

*The answers are in your book and in your notes. I will NOT be providing a key.

Chapter 1: Introduction to the Human Body:

- _____ 1) Histology would be best defined as a study of _____.
- A) cells
 - B) tissues
 - C) cell chemistry
 - D) the gross structures of the body
- _____ 2) The study of large body structures, visible to the naked eye, such as the heart is called _____ anatomy.
- A) microscopic
 - B) gross
 - C) developmental
 - D) systemic
- _____ 3) An increased rate of breathing as a result of an increased buildup of carbon dioxide in the bloodstream would be best described as an example of _____.
- A) maintaining boundaries
 - B) excretion of metabolic waste
 - C) responsiveness
 - D) metabolism
- _____ 4) Average body temperature is _____ degrees centigrade.
- A) 98
 - B) 68
 - C) 47
 - D) 37
- _____ 5) If you consider your home air conditioner in terms of homeostasis, then the wall thermostat would be the _____.
- A) control center
 - B) receptor
 - C) effector
 - D) variable
- _____ 6) What is the main, general purpose of negative feedback?
- A) to control body movement
 - B) to maintain homeostasis
 - C) to keep the body's blood sugar level high
 - D) to regulate excretion via the kidneys
- _____ 7) What is the regional term for the hip region?
- A) manus
 - B) inguinal
 - C) pedal
 - D) coxal
- _____ 8) An oblique cut is one that is cut _____.
- A) horizontally superior and inferior
 - B) diagonally between vertical and horizontal planes
 - C) vertically right and left
 - D) perpendicular to vertical and horizontal planes
- _____ 9) The heart lies in the _____ cavity.
- A) superior mediastinal
 - B) pleural
 - C) dorsal
 - D) pericardial
- _____ 10) The cavities housing the eyes are called _____ cavities.
- A) frontal
 - B) cranial
 - C) nasal
 - D) orbital
- _____ 11) A structure that is composed of two or more tissue types that work together to perform specific functions for the body is a(n) _____.
- A) complex tissue
 - B) organ system
 - C) organ
 - D) complex cell
- _____ 12) _____ cavities are spaces within joints.
- A) Nasal
 - B) Synovial
 - C) Orbital
 - D) Oral

- _____ 13) Which of the following would not be a functional characteristic of life?
 A) movement
 B) responsiveness to external stimuli
 C) maintenance of boundaries
 D) decay
- _____ 14) Which term means toward or at the back of the body, behind?
 A) anterior
 B) lateral
 C) distal
 D) dorsal
- _____ 15) The single most abundant *chemical* substance of the body, accounting for 60% to 80% of body weight, is _____.
 A) oxygen
 B) protein
 C) water
 D) hydrogen
- _____ 16) The posterior knee area is called _____.
 A) sural
 B) crural
 C) antecubital
 D) popliteal
- _____ 17) Which of the following statements is true concerning feedback mechanisms?
 A) Positive feedback mechanisms always result in excessive damage to the host.
 B) Negative feedback mechanisms tend to increase the original stimulus.
 C) Negative feedback mechanisms work to prevent sudden severe changes within the body.
 D) Blood glucose levels are regulated by positive feedback mechanisms.
- _____ 18) The anatomical position is characterized by all of the following EXCEPT _____.
 A) body erect
 B) arms at sides
 C) palms turned posteriorly
 D) thumbs pointed laterally
- _____ 19) A good example of a positive feedback mechanism would be _____.
 A) body temperature regulation
 B) regulating glucose levels in the blood
 C) enhancement of labor contractions
 D) blood calcium level regulation
- _____ 20) Which of the following describes a parasagittal plane?
 A) a transverse cut just above the knees
 B) two cuts dividing the body into left and right halves
 C) any sagittal plane except in the midline
 D) any cut dividing the body into anterior and posterior portions
- _____ 21) Which of the following organs or structures would be found in the left iliac region?
 A) appendix
 B) stomach
 C) liver
 D) intestines
- _____ 22) The parietal pleura would represent a serous membrane _____.
 A) covering individual lungs
 B) lining the thoracic cavity
 C) covering the heart
 D) lining the abdominal cavity
- _____ 23) Which one of the following systems responds fastest to environmental stimuli?
 A) muscular
 B) lymphatic
 C) immune
 D) nervous
- _____ 24) Choose the anatomical topic and definition that is not correctly matched.
 A) Gross anatomy: study of structures visible to the eye.
 B) Microscopic anatomy: study of structures too small to be seen by the naked eye.
 C) Cytology: study of the structures in a particular region.
 D) Embryology: study of the changes in an individual from conception to birth.
- _____ 25) Homeostasis is the condition in which the body maintains _____.
 A) the lowest possible energy usage
 B) a relatively stable internal environment, within limits
 C) a static state with no deviation from preset points
 D) a dynamic state within an unlimited range, depending on circumstances

- _____ 26) In which body cavities are the lungs located?
 A) pleural, ventral, and thoracic
 B) mediastinal, thoracic, and ventral
 C) pleural, dorsal, and abdominal
 D) pericardial, ventral, and thoracic
- _____ 27) Choose the following statement that is NOT completely correct regarding serous membranes.
 A) Serosa are very thin, double-layered structures.
 B) Serous membranes are divided into parietal and visceral membranes with a virtual space between the two.
 C) the parietal pericardium lines the internal walls of the heart.
 D) Serous membranes secrete a watery lubricating fluid.
- _____ 28) Place the following in correct sequence from simplest to most complex:
 A) Molecules, Atoms, Tissues, Cells, Organs.
 B) Atoms, Molecules, Cells, Tissues, Organs.
 C) Atoms, Molecules, Tissues, Cells, Organs.
 D) Molecules, Atoms, Cells, Tissues, Organs.
- _____ 29) Which of the following imaging devices would best localize a tumor in a adult's brain?
 A) X ray
 B) ultrasound
 C) PET
 D) MRI
- _____ 30) Which of these is NOT part of the dorsal cavity?
 A) cranial cavity
 B) thoracic cavity
 C) spinal cord
 D) vertebral cavity
- _____ 31) In which quadrant of the abdominopelvic cavity is the stomach mostly located?
 A) right upper quadrant
 B) right lower quadrant
 C) left upper quadrant
 D) left lower quadrant
- _____ 32) Which of the following statements is the most correct regarding homeostatic imbalance?
 A) It is considered the cause of most diseases.
 B) The internal environment is becoming more stable.
 C) Positive feedback mechanisms are overwhelmed.
 D) Negative feedback mechanisms are functioning normally.
- _____ 33) Which of the following are subdivisions of anatomy?
 A) gross, macroscopic, visual, and microscopic
 B) gross, regional, dissection, and surface
 C) regional, surface, visual, and microscopic
 D) regional, systemic, and surface
- _____ 34) The term pollex refers to the _____.
 A) great toe
 B) calf
 C) fingers
 D) thumb
- _____ 35) The dorsal body cavity is the site of which of the following?
 A) intestines
 B) brain
 C) lungs
 D) liver
- _____ 36) Select the most correct statement.
 A) The immune system is closely associated with the lymphatic system.
 B) Organ systems operate independently of each other to maintain life.
 C) The endocrine system is NOT a true structural organ system.
 D) Organ systems can be composed of cells or tissues, but NOT both.
- _____ 37) One of the functional characteristics of life is excitability or responsiveness. This refers to _____.
 A) indigestible food residues stimulating the excretory system
 B) sensing changes in the environment and then reacting or responding to them
 C) the nervous system causing all living things to sometimes experience anger
 D) the necessity for all organisms to reproduce
- _____ 38) Which of the following are survival needs of the body?
 A) nutrients, water, movement, and reproduction
 B) nutrients, water, growth, and reproduction
 C) water, atmospheric pressure, growth, and movement
 D) nutrients, water, atmospheric pressure, and oxygen

BIOL 220: Anatomy & Physiology 1 Practice Questions*

- _____ 39) The anatomical position is used _____.
- A) rarely, because people don't usually assume this position during waking moments
 - B) as a standard reference point for directional terms regardless of the actual position of the body
 - C) only when a body is lying down one one's back rather than stomach
 - D) for proper placement of a patient or a cadaver upon an operating table in order to reach all major organs
- _____ 40) What is a vertical section through the body, dividing it into left and right, called?
- A) frontal
 - B) regional
 - C) sagittal
 - D) transverse
- _____ 41) What is a vertical section through the body, dividing it into anterior and posterior regions called?
- A) frontal
 - B) median
 - C) sagittal
 - D) transverse
- _____ 42) The body cavities that protect the nervous system are located in the ____ cavity.
- A) cranial
 - B) dorsal
 - C) vertebral
 - D) thoracic
 - E) ventral
- _____ 43) Which of the following describes the function of the heart and blood vessels?
- A) systemic anatomy
 - B) cardiovascular anatomy
 - C) systemic physiology
 - D) cardiovascular physiology

Scenario for questions 44 through 52:

29 year old Dr. Anna Bågenholm from Sweden was skiing in the mountains with friends on May 20, 1999 when she lost control and fell headfirst onto the thin ice of a frozen stream. The ice opened up and she was trapped under the ice for 80 minutes due to the difficulty of rescuing her. Her core body temperature reached 13.7 °C (56.7 °F). When Dr. Bågenholm was removed from the ice, her pupils were dilated and her blood was not circulating. CPR was immediately started. She immediately was sent to the OR and placed on a heart lung bypass machine to gradually warm her blood. She awoke 10 days later, and eventually made a nearly full recovery (with no brain damage) over the next 140 days. Her survival with so few residual symptoms is due to the cold water slowing down her body's metabolism to about 10% of its baseline before her heart stopped. Her brain was so cold when her heart stopped that the neurons needed very little oxygen to survive (giving her rescuers time to get her help).

