosphates
    b. Is one of the nucleotide coenzymes
    c. Contains protein-building instructions
    d. Is composed of monsaccharides
    e. Is composed of amino acids

23. Carbon is part of so many different substances because _____
    a. Carbon generally forms 2 covalent bonds with a variety of other atoms
    b. A carbon atom generally forms four covalent bonds with a variety of atoms
    c. Carbon ionizes easily
    d. Carbon is a polar compound

24. All of the following are carbohydrates EXCEPT?
    a. Cellulose
    b. Starch
    c. Glycogen
    d. Triglyceride

25. The monomer of a nucleic acid is _____.
    a. Fatty acid
    b. Amino acid
    c. Nucleotide
    d. Nucleoside
    e. Nucleosome

Enzymes and Energy

26. An important principle of the second law of thermodynamics states that _____.
    a. energy can be transformed into matter, and because of this, we can get something for nothing
    b. energy can only be destroyed during nuclear reactions, such as those that occur inside the sun
    c. if energy is gained by one region of the universe, another place in the universe also must gain energy in order to maintain the balance of nature
    d. matter tends to become increasingly more disorganized

27. Essentially, the first law of thermodynamics states that _____.
    a. one form of energy cannot be converted into another
    b. entropy is increasing in the universe
    c. energy cannot be created or destroyed
    d. energy cannot be converted into matter or matter into energy

28. An enzyme is best described as _____.
    a. an acid
    b. protein
    c. a catalyst
    d. a fat
    e. both b and c

29. The following are accurate about enzymes EXCEPT?
    a. They lower the activation energy
    b. They denature at high temperatures
    c. They are consumed during the reaction
    d. They increase the rate of a reaction

Cell Structure and Function

30. Cell membranes of animals consist of _____.
    a. A lipid bilayer
    b. A protein bilayer
    c. Phospholipids and proteins
    d. Both a and c are correct

31. The nucleolus is the site where
    a. The protein and RNA subunits of ribosomes are assembled
    b. The chromatin is formed
    c. Chromosomes are bound to the inside of the nuclear envelope
    d. Chromosomes duplicate themselves

32. The _____ is free of ribosomes and curves through the cytoplasm like connecting pipes; the main site of lipid synthesis.
    a. Lysosome
    b. Golgi body
    c. Smooth ER
    d. Rough ER

33. Mitochondria convert energy stored in _____ to forms that the cell can use, principally ATP.
    a. Water
    b. Glucose
    c. Oxygen
    d. Carbon dioxide

34. _____ are sacs of enzymes that produce potentially harmful hydrogen peroxide.
    a. Nucleosomes
    b. Glyoxysomes
    c. Golgi bodies
    d. Peroxisomes

Cellular Transport

35. White blood cells use_____ to devour disease agents invading your body.
    a. Diffusion
    b. Bulk flow
    c. Osmosis
    d. Phagocytosis

36. Which of the is a form of active transport?
    a. Sodium-potassium pump
    b. Simple diffusion
    c. Facilitated diffusion
    d. Osmosis

37. _____ is the movement of water thru a membrane from a high water concentration to a less water concentration.
    a. Osmosis
    b. Passive transport
    c. Bulk flow
    d. Exocytosis

38. O_2, CO_2, H_2O, and other small, electrically neutral molecules move across the cell membrane by_____.
    a. Electric gradients
    b. Receptor-mediated endocytosis
    c. Simple diffusion
    d. Active transport

39. Ions such as H^+, Na^+, K^+, and Ca^{++} move across cell membranes against the concentration gradient by_____.
    a. Receptor mediated endocytosis
    b. Diffusion
    c. Facilitated diffusion
    d. Active transport

40. A cell is immersed in a hypertonic solution. The net movement of water will be _____.
    a. Out of the cell
    b. Into the cell
    c. No net movement
    d. Unable to determine

Cellular Reproduction

41. The replication of DNA occurs _____.
    a. between the growth phases of interphase
    b. immediately before prophase of mitosis
    c. during prophase of mitosis
    d. during prophase of meiosis

42. If a parent cell has sixteen chromosomes and undergoes mitosis, the resulting cells will have_____ chromosomes.
    a. sixty-four
    b. thirty-two
    c. sixteen
    d. eight
    e. four

43. The correct order of the stages of mitosis is _____.
    a. prophase, metaphase, telophase, anaphase
    b. telophase, anaphase, metaphase, prophase
    c. telophase, prophase, metaphase, anaphase
    d. anaphase, prophase, telophase, metaphase
    e. prophase, metaphase, anaphase, telophase

44. During _____, sisters chromatids of each chromosome are separated from each other, and those former partners, now chromosomes move to opposite poles.
    a. prophase
    b. metaphase
    c. anaphase
    d. telophase

45. Each DNA strand has a backbone that consists of alternating _____.
    a. purines and pyrimidines
    b. nitrogen- containing bases
    c. hydrogen bonds
    d. sugar and phosphate molecules

46. In DNA, complementary base-pairing occurs between _____.
    a. cytocine and uracil
    b. adenine and guanine
    c. adenine and uracil
    d. adenine and thymine