- _____ 44) Auscultation would be a good way to understand the abnormal function of which of Dr. Bågenholm's organs?
- A) Brain
 - B) Heart
 - C) Thyroid Gland
 - D) Liver
- _____ 45) Dr. Bågenholm survived the extreme hypothermia because the doctors were able to restore normal _____ in the OR.
- A) embryology
 - B) comparative anatomy
 - C) physiology
 - D) surface anatomy
- _____ 46) What imaging method is the most detailed way to evaluate the anatomy of Dr. Bågenholm's brain once she is stable?
- A) Magnetic Resonance Imaging (MRI)
 - B) Computed Tomography (CT)
 - C) Sonogram
 - D) Positron Emission Tomography (PET)
- _____ 47) What imaging method is the most detailed way to evaluate the function of Dr. Bågenholm's brain once she is stable?
- A) Computed Tomography (CT)
 - B) Magnetic Resonance Imaging (MRI)
 - C) Positron Emission Tomography (PET)
 - D) Sonogram
- _____ 48) Which organ system's function needed to be restored 1st in Dr. Bågenholm or else the other organ systems would not survive?
- A) Nervous system
 - B) Respiratory system
 - C) Cardiovascular system
 - D) Lymphatic system

BIOL 220: Anatomy & Physiology 1 Practice Questions*

- ____ 49) Dr. Bågenholm was left with some residual nerve damage in her hands. What other organ system(s) is(are) found in the hands?
- A) cardiovascular system
 - B) muscular system
 - C) integumentary system
 - D) all of the above
- ____ 50) The extreme hypothermia slowed down a critical process that breaks down bigger molecules into smaller ones. What is this process?
- A) Cellular Respiration
 - B) Excretion
 - C) Anabolism
 - D) Catabolism
- ____ 51) The long time spent with limited mobility in the ICU and in rehab would have caused Dr. Bågenholm's muscles to undergo _____.
- A) atrophy
 - B) apoptosis
 - C) hypertrophy
 - D) hyperplasia
- ____ 52) When Dr. Bågenholm's head and shoulders fell through the ice she was lying on her back. What position was her body in?
- A) Prone
 - B) Supine
 - C) Anterior
 - D) Ventral
- ____ 53) Who invented the Computed Tomography (CT)?
- A) Abigail Hensel
 - B) Walter Cannon
 - C) Godfrey Hounsfield
 - D) Wilhelm Röntgen

Chapter 2: Chemistry:

- _____ 1) Which of the following elements is necessary for proper conduction of nervous impulses?
 A) Fe
 B) I
 C) P
 D) Na
- _____ 2) The basic structural material of the body consists of _____.
 A) Carbohydrates
 B) Lipids.
 C) Proteins.
 D) Nucleic acids.
- _____ 3) In general, the lipids that we refer to as oils have _____.
 A) a high water content
 B) long fatty acid chains
 C) a high degree of saturated bonds
 D) a high degree of unsaturated bonds
- _____ 4) The genetic information is coded in DNA by the _____.
 A) regular alteration of sugar and phosphate molecules
 B) sequence of the nucleotides
 C) three-dimensional structure of the double helix
 D) arrangement of the histones
- _____ 5) Which of the following is not true of proteins?
 A) They may be denatured or coagulated by heat or acidity.
 B) They have both functional and structural roles in the body..
 C) They appear to be the molecular carriers of coded hereditary information.
 D) Their function depends on their three-dimensional shape.
- _____ 6) The single most abundant protein in the body is _____.
 A) DNA
 B) hemoglobin
 C) collagen
 D) glucose
- _____ 7) Carbohydrates are stored in the liver and muscles in the form of _____.
 A) glucose
 B) triglycerides
 C) glycogen
 D) cholesterol
- _____ 8) Which of the following does NOT describe enzymes?
 A) Some enzymes are purely protein.
 B) Some enzymes are protein plus a cofactor.
 C) Each enzyme is chemically specific.
 D) Enzymes work by raising the energy of activation.
- _____ 9) Which of the following is not a role of molecular chaperonins?
 A) prevent accidental, premature, or incorrect folding of polypeptide chains
 B) aid the desired folding and association process of polypeptides
 C) help to translocate proteins and certain metal ions across cell membranes
 D) promote the breakdown of damaged or denatured proteins
 E) act as a platform for assembling primary protein structure
- _____ 10) A chemical reaction in which bonds are broken is usually associated with _____.
 A) the release of energy
 B) the consumption of energy
 C) a synthesis
 D) forming a larger molecule
- _____ 11) Salts are always _____.
 A) ionic compounds
 B) single covalent compounds
 C) double covalent compounds
 D) hydrogen bonded
- _____ 12) The numbers listed represent the number of electrons in the first, second, and third energy levels, respectively. On this basis, which of the following is an unstable or reactive atom?
 A) 2, 8, 8
 B) 2, 8
 C) 2
 D) 2, 8, 1

- _____ 13) Which of the following statements is false?
 A) When acids and bases are mixed, they react with each other to form water and a salt.
 B) The more hydrogen ions in a solution, the more acidic the solution.
 C) When the hydrogen ion concentration decreases, the hydroxyl ion concentration also decreases.
 D) The pH of blood is slightly basic.
- _____ 14) Which of the following is the major positive ion outside cells?
 A) magnesium
 B) hydrogen
 C) potassium
 D) sodium
- _____ 15) Which of the following would be regarded as an organic molecule?
 A) H₂O
 B) NaCl
 C) NaOH
 D) CH₄
- _____ 16) What is a chain of more than 50 amino acids called?
 A) polypeptide
 B) polysaccharide
 C) protein
 D) nucleic acid
- _____ 17) What level of protein synthesis is represented by the coiling of the protein chain backbone into an alpha helix?
 A) primary structure
 B) secondary structure
 C) tertiary structure
 D) quaternary structure
- _____ 18) Carbohydrates and proteins are built up from their basic building blocks by the _____.
 A) addition of a water molecule between each two units
 B) addition of a carbon atom between each two units
 C) removal of a water molecule between each two units
 D) removal of a carbon atom between each two units
- _____ 19) Which statement about enzymes is false?
 A) Enzymes require contact with substrate in order to assume their active form.
 B) Enzymes have the ability to accelerate reactions as much as a billion-fold.
 C) Enzymes may use coenzymes derived from vitamins or cofactors from metallic elements.
 D) Enzymes may be damaged by high temperature.
- _____ 20) Which of the following statements is false?
 A) Chemical reactions proceed more quickly at higher temperatures.
 B) Chemical reactions progress at a faster rate when the reacting particles are present in higher numbers.
 C) Larger particles move faster than smaller ones and thus collide more frequently and more forcefully.
 D) Catalysts increase the rate of chemical reactions, sometimes while undergoing reversible changes in shape.
- _____ 21) Choose the answer that best describes HCO₃⁻.
 A) a bicarbonate ion
 B) common in the liver
 C) a weak acid
 D) a proton donor
- _____ 22) Select which reactions will usually be irreversible regarding chemical equilibrium in human bodies.
 A) glucose to CO₂ and H₂O
 B) ADP + Pi to make ATP
 C) H₂O + CO₂ to make H₂CO₃
 D) glucose molecules joined to make glycogen
- _____ 23) What happens in redox reactions?
 A) both decomposition and electron exchange occur
 B) the electron acceptor is oxidized
 C) the organic substance that loses hydrogen is usually reduced
 D) the reaction is uniformly reversible
- _____ 24) Choose the answer that best describes fibrous proteins.
 A) rarely exhibit secondary structure
 B) are very stable and insoluble in water
 C) are usually called enzymes
 D) are cellular catalysts
- _____ 25) Which of the following does not describe uses for the ATP molecule?
 A) chemical work
 B) mechanical work
 C) transport across membranes
 D) pigment structure

- _____ 26) Select the most correct statement regarding nucleic acids.
 A) Three forms exist: DNA, RNA, and tDNA.
 B) DNA is a long, double-stranded molecule made up of A, T, G, and C bases.
 C) RNA is a long, single-stranded molecule made up of the bases A, T, G, and C.
 D) tDNA is considered a molecular slave of DNA during protein synthesis.
- _____ 27) Which of the following is an example of a suspension?
 A) cytoplasm
 B) salt water
 C) rubbing alcohol
 D) blood
- _____ 28) Select the correct statement about isotopes.
 A) Isotopes of the same element have the same atomic number but differ in their atomic masses.
 B) All the isotopes of an element have the same number of neutrons but differing numbers of electrons.
 C) All the isotopes of an element are radioactive.
 D) Isotopes occur only in the heavier elements.
- _____ 29) The four elements that make up about 96% of body matter are _____.
 A) carbon, oxygen, phosphorus, calcium
 B) nitrogen, hydrogen, calcium, sodium
 C) carbon, oxygen, hydrogen, nitrogen
 D) sodium, potassium, hydrogen, oxygen
- _____ 30) _____ is fat soluble, produced in the skin on exposure to UV radiation, and necessary for normal bone growth and function.
 A) Vitamin K
 B) Cortisol
 C) Vitamin A
 D) Vitamin D
- _____ 31) You notice that you cannot read your book through a test tube of patient fluid held against the print, making it so blurred as to be unreadable. There is no precipitant in the bottom of the beaker, though it has been sitting for several days in a rack. What type of liquid is this?
 A) solution
 B) suspension
 C) colloid
 D) mixture
- _____ 32) Atom X has 17 protons. How many electrons are in its valence shell?
 A) 3
 B) 5
 C) 7
 D) 10
- _____ 33) Which protein types are vitally important to cell function in all types of stressful circumstances?
 A) structural proteins
 B) molecular chaperones
 C) catalytic proteins
 D) regulatory proteins
- _____ 34) If atom X has an atomic number of 74 it would have which of the following?
 A) 37 protons and 37 neutrons
 B) 37 electrons
 C) 74 protons
 D) 37 protons and 37 electrons
- _____ 35) What does the formula $C_6H_{12}O_6$ mean?
 A) There are 6 calcium, 12 hydrogen, and 6 oxygen atoms.
 B) There are, 6 carbon, 12 hydrogen, and 6 oxygen atoms.
 C) The molecular weight is 24.
 D) The substance is a colloid.
- _____ 36) An atom with a valence of 3 may have a total of _____ electrons.
 A) 3
 B) 8
 C) 13
 D) 17
- _____ 37) Which of the following is a neutralization reaction?
 A) $HCl \rightarrow H^+ + Cl^-$
 B) $NaOH \rightarrow Na^+ + OH^-$
 C) $NH_3 + H^+ \rightarrow NH_4^{+2}$
 D) $HCl + NaOH \rightarrow NaCl + H_2O$

- _____ 38) The chemical symbol O_2 means _____.
- zero equals zero
 - both atoms are bonded and have zero electrons in the outer orbit
 - the atoms are double bonded
 - this is an ionic bond with two shared electrons
- _____ 39) What is a dipole?
- a type of bond
 - a polar molecule
 - a type of reaction
 - an organic molecule
- _____ 40) What does CH_4 mean?
- There is one carbon and four hydrogen atoms.
 - There are four carbon and four hydrogen atoms.
 - This is an inorganic molecule.
 - This was involved in a redox reaction.
- _____ 41) Amino acids joining together to make a peptide is a good example of a(n) _____ reaction.
- synthesis
 - decomposition
 - exchange
 - reversible
- _____ 42) Which of the following is not considered a factor in influencing a reaction rate?
- temperature
 - concentration
 - particle size
 - time
- _____ 43) Which property of water is demonstrated when we sweat?
- high heat capacity
 - high heat of vaporization
 - polar solvent properties
 - reactivity
 - cushioning
- _____ 44) Sucrose is a _____.
- monosaccharide
 - disaccharide
 - polysaccharide
 - triglyceride
- _____ 45) What is the ratio of fatty acids to glycerol in neutral fats?
- 1:1
 - 2:1
 - 3:1
 - 4:1
- _____ 46) In a DNA molecule, the phosphate serves _____.
- as a code
 - to hold the molecular backbone together
 - to bind the sugars to their bases
 - as nucleotides
- _____ 47) Stress proteins are a type of protein called _____.
- coenzymes
 - cofactors
 - eicosanoids
 - chaperones
- _____ 48) Which bonds often bind different parts of a molecule into a specific three-dimensional shape?
- Carbon
 - Hydrogen
 - Oxygen
 - Amino acid
- _____ 49) Radiant (Electromagnetic) energy travels in wave frequencies of varied lengths and is measured in Hertz. Which of the following wave forms is just a bit smaller than the visible light spectrum in humans?
- X-rays
 - Micro waves
 - Gamma rays
 - Ultraviolet

- _____50) What is a portion of all energy conversions turned into?
 A) electrons
 B) heat
 C) oxygen
 D) water
- _____51) The most common 4 of the 24 elements found in the human body make up about _____ of our body weight.
 A) 99%
 B) 96%
 C) 89%
 D) 86%
- _____52) Which of the following elements is NOT one of the 4 most common elements in the human body?
 A) C
 B) P
 C) H
 D) N
- _____53) Which rare element in the body would you find primarily as a part of Thyroid hormones?
 A) Sodium
 B) Magnesium
 C) Iron
 D) Iodine
- _____54) Radioactive Isotopes differ from stable atomic forms of elements in that they usually have a _____ number of _____.
 A) higher, electrons
 B) higher, neutrons
 C) lower, electrons
 D) lower, neutrons
- _____55) Clotted blood is a result of a _____ not moving through the circulatory system with a beating heart.
 A) suspension
 B) colloid
 C) emulsion
 D) solution
- _____56) Which of the following generally has the weakest bonds and can be easily broken by surfactants and mild amounts of heat?
 A) peptide bonds
 B) covalent bonds
 C) ionic bonds
 D) hydrogen bonds
- _____57) Which of the following particles can typically move the quickest and thus increase the rate of a reaction?
 A) small particles
 B) large particles
 C) cold particles
 D) few particles
- _____58) The shapes known as the alpha-helix and the beta-sheet are types of _____ protein structure.
 A) primary
 B) secondary
 C) tertiary
 D) quaternary

Chapter 3: Cells:

- _____ 1) Which of the following is FALSE regarding the membrane potential?
- A) In their resting state, all body cells exhibit a resting membrane potential.
 - B) The resting membrane potential occurs due to active transport of ions across the membrane due to the sodium-potassium pump.
 - C) The resting membrane potential is determined mainly by the concentration gradients and differential permeability of the plasma membrane to K^+ and Na^+ ions.
 - D) The resting membrane potential is maintained by solely by passive transport processes.
- _____ 2) Which vesicular transport process occurs primarily in some white blood cells and macrophages?
- A) exocytosis
 - B) phagocytosis
 - C) pinocytosis
 - D) intracellular vesicular trafficking
- _____ 3) In certain kinds of muscle cells, calcium ions are stored in _____.
- A) the smooth ER
 - B) the rough ER
 - C) both smooth and rough ER
 - D) the cytoplasm
- _____ 4) The RNA responsible for bringing the amino acids to the ribosome for protein formation is _____.
- A) rRNA
 - B) mRNA
 - C) tRNA
 - D) ssRNA
- _____ 5) A red blood cell placed in pure water would _____.
- A) shrink
 - B) swell initially, then shrink as equilibrium is reached
 - C) neither shrink nor swell
 - D) swell and burst
- _____ 6) Which of the following describes the plasma membrane?
- A) a single-layered membrane that surrounds the nucleus of the cell
 - B) a double layer of protein enclosing the plasma
 - C) a phospholipid bilayer surrounding the cell
 - D) a membrane composed of tiny shelves or cristae
- _____ 7) Which of these is not a function of the plasma membrane?
- A) It is selectively permeable but permits water and gases to cross.
 - B) It prevents potassium ions from leaking out and sodium ions from crossing into the cell.
 - C) It acts as a site of cell-to-cell interaction and recognition.
 - D) It encloses the cell contents in such a way that water in the body is divided into separate compartments.
- _____ 8) Which structures are fingerlike projections that greatly increase the absorbing surface of cells?
- A) stereocilia
 - B) microvilli
 - C) primary cilia
 - D) flagella
- _____ 9) Which of the following statements is correct regarding net diffusion?
- A) The rate is independent of temperature.
 - B) The greater the concentration gradient, the faster the rate.
 - C) Molecular weight of a substance does not affect the rate.
 - D) The lower the temperature, the faster the rate.
- _____ 10) Which type of cell junction acts as anchors and distributes tension through a cellular sheet and reduces the chance of tearing when it is subjected to great mechanical stress?
- A) gap junctions
 - B) desmosomes
 - C) connexons
 - D) tight junctions
- _____ 11) If cells are placed in a hypertonic solution containing a solute to which the membrane is impermeable, what could happen?
- A) The cells will swell and ultimately burst.
 - B) The cells will lose water and shrink.
 - C) The cells will shrink at first, but will later reach equilibrium with the surrounding solution and return to their original condition.
 - D) The cells will show no change due to diffusion of both solute and solvent.
- _____ 12) What moves cell organelles from one location to another inside a cell?
- A) Motor proteins
 - B) Microtubules
 - C) Microfilaments
 - D) Intermediate filaments

- _____ 13) Once solid material is phagocytized and taken into a vacuole, which of the following statements best describes what happens?
 A) A ribosome enters the vacuole and uses the amino acids in the "invader" to form new protein.
 B) A lysosome combines with the vacuole and digests the enclosed solid material.
 C) The vacuole remains separated from the cytoplasm and the solid material persists unchanged.
 D) The phagocytized material is stored until further breakdown can occur..
- _____ 14) Riboswitches are folded RNAs that act as switches to turn protein synthesis on or off in response to _____.
 A) changes in the environment
 B) specific tRNAs
 C) specific codes from the DNA
 D) the presence or absence of ubiquitins
- _____ 15) Which of the following is a function of a plasma membrane protein?
 A) circulating antibody
 B) molecular transport through the membrane
 C) forms a lipid bilayer
 D) oxygen transport
- _____ 16) Which of the following statements is correct regarding RNA?
 A) Messenger RNA, transfer RNA, and ribosomal RNA play a role in protein synthesis.
 B) If the base sequence of DNA is ATTGCA, the messenger RNA template will be UCCAGU.
 C) There is exactly one specific type of mRNA for each amino acid.
 D) rRNA is always attached to the rough ER.
- _____ 17) Which of the following would not be a constituent of a plasma membrane?
 A) glycolipids
 B) messenger RNA
 C) glycoproteins
 D) phospholipids
- _____ 18) Mitosis _____.
 A) is the formation of sex cells
 B) is division of the nucleus
 C) creates diversity in genetic potential
 D) is always a part of the cell cycle
- _____ 19) The electron microscope has revealed that one of the components within the cell consists of pinwheel array of 9 triplets of microtubules arranged to form a hollow tube. This structure is a _____.
 A) centrosome
 B) centriole
 C) chromosome
 D) ribosome
- _____ 20) Which of these is an inclusion, not an organelle?
 A) melanin
 B) lysosome
 C) microtubule
 D) cilia
- _____ 21) Which of the following is not a factor that binds cells together?
 A) glycoproteins in the glycocalyx
 B) glycolipids in the glycocalyx
 C) wavy contours of the membranes of adjacent cells
 D) special membrane junctions
- _____ 22) If the nucleotide or base sequence of the DNA strand used as a template for messenger RNA synthesis is ACGTT, then what would be the sequence of bases in the corresponding mRNA?
 A) TGCAA
 B) ACGTT
 C) UGCAA
 D) GUACC
- _____ 23) Which transport process is the main mechanism for the movement of most macromolecules by body cells?
 A) phagocytosis
 B) pinocytosis
 C) receptor-mediated endocytosis
 D) secondary active transport
- _____ 24) Caveolae are closely associated with all of the following except _____.
 A) lipid rafts
 B) receptors for hormones
 C) enzymes involved in cell regulation
 D) enzymes involved in cell metabolism
- _____ 25) Passive membrane transport processes include _____.
 A) movement of a substance down its concentration gradient
 B) movement of water from an area of high solute concentration to an area of low concentration
 C) consumption of ATP
 D) the use of transport proteins when moving substances from areas of low to high concentration

- _____ 26) Which of the following is NOT a function of the smooth endoplasmic reticulum?
 A) lipid metabolism and cholesterol synthesis
 B) steroid-based hormone synthesis
 C) breakdown of stored glycogen to form free glucose
 D) protein synthesis in conjunction with ribosomes
- _____ 27) Mitochondria _____.
 A) are always the same shape
 B) are single-membrane structures involved in the breakdown of ATP
 C) contain some of the DNA and RNA code necessary for their own function
 D) synthesize proteins for use outside the cell
- _____ 28) Ribosomes, endoplasmic reticulum, and the Golgi apparatus functionally act in sequence to synthesize and modify proteins for secretory use (export) only, never for use by the cell. This statement is _____.
 A) false; proteins thus manufactured are for use inside the cell only
 B) false; integral cell membrane proteins are also synthesized this way
 C) false; lipids, not proteins, are synthesized this way
 D) true
- _____ 29) Peroxisomes _____.
 A) are also called microbodies, and contain acid hydrolases
 B) are able to detoxify substances by enzymatic action
 C) function to digest particles ingested by endocytosis
 D) sometimes function as secretory vesicles
- _____ 30) Which of the following is NOT a function of lysosomes?
 A) digesting particles taken in by endocytosis
 B) degrading worn-out or nonfunctional organelles
 C) forming acid hydrolases which are necessary to help form cell membranes
 D) breaking down bone to release calcium ions into the blood
- _____ 31) Which statement is the most correct regarding transcription/translation?
 A) The nucleotide sequence in a mRNA codon is an exact copy of the DNA triplet that coded for it.
 B) The nucleotide sequence in a mRNA codon is an exact copy of the DNA triplet that coded for it except that uracil is substituted for thymine.
 C) The nucleotide sequence in a tRNA anticodon is an exact copy of the DNA triplet that coded for it.
 D) The nucleotide sequence in a tRNA anticodon is an exact copy of the DNA triplet that coded for it except that uracil is substituted for thymine.
- _____ 32) In which stage of mitosis do the identical sets of chromosomes uncoil and resume their chromatin form?
 A) prophase
 B) metaphase
 C) anaphase
 D) telophase
- _____ 33) Which of the following is NOT a role of cell adhesion molecules:
 A) anchor cells to molecules in the extracellular space and to each other
 B) mechanical sensors
 C) initiators of cell-to-cell signaling for muscle contraction
 D) transmitters of intracellular signals that direct cell migration, proliferation, and specialization
- _____ 34) Which of the following does not serve as a signal for cell division?
 A) repressor genes
 B) joining of cyclins and Cdks
 C) loss of contact inhibition
 D) shrinking surface-to-volume ratio
- _____ 35) Which of the following is a principle of the fluid mosaic model of cell membrane structure?
 A) Phospholipids form a bilayer that is largely impermeable to water-soluble molecules.
 B) Phospholipids consist of a polar head and a nonpolar tail made of three fatty acid chains.
 C) The lipid bilayer is a solid at body temperature, thus protecting the cell.
 D) All proteins associated with the cell membrane are contained in a fluid layer on the outside of the cell.
- _____ 36) Which of the following statements is most correct regarding the intracellular chemical signals known as "second messengers"?
 A) Second messengers act through receptors called K-proteins.
 B) Second messengers usually inactivate protein kinase enzymes.
 C) Cyclic AMP and calcium may be second messengers.
 D) Second messengers usually act to remove nitric oxide (NO) from the cell.
- _____ 37) The main component of the cytosol is _____.
 A) proteins
 B) sugars
 C) salts
 D) water