47. _____ and _____ are found in RNA but not in DNA.
    a. Deoxyribose; uracil
    b. Uracil; ribose
    c. Deoxyribose; thymine
    d. Thymine; ribose

Protein Synthesis

48. Genetic instructions are encoded in the base sequence of _____; molecules of _____ function in processes using genetic instructions to construct proteins
    a. DNA…DNA
    b. DNA…RNA
    c. RNA…DNA
    d. RNA…RNA

49. Chargaff's requirement that A=T and G=C suggested that _____.
    a. cytosine molecules pair up with guanine molecules, and thymine molecules pair up with adenine molecules
    b. the two strands in DNA run in opposite directions (are anti-parallel)
    c. the number of adenine molecules in DNA relative to the number of guanine molecules differs from one species to the next
    d. the replication process must necessarily be semiconservative

50. Transcription _____.
    a. occurs on the surface of a ribosome
    b. is the final process in the assembly of protein DNA template
    c. occurs during the synthesis of any type of RNA by use of a DNA template
    d. is catalyzed by DNA polymerase

51. _____ carries amino acids to ribosomes, where amino acids are linked into the primary structure of a polypeptide.
    a. mRNA
    b. tRNA
    c. rRNA
    d. An intron

52. Transfer RNA differs from other types of RNA because it _____.
    a. transfers genetic instructions from cell nucleus to cytoplasm
    b. it is a component of the initiation complex during transcription.
    c. carries an amino acid at one end
    d. contains codons

Cellular Respiration

53. A substance that gains electrons is _____.
    a. oxidized
    b. a catalyst
    c. reduced
    d. a substrate

54. All of the following are formed during glycolysis EXCEPT.
   a. ATP
   b. FADH2
   c. pyruvate
   d. NADH

55. Aerobic respiration takes place in which cell organelle?
   a. cytoplasm
   b. golgi complex
   c. plasma membrane
   d. mitochondria

56. Glycolysis would quickly halt if the process ran out of _____, which serves as the hydrogen and electron acceptor.
   a. $NADP^+$
   b. ADP
   c. NAD^+
   d. H2O

57.When NAD^+ combines with hydrogen, the NAD^+ is _____.
   a. reduced
   b. oxidized
   c. phosphorylated
   d. denatured

Homeostasis

Use the following description to answer questions 58-60.

The kidney releases erythropoietin hormone in response to low oxygen levels in the blood. Erythropoietin causes red bone marrow to increase the rate of production of red blood cells. The increased number of red blood cells deliver more oxygen to the body.

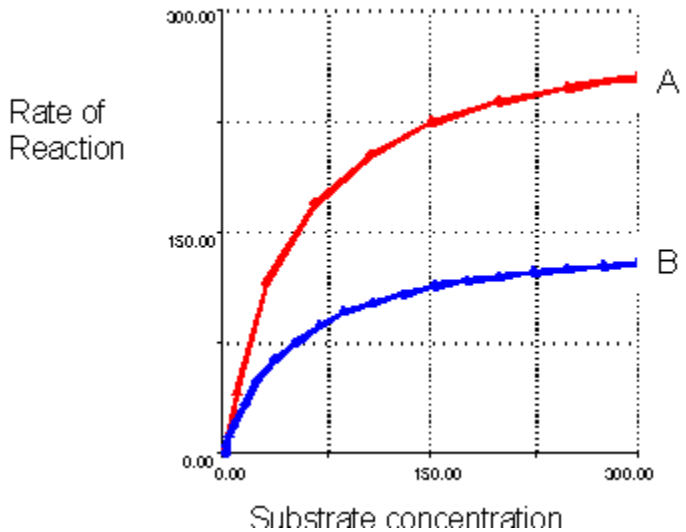
58. What is the stimulus?
   a. Erythropoietin
   b. Kidney
   c. Low blood oxygen
   d. Bone Marrow
   e. Concentration of RBCs

59. What is the receptor?
   a. Erythropoietin
   b. Kidney
   c. Low blood oxygen
   d. Bone Marrow
   e. Concentration of RBCs

60. This system is regulated by?
   a. Negative feedback
   b. Positive feedback
   c. No feedback
   d. Neural feedback

Graphing

Use the following graph to answer questions 61 and 62.



61. The graph above represents the relationship between _____.
    a. Substrate A and substrate concentration
    b. Substrate B and substrate concentration
    c. Substrate concentration and Rate of Reaction
    d. All of the above
    e. None of the above

62. For a concentration of 150 for Substrate A, what is the rate of the reaction?
    a. 150
    b. 225
    c. 100
    d. 300

A&P Practice Exam #3 Answer Key

1. A	17. A	33. B	49. A
2. B	18. C	34. D	50. C
3. C	19. C	35. D	51. B
4. C	20. C	36. A	52. C
5. B	21. C	37. A	53. C
6. A	22. C	38. C	54. B
7. B	23. B	39. D	55. D
8. D	24. D	40. A	56. C
9. D	25. C	41. A	57. A
10. C	26. D	42. C	58. C
11. D	27. C	43. E	59. B
12. A	28. E	44. C	60. A
13. B	29. C	45. D	61. C
14. B	30. D	46. D	62. B
15. D	31. A	47. B	
16. C	32. C	48. B	