- _____ 38) The functions of centrioles include _____.
- organizing the mitotic spindle in cell division
 - providing a whiplike beating motion to move substances along cell surfaces
 - serving as the site for ribosomal RNA synthesis
 - producing ATP
- _____ 39) A gene can best be defined as _____.
- a three-base triplet that specifies a particular amino acid
 - noncoding segments of DNA up to 100,000 nucleotides long
 - a segment of DNA that carries the instructions for one polypeptide chain
 - an RNA messenger that codes for a particular polypeptide
- _____ 40) Crenation (shrinking) is likely to occur in blood cells immersed in _____.
- an isotonic solution
 - a hypotonic solution
 - a hypertonic solution
 - blood plasma
- _____ 41) Some hormones enter cells via _____.
- exocytosis
 - primary active transport
 - pinocytosis
 - receptor-mediated endocytosis
- _____ 42) If a tRNA had an AGC anticodon, it could attach to a(n) _____ mRNA codon.
- AUG
 - UCG
 - TCG
 - UGA
- _____ 43) Who theorized that all new cells arise only from other pre-existing cells, and is also the Father of Modern Pathology?
- Rudolf Virchow
 - Matthias Schleiden
 - Robert Hooke
 - Theodor Schwann
- _____ 44) Which of the following is NOT characteristic of the plasma membrane of human cells?
- made mostly of phospholipid molecules
 - is about 7 to 10 μm (micrometers) thin
 - has proteins imbedded in its inside and outside surface
 - cholesterol molecules can be found scattered among the phospholipid tails
- _____ 45) The _____ has intermediate filaments of the cytoskeleton attached to them to distribute cell tension forces.
- channel proteins in the cell membrane
 - gap junctions
 - desmosomes
 - tight junctions
- _____ 46) The _____ energy of molecules is the energy source necessary for molecules to move down their concentration gradient so they can go from an area of high concentration on one side of a cell membrane to an area of low concentration on the other side.
- kinetic
 - potential
 - bond
 - electromagnetic
- _____ 47) All of the following involve an integral protein in the cell membrane EXCEPT which one?
- channel-mediated diffusion
 - channel-mediated diffusion
 - $\text{Na}^+\text{-K}^+$ pump
 - simple diffusion
- _____ 48) A healthy cell surrounded by a hypertonic solution would _____.
- do nothing
 - shrink in size
 - swell in size
 - undergo mitosis
- _____ 49) t-SNARE and v-SNARE molecules are associated with _____.
- pinocytosis
 - exocytosis
 - endocytosis
 - mitosis

_____50) Aerobic cellular respiration takes place in the _____.

- A) Golgi apparatus
- B) rough endoplasmic reticulum
- C) smooth endoplasmic reticulum
- D) mitochondria

_____51) Which of the following is genetically defective in Kartagener's Syndrome?

- A) intermediate filaments
- B) dynein arms
- C) microfilaments
- D) centrioles

_____52) Which subphase of interphase stops cells from going into mitosis?

- A) G₀
- B) G₁
- C) G₂
- D) S

Chapter 4: Tissues:

- _____ 1) Which of the following is not found in the matrix of cartilage but is found in bone?
 A) living cells
 B) lacunae
 C) blood vessels
 D) organic fibers
- _____ 2) The reason that intervertebral discs exhibit a large amount of tensile strength, which allows them to absorb shock, is because they possess _____.
 A) hydroxyapatite crystals
 B) collagen fibers
 C) reticular fibers
 D) elastic fibers
- _____ 3) What tissue has lacunae, calcium salts, and blood vessels?
 A) cartilage tissue
 B) fibrocartilaginous tissue
 C) osseous tissue
 D) areolar tissue
- _____ 4) How is hyaline cartilage different from elastic or fibrocartilage?
 A) It is more vascularized.
 B) It contains more nuclei.
 C) Fibers are not normally visible.
 D) It forms most of the embryonic skeleton..
- _____ 5) The blast cell for blood production is the _____.
 A) osteoblast
 B) chondroblast
 C) hemocytoblast
 D) fibroblast
- _____ 6) Which of the following would be of most importance to goblet cells and other glandular epithelium?
 A) microvilli
 B) Golgi bodies
 C) lysosomes
 D) multiple nuclei
- _____ 7) The simple columnar epithelium that form absorptive cells of the digestive tract have which characteristic?
 A) dense microvilli
 B) a rich vascular supply
 C) fibroblasts
 D) cilia
- _____ 8) Pseudostratified columnar epithelium ciliated variety _____.
 A) lines most of the respiratory tract
 B) aids in digestion
 C) possesses no goblet cells
 D) is not an epithelial classification
- _____ 9) Which of the following is a single-celled layer of epithelium that forms the lining of serous membranes?
 A) pseudostratified columnar
 B) simple columnar
 C) simple squamous
 D) simple cuboidal
- _____ 10) Which statement best describes connective tissue?
 A) usually contains a large amount of matrix
 B) typically arranged in a single layer of cells
 C) primarily concerned with secretion
 D) usually lines a body cavity
- _____ 11) Connective tissue matrix is composed of _____.
 A) cells and fibers
 B) fibers and ground substance
 C) ground substance and cells
 D) all organic compounds
- _____ 12) Cell type not found in areolar connective tissue.
 A) chondrocytes
 B) fibroblasts
 C) macrophages
 D) mast cells
- _____ 13) Which tissue type arises from all three embryonic germ layers?
 A) epithelial tissue
 B) connective tissue
 C) nervous tissue
 D) muscle tissue

- _____ 14) The fiber type that gives connective tissue great tensile strength is _____.
- elastic
 - collagen
 - reticular
 - muscle
- _____ 15) Groups of cells that are similar in structure and perform a common or related function form a(n) _____.
- organ
 - tissue
 - organism
 - organ system
- _____ 16) The shape of the external ear is maintained by _____.
- adipose tissue
 - elastic cartilage
 - hyaline cartilage
 - fibrocartilage
- _____ 17) Inability to absorb digested nutrients and secrete mucus might indicate a disorder in which tissue?
- simple squamous
 - transitional
 - simple columnar
 - stratified squamous
- _____ 18) Glands that secrete their products directly into the blood rather than through ducts are classified as _____.
- exocrine
 - endocrine
 - sebaceous
 - ceruminous
- _____ 19) Which of the following is true about epithelia?
- Simple epithelia are commonly found in areas of high abrasion.
 - Stratified epithelia are associated with filtration.
 - Endothelium provides a slick surface lining all hollow cardiovascular organs.
 - Pseudostratified epithelia are commonly keratinized.
- _____ 20) Chondroblasts _____.
- are mature cartilage cells located in spaces called lacunae
 - within the cartilage divide and secrete new matrix
 - remain in compact bone even after the epiphyseal plate closes
 - never lose their ability to divide
- _____ 21) _____ appears to have two or three layers of cells, but all the cells are in contact with the basement membrane.
- Stratified cuboidal epithelium
 - Stratified columnar epithelium
 - Transitional epithelium
 - Pseudostratified columnar epithelium
- _____ 22) A many-layered epithelium with cuboidal basal cells and flat cells at its surface would be classified as _____.
- simple cuboidal
 - simple squamous
 - transitional
 - stratified squamous
- _____ 23) Edema occurs when
- areolar tissue soaks up excess fluid in an inflamed area
 - adipose cells enlarge by pinocytosis
 - collagen fibers enlarge as they change from dehydrated to hydrated shape
 - reticular connective tissue invades the area
- _____ 24) Which of the following is true about the mode of secretion of exocrine glands?
- Merocrine glands are not altered by the secretory process.
 - Apocrine cells are destroyed, then replaced, after secretion.
 - Holocrine cells are slightly damaged by the secretory process, but repair themselves.
 - These glands are ductless.
- _____ 25) Heart muscle cells would tend to separate without _____
- myofilaments
 - intercalated discs
 - flana
 - stroma
- _____ 26) Arteries, veins, and lymphatics keep clots from sticking as long as their _____ is intact and healthy.
- endothelium
 - mesothelium
 - transitional epithelium
 - simple cuboidal epithelium

- _____ 27) Which is true concerning muscle tissue?
 A) highly cellular and well vascularized
 B) cuboidal shape enhances function
 C) contains contractile units made of collagen
 D) is a single-celled tissue
- _____ 28) The first step in tissue repair involves _____.
 A) replacement of destroyed tissue by the same kind of cells
 B) proliferation of fibrous connective tissue
 C) inflammation
 D) formation of scar tissue
- _____ 29) What are the three main components of connective tissue?
 A) ground substance, fibers, and cells
 B) alveoli, fibrous capsule, and secretory cells
 C) collagen, elastin, and reticular fibers
 D) fibroblasts, chondroblasts, and osteoblasts
- _____ 30) Which of the following statements is true of connective tissue?
 A) Elastin fibers are sometimes called white fibers.
 B) When connective tissue is stretched, collagen gives it the ability to snap back.
 C) Collagen fibers provides high tensile strength.
 D) Reticular fibers form thick, rope-like structures.
- _____ 31) Select the correct statement regarding the stem cells of connective tissue.
 A) Connective tissue does not contain cells.
 B) Connective tissue cells are nondividing.
 C) Chondroblasts are the main cell type of connective tissue proper.
 D) "Blast" cells are undifferentiated, actively dividing cells.
- _____ 32) Select the correct statement regarding tissue repair.
 A) Granulation tissue is highly susceptible to infection.
 B) Inflammation causes capillaries to dilate and become permeable.
 C) Granulation tissue is another name for a blood clot.
 D) The clot is formed from dried blood and transposed collagen fibers.
- _____ 33) Select the correct statement regarding epithelia.
 A) Simple epithelia form impermeable barriers.
 B) Stratified epithelia are tall, narrow cells.
 C) Stratified epithelia are present where protection from abrasion is important.
 D) Pseudostratified epithelia consist of at least two layers of cells stacked on top of one another.
- _____ 34) Select the correct statement regarding adipose tissue.
 A) It is composed mostly of extracellular matrix.
 B) Its primary function is nutrient storage.
 C) Mature adipose cells are highly mitotic.
 D) Most of the cell volume is occupied by the nucleus.
- _____ 35) Which cells are commonly found wedged between simple columnar epithelial cells?
 A) goblet cells
 B) mast cells
 C) macrophages
 D) cilia
- _____ 36) Which of the following is not a step in tissue repair?
 A) Inflammation
 B) Restoration of blood supply
 C) Regeneration and fibrosis.
 D) Formation of new stem cells
- _____ 37) Mesenchymal cells are most commonly found in _____ connective tissue.
 A) areolar
 B) dense regular
 C) embryonic
 D) reticular
- _____ 38) Which of the following would most likely not be found on the apical surface of simple epithelial tissues?
 A) a smooth cell membrane
 B) microvilli
 C) cilia
 D) desmosomes

- _____39) What part of epithelia tissues acts as a scaffolding along which epithelial cells can migrate to repair that epithelial tissue?
- cilia
 - microvilli
 - basal lamina
 - desmosomes
- _____40) A spherical (round) to oval (egg-shaped) nucleus would most likely be found in what shape of cell?
- columnar
 - spiral
 - squamous
 - cuboidal
- _____41) Which of the following epithelial tissues would you most likely find goblet cells?
- Pseudostratified columnar
 - simple cuboidal
 - non-keratinized stratified squamous
 - transitional
- _____42) Which of the following organ systems is transitional epithelium only found?
- gastrointestinal system
 - respiratory system
 - cardiovascular system
 - urinary system
- _____43) Which of the following is TRUE?
- secretion of Merocrine gland cell products is by exocytosis
 - Merocrine gland cells accumulate with such a large volume of cell products they rupture
 - Merocrine gland cells have a higher rate of mitosis than Holocrine gland cells
 - an example of a Merocrine gland is the sebaceous oil glands in the skin
- _____44) Which of the following large extracellular molecules has a shape similar to a bottle-brush and is very hydrophilic due to the strong negative charge on its surface?
- Collagen fibers
 - Elastic fibers
 - glycosaminoglycans (GAGs)
 - Reticular fibers
- _____45) The lacuna in _____ are found in short little stacks to improve the tissue in withstanding compression forces in one direction better?
- Hyaline cartilage
 - Fibrocartilage
 - Elastic cartilage
 - Compact bone
- _____46) Which type of muscle has intercalated discs?
- skeletal muscle
 - smooth muscle
 - cardiac muscle
 - none of the above
- _____47) Which of the following tissues has the worst capacity to regenerate after an injury?
- bone
 - areolar loose connective tissue
 - epithelial tissue
 - skeletal muscle

Chapter 5: Integumentary System:

- _____ 1) Select the most correct statement concerning skin cancer.
 A) Most tumors that arise on the skin are malignant.
 B) Squamous cell carcinomas arise from the stratum corneum.
 C) Basal cell carcinomas are the least common but most malignant.
 D) Melanomas are rare but must be removed quickly to prevent them from metastasizing.
- _____ 2) _____ is an inherited condition that affects the heme pathway; it leaves the skin scarred and gums degenerated, and may have led to the folklore about vampires.
 A) Porphyria
 B) Decubitus ulcer
 C) Impetigo
 D) Rosacea
- _____ 3) A needle would pierce the epidermal layers of the forearm in which order?
 A) basale, spinosum, granulosum, corneum
 B) basale, spinosum, granulosum, lucidum, corneum
 C) granulosum, basale, spinosum, corneum
 D) corneum, granulosum, spinosum, basale
- _____ 4) The major regions of a hair shaft include all of the following except _____.
 A) medulla
 B) cortex
 C) external root sheath
 D) cuticle
- _____ 5) Acne is a disorder associated with _____.
 A) sweat glands
 B) sebaceous glands
 C) Meibomian glands
 D) ceruminous glands
- _____ 6) The single most important risk for skin cancer is _____.
 A) race
 B) genetics
 C) use of farm chemicals
 D) overexposure to UV radiation
- _____ 7) What is the most important role of the arrector pili muscles in humans?
 A) Help retain heat
 B) Defense
 C) Cause the hair follicle to stand erect
 D) Force sebum out of the hair follicle to the skin surface
- _____ 8) A splinter penetrated into the skin of the sole of the foot, almost to the papillary region of the dermis. Which layer of the epidermis would be the final layer injured?
 A) granulosum
 B) basale
 C) lucidum
 D) spinosum
- _____ 9) Which of the following cutaneous receptors is specialized for the reception of touch or light pressure?
 A) Meissner's corpuscles
 B) Pacinian corpuscles
 C) free nerve endings
 D) Krause's end bulbs
- _____ 10) Which of the following is a skin sensory receptor for touch?
 A) Pacinian corpuscle
 B) tactile corpuscle
 C) Ruffini body
 D) free nerve ending
- _____ 11) Which statement correctly explains why hair appears the way it does?
 A) Kinky hair has flat, ribbonlike hair shafts.
 B) Perfectly round hair shafts result in wavy hair.
 C) Air bubbles in the hair shaft cause straight hair.
 D) Gray hair is the result of hormonal action altering the chemical composition of melanin.
- _____ 12) Although the integument is a covering, it is by no means simple, and some of its functions include _____.
 A) the dermis providing the major mechanical barrier to chemicals, water, and other external substances
 B) resident macrophage-like cells whose function is to ingest antigenic invaders and present them to the immune system
 C) cooling the body by increasing the action of sebaceous glands during high-temperature conditions
 D) epidermal blood vessels serving as a blood reservoir

- _____ 13) The function of the root hair plexus is to _____.
- serve as a source for new epidermal cells for hair growth after the resting stage has passed
 - bind the hair root to the dermis
 - cause apocrine gland secretion into the hair follicle
 - allow the hair to assist in touch sensation
- _____ 14) Vernix caseosa is a _____.
- substance contributing to acne during adolescence
 - whitish material produced by fetal sebaceous glands
 - coat of fine, downy hair on the heads of balding men
 - cheesy-looking sudoriferous secretion on the skin of newborns
- _____ 15) Which glands produce ear wax?
- Merocrine glands
 - Apocrine glands
 - Ceruminous glands
 - Eccrine Glands
- _____ 16) The reason the hypodermis acts as a shock absorber is that _____.
- it is located just below the epidermis and protects the dermis from shock
 - it has no delicate nerve endings and can therefore absorb more shock
 - the major part of its makeup is adipose, which serves as an effective shock absorber
 - the cells that make up the hypodermis secrete a protective mucus
- _____ 17) Which type of skin cancer appears as a scaly reddened papule and tends to grow rapidly and metastasize?
- Melanoma
 - Squamous cell carcinoma
 - Basal cell carcinoma
 - Adenoma
- _____ 18) Which of the following cells and their functions are correctly matched?
- Keratinocytes — provide sense of touch and pressure
 - Melanocytes — protects cells in the stratum corneum from damaging effects of sun's rays
 - Dendritic cells — activate the immune system
 - Tactile cells — protection
- _____ 19) Melanocytes and keratinocytes work together in protecting the skin from UV damage when keratinocytes _____.
- provide the melanocyte with nutrients necessary for melanin synthesis
 - accumulate the melanin granules on their superficial portion, forming a UV-blocking pigment layer
 - maintain the appropriate pH in order for the melanocyte to synthesize melanin granules
 - maintain the appropriate temperature so the product of the melanocyte will not denature
- _____ 20) The epidermis consists of five layers of cells, each layer with a distinct role to play in the health, well-being, and functioning of the skin. Which of the following layers is responsible for cell division and replacement?
- stratum corneum
 - stratum granulosum
 - stratum basale
 - stratum lucidum
- _____ 21) The integumentary system is protected by the action of cells that arise from bone marrow and migrate to the epidermis. Which of the following cells serve this function?
- cells found in the stratum spinosum
 - macrophages called dendritic cells (Langerhans Cell)
 - keratinocytes, because they are so versatile
 - tactile cells
- _____ 22) Water loss through the epidermis could cause a serious threat to health and well-being. Which of the following protects us against excessive water loss through the skin?
- Lamellar granules of the cells of the stratum granulosum, a glycolipid that is secreted into extracellular spaces.
 - The size and shape of the cells that make up the stratum spinosum, as well as the thick bundles of intermediate filaments.
 - The dermis is the thickest portion of the skin and water cannot pass through it.
 - Fat associated with skin prevents water loss.
- _____ 23) The dermis is a strong, flexible connective tissue layer. Which of the following cell types are likely to be found in the dermis?
- goblet cells, parietal cells, and chondrocytes
 - monocytes, reticulocytes, and osteocytes
 - fibroblasts, macrophages, and mast cells
 - osteoblasts, osteoclasts, and epithelial cells
- _____ 24) The dermis has two major layers. Which layer constitutes 80% of the dermis and is responsible for the tension lines in the skin?
- the reticular layer
 - the subcutaneous layer
 - the hypodermal layer
 - the papillary layer

- _____ 25) Despite its apparent durability, the dermis is subject to tearing. How might a person know that the dermis has been previously stretched and/or torn?
- There is an episode of acute pain due to the large number of tactile corpuscles.
 - The appearance of visible, silvery-white scars is an indication of stretching of the dermis.
 - The blood vessels in the dermis rupture and the blood passes through the tissue, causing permanent "black-and-blue marks."
 - The stretching causes the tension lines to disappear.
- _____ 26) The papillary layer of the dermis is connective tissue heavily invested with blood vessels. The superficial surface has structures called:
- dermal papillae.
 - hair follicles.
 - ceruminous glands.
 - reticular papillae.
- _____ 27) The design of a person's epidermal ridges is determined by the manner in which the papillae rest upon the dermal ridges to produce the specific pattern known as handprints, footprints, and fingerprints. Which of the following statements is true regarding these prints or ridges?
- Every human being has the same pattern of ridges.
 - They are genetically determined, therefore unique to each person.
 - Because we are constantly shedding epithelial cells, these ridges are changing daily.
 - Identical twins do not have the same pattern of ridges.
- _____ 28) Which of the following statements indicates the way in which the body's natural defenses protect the skin from the effects of UV damage?
- The skin is protected by the synthesis of three pigments that contribute to the skin's color.
 - Carotene, which accumulates in the stratum corneum and hypodermal adipose tissue, is synthesized in large amounts in the presence of sunlight.
 - The skin is protected by increasing the number of epidermal dendritic cells, which help to activate the immune system.
 - Prolonged exposure to the sun induces melanin dispersion, which in turn acts as a natural sunscreen.
- _____ 29) Changes in the color of skin are often an indication of a homeostatic imbalance. Which of the following changes would suggest that a patient is suffering from Addison's disease?
- The skin takes on a bronze or metallic appearance.
 - Black-and-blue marks become evident for no apparent cause.
 - The skin appears to have an abnormal, yellowish tint.
 - It is impossible to suggest Addison's disease from an inspection of a person's skin.
- _____ 30) A dendritic or Langerhans cell is a specialized _____.
- squamous epithelial cell
 - phagocytic cell
 - nerve cell
 - melanocyte
- _____ 31) What are the most important factors influencing hair growth?
- sex and hormones
 - age and glandular products
 - the size and number of hair follicles
 - nutrition and hormones
- _____ 32) Sudoriferous (sweat) glands are categorized as two distinct types. Which of the following are the two types of sweat glands?
- sebaceous and merocrine
 - mammary and ceruminous
 - eccrine and apocrine
 - holocrine and mammary
- _____ 33) The composition of the secretions of the eccrine glands is _____.
- primarily uric acid
 - 99% water, sodium chloride, trace amounts of wastes, and vitamin C
 - fatty substances, proteins, antibodies, and trace amounts of minerals and vitamins
 - metabolic wastes
- _____ 34) Apocrine glands, which begin to function at puberty under hormonal influence, seem to play little role in thermoregulation. Where would we find these glands in the human body?
- in all body regions and buried deep in the dermis
 - beneath the flexure lines in the body
 - in the axillary and anogenital area
 - in the palms of the hands and soles of the feet
- _____ 35) The sebaceous glands are simple alveolar glands that secrete a substance known as sebum. The secretion of sebum is stimulated _____.
- by high temperatures
 - when the air temperature drops
 - by hormones, especially androgens
 - as a protective coating when one is swimming
- _____ 36) In addition to protection (physical and chemical barrier), the skin serves other functions. Which of the following is another vital function of the skin?
- It converts modified epidermal cholesterol to a vitamin D precursor important to calcium metabolism.
 - It aids in the transport of materials throughout the body.
 - The cells of the epidermis store glucose as glycogen for energy.
 - It absorbs vitamin C so that the skin will not be subject to diseases.

- _____ 37) Burns are devastating and debilitating because of loss of fluids and electrolytes from the body. How do physicians estimate the extent of burn damage associated with such dangerous fluid loss?
 A) by measuring urinary output and fluid intake
 B) by observing the tissues that are usually moist
 C) through blood analysis
 D) by using the "rule of nines"
- _____ 38) What is the first threat to life from a massive third-degree burn?
 A) infection
 B) catastrophic fluid loss
 C) unbearable pain
 D) loss of immune function
- _____ 39) Eyebrow hairs are always shorter than hairs on your head because _____.
 A) they grow much slower
 B) eyebrow follicles are only active for a few months
 C) the vascular supply of the eyebrow follicle is one-tenth that of the head hair follicle
 D) hormones in the eyebrow follicle switch the growth off after it has reached a predetermined length
- _____ 40) What layer of skin would be found in your heel, but not in the skin on your face?
 A) Stratum lucidum
 B) Reticular layer of the dermis
 C) Stratum spinosum
 D) Stratum granulosum
 E) Hypodermis
 F) Stratum corneum
 G) Papillary layer of the dermis
 H) Stratum basale
- _____ 41) What layer of skin has the highest rate of mitosis?
 A) Stratum lucidum
 B) Reticular layer of the dermis
 C) Stratum spinosum
 D) Stratum granulosum
 E) Hypodermis
 F) Stratum corneum
 G) Papillary layer of the dermis
 H) Stratum basale
- _____ 42) Which layer of skin are the keratohyaline granules and lamellated granules accumulating just before the keratinocytes die?
 A) Stratum lucidum
 B) Reticular layer of the dermis
 C) Stratum spinosum
 D) Stratum granulosum
 E) Hypodermis
 F) Stratum corneum
 G) Papillary layer of the dermis
 H) Stratum basale
- _____ 43) Stretch marks (striae) are primarily a tear in what part of the skin that does not heal well?
 A) Stratum lucidum
 B) Reticular layer of the dermis
 C) Stratum spinosum
 D) Stratum granulosum
 E) Hypodermis
 F) Stratum corneum
 G) Papillary layer of the dermis
 H) Stratum basale
- _____ 44) Which of the following is the best location for tattoo ink?
 A) Stratum lucidum
 B) Reticular layer of the dermis
 C) Stratum spinosum
 D) Stratum granulosum
 E) Hypodermis
 F) Stratum corneum
 G) Papillary layer of the dermis
 H) Stratum basale
- _____ 45) Melanin pigments will migrate out of the melanocytes and move superficially to deposit on the sunny-side of keratinocytes in what layer?
 A) Stratum lucidum
 B) Reticular layer of the dermis
 C) Stratum spinosum
 D) Stratum granulosum
 E) Hypodermis
 F) Stratum corneum
 G) Papillary layer of the dermis
 H) Stratum basale
- _____ 46) Skin of the palm during the Allen's test begins with _____ and should normally end with _____ if the radial and ulnar arteries are both patent and healthy.
 A) pallor, blanching
 B) pallor, erythema
 C) cyanosis, blanching
 D) cyanosis, erythema
- _____ 47) _____ accumulation is the cause of the discoloration of the skin in both jaundice and bruising.
 A) poorly oxygenated hemoglobin
 B) Carotene
 C) Bilirubin
 D) well oxygenated hemoglobin

_____48) Which of the following measurements means the ABCDE rule for diameter is positive?

- A) 1 mm
- B) 3 mm
- C) 5 mm
- D) 7 mm

_____49) Which of the following describes 18% of the body surface area?

- A) anterior side of both upper extremities
- B) anterior side of the trunk
- C) anterior and posterior side of the head and neck
- D) anterior side of one lower extremity

Chapter 6: Bone Histology Questions:

- _____ 1) The structure of bone tissue suits the function. Which of the following bone tissues is adapted to support weight and withstand tension stress?
 A) spongy bone
 B) irregular bone
 C) compact bone
 D) trabecular bone
- _____ 2) Yellow bone marrow contains a large percentage of _____.
 A) fat
 B) blood-forming cells
 C) elastic tissue
 D) Sharpey's fibers
- _____ 3) The cell responsible for secreting the matrix of bone is the _____.
 A) osteocyte
 B) osteoblast
 C) osteoclast
 D) chondrocyte
- _____ 4) What kind of tissue is the forerunner of long bones in the embryo?
 A) elastic connective tissue
 B) dense fibrous connective tissue
 C) fibrocartilage
 D) hyaline cartilage
- _____ 5) What can a deficiency of growth hormone during bone formation cause?
 A) inadequate calcification of bone
 B) decreased osteoclast activity
 C) decreased proliferation of the epiphyseal plate cartilage
 D) increased osteoclast activity
- _____ 6) A fracture in the shaft of a bone would be a break in the _____.
 A) epiphysis
 B) metaphysis
 C) diaphysis
 D) articular cartilage
- _____ 7) The term diploë refers to the _____.
 A) double-layered nature of the connective tissue covering the bone
 B) fact that most bones are formed of two types of bone tissue
 C) internal layer of spongy bone in flat bones
 D) two types of marrow found within most bones
- _____ 8) Which of the following is a bone marking name that indicates an armlike bar of bone?
 A) meatus
 B) ramus
 C) foramen
 D) fossa
 E) epicondyle
- _____ 9) What causes osteoporosis?
 A) poor posture
 B) Osteoclasts out-pace osteoblasts due to low hormone production of the ovaries.
 C) heritage such as African or Mediterranean
 D) abnormal PTH receptors
- _____ 10) Ossification of the ends of long bones _____.
 A) is a characteristic of intramembranous bone formation
 B) involves medullary cavity formation
 C) is produced by secondary ossification centers
 D) takes twice as long as diaphysis ossification
- _____ 11) Which structure allows the diaphysis of the bone to increase in length until early childhood?
 A) lacunae
 B) Haversian system
 C) epiphyseal plate
 D) epiphyseal line
- _____ 12) Which of the following is the single most important stimulus for epiphyseal plate activity during infancy and childhood?
 A) parathyroid hormone
 B) calcium
 C) growth hormone
 D) thyroid hormone

- _____ 13) Which of the following is not a function of the skeletal system?
 A) support
 B) storage of minerals
 C) production of blood cells (hematopoiesis)
 D) communication
- _____ 14) What is the structural unit of compact bone?
 A) osseous matrix
 B) spongy bone
 C) lamellar bone
 D) the osteon
- _____ 15) Bones are covered and lined by a protective tissue called periosteum. The inner (osteogenic) layer consists primarily of _____.
 A) cartilage and compact bone
 B) marrow and osteons
 C) osteoblasts and osteoclasts
 D) chondrocytes and osteocytes
- _____ 16) The periosteum is secured to the underlying bone by dense connective tissue called _____.
 A) Volkmann's canals
 B) a bony matrix with hyaline cartilage
 C) perforating (Sharpey's) fibers
 D) the struts of bone known as spicules
- _____ 17) The canal that runs through the core of each osteon (the Haversian canal) is the site of _____.
 A) cartilage and interstitial lamellae
 B) adipose tissue and nerve fibers
 C) yellow marrow and spicules
 D) blood vessels and nerve fibers
- _____ 18) The resilience of bone is primarily due to which of the following?
 A) amount of mineral salts in the bone
 B) presence of osteoblasts in the bone
 C) sacrificial bonds in or between collagen molecules
 D) amount of mineral salt and protein in the bone
- _____ 19) For intramembranous ossification to take place, which of the following is necessary?
 A) A bone collar forms around the cartilage model.
 B) An ossification center forms in the fibrous connective tissue.
 C) The cartilage matrix begins to deteriorate.
 D) A medullary cavity forms.
- _____ 20) The process of bones increasing in width is known as _____.
 A) closing of the epiphyseal plate
 B) epiphyseal plate closure
 C) appositional growth
 D) concentric growth
- _____ 21) Bones are constantly undergoing resorption for various reasons. Which of the following cells accomplishes this process?
 A) osteoclast
 B) osteocyte
 C) osteoblast
 D) stem cell
- _____ 22) Which hormone increases osteoclast activity to release more calcium ions into the bloodstream?
 A) calcitonin
 B) thyroxine
 C) parathyroid hormone
 D) estrogen
- _____ 23) What is absolutely required for bone growth or healing from a fracture?
 A) dietary intake of calcium and vitamin D
 B) osteocytes
 C) osteoclasts
 D) osteoblasts
- _____ 24) Wolff's law is concerned with _____.
 A) vertical growth of bones being dependent on age
 B) the thickness and shape of a bone being dependent on stresses placed upon it
 C) the function of bone being dependent on shape
 D) the diameter of the bone being dependent on the ratio of osteoblasts to osteoclasts
- _____ 25) Cranial bones develop _____.
 A) from cartilage models
 B) within fibrous membranes
 C) from a tendon
 D) within osseous membranes

- _____ 26) Which of the following glands or organs produces hormones that tend to decrease blood calcium levels?
 A) pineal gland
 B) thyroid
 C) parathyroid
 D) spleen
- _____ 27) Osteomyelitis is _____.
 A) partially due to insufficient dietary calcium
 B) literally known as "soft bones"
 C) due to pus-forming bacteria
 D) caused by altered vitamin D metabolism
- _____ 28) Cartilage grows in two ways, appositional and interstitial. What is appositional growth?
 A) growth at the epiphyseal plate
 B) the secretion of new matrix against the external face of existing cartilage
 C) along the edges only of existing osteons, making each osteon larger
 D) the lengthening of hyaline cartilage
- _____ 29) Which of the following statements best describes interstitial growth?
 A) Growth occurs in the lining of the long bones.
 B) Fibroblasts give rise to chondrocytes that differentiate and form cartilage.
 C) Unspecialized cells from mesenchyme develop into chondrocytes, which divide and form cartilage.
 D) Chondrocytes in the lacunae divide and secrete matrix, allowing the cartilage to grow from within.
- _____ 30) In the epiphyseal plate, cartilage grows _____.
 A) by pulling the diaphysis toward the epiphysis
 B) by pushing the epiphysis away from the diaphysis
 C) from the edges inward
 D) in a circular fashion
- _____ 31) The structural unit of spongy is called _____.
 A) osteons
 B) lamellar bone
 C) trabeculae
 D) osseous lamellae
- _____ 32) Osteogenesis is the process of _____.
 A) making a cartilage model of the fetal bone
 B) bone destruction to liberate calcium
 C) bone formation
 D) making collagen fibers for calcified cartilage
- _____ 33) Lengthwise, long bone growth during infancy and youth is exclusively through _____.
 A) interstitial growth of the epiphyseal plates
 B) the secretion of bone matrix into the medullary cavity
 C) differentiation of osteoclasts into osteocytes
 D) calcification of the matrix of the zone underlying articular cartilage
- _____ 34) Growth of bones is controlled by a symphony of hormones. Which hormone is of greatest importance for bone growth during infancy and childhood?
 A) thyroid hormone
 B) somatomedins
 C) growth hormone
 D) prolactin
- _____ 35) In some cases the epiphyseal plate of the long bones of children closes too early. What might be the cause?
 A) overproduction of thyroid hormone
 B) elevated levels of sex hormones
 C) too much vitamin D in the diet
 D) osteoblast activity exceeds osteoclast activity
- _____ 36) Normal bone formation and growth are dependent on the adequate intake of _____.
 A) calcium, phosphate, and vitamin D
 B) potassium, phosphate, and vitamin D
 C) sodium, calcium, and vitamin E
 D) vitamin D, phosphate, and chloride
- _____ 37) What tissue forms the model for endochondrial ossification?
 A) cartilage
 B) membranes
 C) fascia
 D) bone

Chapter 7: Skeleton Questions:

- _____ 1) Which forms the largest portion of the coxal bone?
 A) ischium
 B) pubis
 C) ilium
 D) pelvic
- _____ 2) The membranous areas between the cranial bones of the fetal skull are called _____.
 A) areolas
 B) foramina
 C) sutures
 D) fontanelles
- _____ 3) What makes up the axial skeleton?
 A) the skull, vertebral column, and pelvis
 B) arms, legs, hands, and feet
 C) the skull, vertebral column, and rib cage
 D) shoulder and pelvic girdles
- _____ 4) The ethmoid bone is composed of all of the following except the _____.
 A) superior nasal concha
 B) crista galli
 C) cribriform plate
 D) inferior nasal concha
- _____ 5) Which vertebra does not have a body?
 A) last lumbar
 B) axis
 C) atlas
 D) last cervical
- _____ 6) The suture that connects the two parietal bones together is the _____.
 A) coronal
 B) sagittal
 C) lambdoid
 D) squamous
- _____ 7) The pituitary gland is housed in the _____.
 A) vomer
 B) sinuses of the ethmoid bone
 C) sella turcica of the sphenoid bone
 D) foramen lacerum
- _____ 8) The hyoid bone is unique because it _____.
 A) is the only bone of the body that does not articulate with any other bone
 B) is composed of three bones joined together
 C) is the only bone formed by the fusion of right and left halves
 D) is the only irregular bone found in the neck
- _____ 9) Along with support, the anterior ligament of the vertebral column also acts to _____.
 A) hold the discs in place
 B) prevent hyperextension of the spine
 C) hold the spine erect
 D) protect the spinal cord
- _____ 10) What is the major function of the intervertebral discs?
 A) absorb shock
 B) string the vertebrae together
 C) prevent hyperextension of the spine
 D) prevent hyperextension
- _____ 11) Paranasal sinuses are found in which of these facial bones?
 A) zygomatic bones
 B) nasal conchae
 C) vomer
 D) maxillae
- _____ 12) Which of the following is an abnormal lateral curvature of the vertebral column often seen in the thoracic region?
 A) kyphosis
 B) scoliosis
 C) lordosis
 D) swayback
- _____ 13) Which of the following phrases best describes the function of the vertebral curves?
 A) to provide resilience and flexibility
 B) to accommodate muscle attachment
 C) to improve cervical center of gravity
 D) to accommodate the weight of the pelvic girdle

- _____ 14) Which part of the vertebral column receives the most stress by bearing most of the weight of the body?
 A) the sacrum
 B) the cervical region
 C) the lumbar region
 D) the sacral promontory
- _____ 15) Which bone acts as a moveable base for the tongue?
 A) mandible
 B) hyoid bone
 C) zygomatic bone
 D) palatine
- _____ 16) Thoracic vertebrae differ from the other vertebrae in that they have _____.
 A) no transverse processes
 B) costal facets
 C) transverse foramina
 D) no intervertebral discs
- _____ 17) What is the major function of the axial skeleton?
 A) give the body resilience
 B) provide an attachment point for muscles that allow movement
 C) provide central support for the body and protect internal organs
 D) provide a space for the major digestive organs
- _____ 18) The antebrachium is composed of which of the following two bones?
 A) the radius and the ulna
 B) the humerus and the clavicle
 C) the scapula and the clavicle
 D) the humerus and the radius
- _____ 19) The "true wrist" or carpus consists of _____.
 A) a group of eight short bones united by ligaments
 B) the phalanges
 C) the styloid processes of the radius and ulna
 D) the metacarpals
- _____ 20) Which bone is in direct contact with the first metatarsal?
 A) medial cuneiform
 B) lateral cuneiform
 C) cuboid
 D) calcaneus
- _____ 21) Which bone forms the prominence of the cheek?
 A) zygomatic bone
 B) temporal bone
 C) sphenoid bone
 D) palatine bone
- _____ 22) Which of the following is true about paranasal sinuses?
 A) Paranasal sinuses open into the oral cavity.
 B) Paranasal sinuses enhance the resonance of the voice and lighten the skull.
 C) Paranasal sinuses contain passages acting as one-way valves.
 D) Paranasal sinuses are found in maxillary, ethmoid, and lacrimal bones.
- _____ 23) The superior orbital fissure is formed in the sphenoid bone, whereas the inferior orbital fissure is formed between the sphenoid and _____.
 A) palatine
 B) maxilla
 C) ethmoid
 D) lacrimal
- _____ 24) Which of the following is the abnormal curve often seen in pregnant women as they attempt to preserve their center of gravity toward the end of the pregnancy?
 A) kyphosis
 B) hunchback
 C) scoliosis
 D) lordosis
- _____ 25) How are thoracic vertebrae 11 and 12 different from the other vertebrae?
 A) The orientation of the articular processes is different from all the other thoracic vertebrae.
 B) The transverse processes do not have facets that articulate with the tubercles of the ribs.
 C) There are two foramina on vertebrae 11 and 12.
 D) The spinous processes are directed parallel with the centrum.

- _____ 26) Which bone contains areas of diaphysis and epiphysis areas, a tuberosity near its middle, and is proportionally more compact than spongy bone?
A) parietal bone
B) talus
C) humerus
D) cervical vertebra
- _____ 27) The superior nasal concha is a part of which bone?
A) vomer
B) ethmoid
C) sphenoid
D) maxilla
- _____ 28) The articulation that most closely resembles a hinge in the body involves which bones?
A) humerus-ulna
B) humerus-radius
C) femur-tibia
D) femur-fibula
- _____ 29) The pelvic girdle does not include the _____.
A) femur
B) ilium
C) ischium
D) pubis
- _____ 30) Which of the following bones is not weight bearing?
A) femur
B) tibia
C) fibula
D) talus
- _____ 31) Which portion of the fibula articulates with the talus?
A) calcaneus
B) head
C) medial malleolus
D) lateral malleolus
- _____ 32) Which part of the ethmoid bone forms the superior part of the nasal septum?
A) perpendicular plate
B) crista galli
C) cribriform plate
D) orbital plate
- _____ 33) Which of the following is not a movement that can occur between vertebrae?
A) flexion and extension
B) lateral flexion
C) rotation
D) supination

Chapter 8: Joint Questions:

- _____ 1) A fibrous joint that is a peg-in-socket is called a _____ joint.
 A) syndesmosis
 B) suture
 C) synchondrosis
 D) gomphosis
- _____ 2) The cruciate ligaments of the knee _____.
 A) tend to run parallel to one another
 B) are also called collateral ligaments
 C) prevent hyperextension of the knee
 D) attach to each other in their midportions
- _____ 3) Articular cartilage found at the ends of the long bones serves to _____.
 A) attach tendons
 B) produce red blood cells (hemopoiesis)
 C) provide a smooth surface at the ends of synovial joints
 D) form the synovial membrane
- _____ 4) A joint united by dense fibrocartilaginous tissue that usually permits a slight degree of movement is a _____.
 A) suture
 B) syndesmosis
 C) symphysis
 D) gomphosis
- _____ 5) On the basis of structural classification, which joint is fibrous connective tissue?
 A) symphysis
 B) synchondrosis
 C) pivot
 D) syndesmosis
- _____ 6) Connective tissue sacs lined with synovial membranes that act as cushions in places where friction develops are called _____.
 A) menisci
 B) bursae
 C) ligaments
 D) tendons
- _____ 7) Articulations permitting only slight degrees of movement are _____.
 A) amphiarthroses
 B) synarthroses
 C) diarthroses
 D) synovial joints
- _____ 8) Which of the following are cartilaginous joints?
 A) Syndesmoses
 B) Sutures
 C) Synchondroses
 D) Gomphoses
- _____ 9) The gliding motion of the wrist uses _____ joints.
 A) hinge
 B) plane
 C) pivot
 D) condyloid
- _____ 10) The ligaments that protect the alignment of the femoral and tibial condyles and limit the movement of the femur anteriorly and posteriorly are called _____.
 A) cruciate ligaments
 B) patellar ligaments
 C) anterior ligaments
 D) tibial collateral ligaments
- _____ 11) Bending your head backwards until it hurts is an example of _____.
 A) flexion
 B) extension
 C) hyperextension
 D) circumduction
- _____ 12) In the classification of joints, which of the following is true?
 A) Immovable joints are called amphiarthroses.
 B) All synovial joints are freely movable.
 C) Synarthrotic joints are slightly movable.
 D) In cartilaginous joints, a joint cavity is present.

- _____ 13) Synarthrotic joints _____.
- A) are found only in adults
 - B) are cartilaginous joints
 - C) permit essentially no movement
 - D) have large joint cavities
- _____ 14) Fibrous joints are classified as _____.
- A) pivot, hinge, and ball and socket
 - B) symphysis, sacroiliac, and articular
 - C) hinge, saddle, and ellipsoidal
 - D) sutures, syndesmoses, and gomphoses
- _____ 15) In symphysis joints the articular surfaces of the bones are covered with _____.
- A) hyaline cartilage
 - B) synovial membranes
 - C) fibrocartilage
 - D) tendon sheaths
- _____ 16) Synovial fluid is present in joint cavities of freely movable joints. Which of the following statements is true about this fluid?
- A) It contains enzymes only.
 - B) It contains lactic acid.
 - C) It contains hyaluronic acid.
 - D) It contains hydrochloric acid.
- _____ 17) Which of the following statements defines synchondroses?
- A) amphiarthrotic joints designed for strength and flexibility
 - B) interphalangeal joints
 - C) joints that permit angular movements
 - D) cartilaginous joints where hyaline cartilage unites the ends of bones
- _____ 18) What are menisci?
- A) cavities lined with cartilage
 - B) small sacs containing synovial fluid
 - C) semilunar cartilage pads
 - D) tendon sheaths
- _____ 19) Which of the following is a true statement regarding gliding movements?
- A) Gliding movements occur at the intercarpal and intertarsal joints.
 - B) Gliding movements allow flexibility of the upper limbs.
 - C) Gliding movements are multiaxial.
 - D) An example of a gliding movement is nodding one's head.
- _____ 20) What is moving a limb away from the median plane of the body along the frontal plane called?
- A) abduction
 - B) adduction
 - C) inversion
 - D) dorsiflexion
- _____ 21) The terms inversion and eversion pertain only to the _____.
- A) hands
 - B) feet
 - C) arms
 - D) hands and the feet
- _____ 22) The hip joint is a good example of a(n) _____ synovial joint.
- A) nonaxial
 - B) uniaxial
 - C) biaxial
 - D) multiaxial
- _____ 23) Which of the following movements does not increase or decrease the angle between bones?
- A) abduction
 - B) extension
 - C) rotation
 - D) circumduction
- _____ 24) Compared to the shoulder, displacements of the hip joints are _____.
- A) common due to the weight bearing the hip endures
 - B) rare because of the ligament reinforcement
 - C) common in all people who are overweight
 - D) rare because the rotator cuff stabilizes the hip joint
- _____ 25) Which ligament of the knee initiates the knee-jerk reflex when tapped?
- A) the patellar ligament
 - B) the medial patellar retinacula
 - C) the lateral patellar retinacula
 - D) the extracapsular ligament

- _____ 26) Football players often sustain lateral blows to the extended knee. Which of the ligaments is (are) damaged as a result?
 A) oblique popliteal and extracapsular ligament
 B) suprapatellar
 C) arcuate popliteal and the posterior cruciate
 D) medial collateral, medial meniscus, and anterior cruciate
- _____ 27) Pointing the toes is an example of _____.
 A) circumduction
 B) plantar flexion
 C) pronation
 D) protraction
- _____ 28) Which of the following is a true statement?
 A) The head of the humerus articulates with the acromion process.
 B) The greater tubercle of the humerus articulates at the coracoid process of the scapula.
 C) The rotator cuff is responsible for the flexible extensions at the elbow joint.
 D) The annular ligament surrounds the head of the radius.
- _____ 29) Presence of a synovial cavity, articular cartilage, synovial membrane, and ligaments are characteristics of what type of joint?
 A) suture
 B) synchondrosis
 C) symphysis
 D) hinge joint
- _____ 30) Extracapsular ligaments stabilizing the knee include _____.
 A) the patellar ligament extending from femur to patella
 B) lateral and medial collateral ligaments preventing lateral or medial angular movements
 C) cruciate ligaments, which help secure the articulating bones together
 D) the oblique popliteal crossing the knee anteriorly
- _____ 31) Which of the following is a correct statement about development of joints?
 A) Joints develop in parallel with bones.
 B) By the end of the fourth week, fetal synovial joints resemble adult joints.
 C) All fibrous joints are in the adult form by the time of birth.
 D) Joints develop independent of bone growth.
- _____ 32) An example of an interosseous fibrous joint is _____.
 A) the clavicle and the scapula at the distal ends
 B) the radius and ulna along its length
 C) between the vertebrae
 D) between the humerus and the glenoid cavity
- _____ 33) Which of the following statements best describes angular movements?
 A) They allow movement only in one plane.
 B) They allow movement in several planes.
 C) They occur only between bones with flat articular processes.
 D) They change (increase or decrease) the angle between two bones.
- _____ 34) Saddle joints have concave and convex surfaces. Identify the saddle joint of the skeleton.
 A) Interphalangeal joint of the finger.
 B) Metacarpophalangeal joint of the finger.
 C) Carpometacarpal joint of the phalanges.
 D) Carpometacarpal joint of the thumb.
- _____ 35) Tendon sheaths _____.
 A) act as friction-reducing structures
 B) are lined with dense irregular connective tissue
 C) are extensions of periosteum
 D) help anchor the tendon to the muscle
- _____ 36) Which of the following is not a part of the synovial joint?
 A) joint cavity
 B) tendon sheath
 C) articular cartilage
 D) articular capsule
- _____ 37) Which of the following is not a factor that contributes to keeping the articular surfaces of diarthroses in contact?
 A) structure and shape of the articulating bone
 B) arrangement and tension of the muscles
 C) strength and tension of joint ligaments
 D) number of bones in the joint

Chapter 9: Muscle Histology:

- _____ 1) What is the role of tropomyosin in skeletal muscles?
 A) Tropomyosin is the chemical that activates the myosin heads.
 B) Tropomyosin serves as a contraction inhibitor by blocking the myosin binding sites on the actin molecules.
 C) Tropomyosin serves as a contraction inhibitor by blocking the actin binding sites on the myosin molecules.
 D) Tropomyosin is the receptor for the motor neuron neurotransmitter.
- _____ 2) Which muscle cells have the greatest ability to regenerate?
 A) skeletal
 B) cardiac
 C) smooth
 D) no muscle can regenerate
- _____ 3) Most skeletal muscles contain _____.
 A) muscle fibers of the same type
 B) a mixture of fiber types
 C) a predominance of slow oxidative fibers
 D) a predominance of fast oxidative fibers
- _____ 4) Fatigued muscle cells that recover rapidly are the products of _____.
 A) intense exercise of long duration
 B) intense exercise of short duration
 C) slow exercise of long duration
 D) slow exercise of short duration
- _____ 5) The strongest muscle contractions are normally achieved by _____.
 A) increasing stimulus above the threshold
 B) increasing stimulus above the treppe stimulus
 C) increasing the stimulation up to the maximal stimulus
 D) recruiting small and medium muscle fibers
- _____ 6) Which of the following would be recruited later in muscle stimulation when contractile strength increases?
 A) motor units with the longest muscle fibers
 B) many small motor units with the ability to stimulate other motor units
 C) large motor units with small, highly excitable neurons
 D) motor units with larger, less excitable neurons
- _____ 7) Excitation-contraction coupling requires which of the following substances?
 A) Ca^{2+} and ATP
 B) Ca^{2+} only
 C) ATP only
 D) ATP and glucose
- _____ 8) Which of the following is a factor that affects the velocity and duration of muscle contraction?
 A) number of muscle fibers stimulated
 B) size of the muscle fibers stimulated
 C) load on the fiber
 D) muscle length
- _____ 9) Myoglobin _____.
 A) breaks down glycogen
 B) is a protein involved in the direct phosphorylation of ADP
 C) stores oxygen in muscle cells
 D) produces the end plate potential
- _____ 10) What structure in skeletal muscle cells functions in calcium storage?
 A) sarcoplasmic reticulum
 B) mitochondria
 C) intermediate filament network
 D) myofibrillar network
- _____ 11) What does excess post-exercise oxygen consumption represent?
 A) amount of oxygen needed for aerobic activity to accomplish the same amount of work
 B) the difference between the amount of oxygen needed for totally aerobic muscle activity and the amount actually used
 C) the amount of oxygen equal to the oxygen already used
 D) the amount of oxygen taken into the body immediately after the exertion
- _____ 12) Immediately following the arrival of the stimulus at a skeletal muscle cell there is a short period called the _____ period during which the neurotransmitter is released by exocytosis, diffuses across the synaptic cleft, and binds to its receptors.
 A) contraction
 B) relaxation
 C) latent
 D) refractory

- _____ 13) Creatine phosphate functions in the muscle cell by _____.
- forming a temporary chemical compound with myosin
 - forming a chemical compound with actin
 - inducing a conformational change in the myofilaments
 - storing energy that will be transferred to ADP to resynthesize ATP
- _____ 14) What is the primary function of wave summation?
- produce smooth, continuous muscle contraction
 - increase muscle tension
 - prevent muscle relaxation
 - prevent muscle fatigue
- _____ 15) The major function of the sarcoplasmic reticulum in muscle contraction is to _____.
- make and store phosphocreatine
 - synthesize actin and myosin myofilaments
 - provide a source of myosin for the contraction process
 - regulate intracellular calcium concentration
- _____ 16) What produces the striations of a skeletal muscle cell?
- a difference in the thickness of the sarcolemma
 - the arrangement of myofilaments
 - the sarcoplasmic reticulum
 - the T tubules
- _____ 17) During muscle contraction, myosin cross bridges attach to which active sites?
- myosin filaments
 - actin filaments
 - Z discs
 - thick filaments
- _____ 18) Which of the following surrounds the individual muscle cell?
- perimysium
 - endomysium
 - epimysium
 - fascicle
- _____ 19) Rigor mortis occurs because _____.
- the cells are dead
 - sodium ions leak into the muscle causing continued contractions
 - no ATP is available to release attached actin and myosin molecules
 - proteins are beginning to break down, thus preventing a flow of calcium ions
- _____ 20) Which of the choices below does not describe how excess post-exercise oxygen consumption (oxygen deficit) restores metabolic conditions?
- converts lactic acid back into glycogen stores in the liver
 - resynthesizes creatine phosphate and ATP in muscle fibers
 - increases the level of lactic acid in the muscle
 - replaces the oxygen removed from myoglobin
- _____ 21) The term aponeurosis refers to _____.
- the bands of myofibrils
 - a sheetlike indirect attachment to a skeletal element
 - the rough endoplasmic reticulum
 - the tropomyosin-troponin complex
- _____ 22) The oxygen-binding protein found in muscle cells is _____.
- hemoglobin
 - ATP
 - myoglobin
 - immunoglobulin
- _____ 23) The contractile units of skeletal muscles are _____.
- microtubules
 - mitochondria
 - T tubules
 - myofibrils
- _____ 24) What is the functional unit of a skeletal muscle called?
- a sarcomere
 - a myofilament
 - a myofibril
 - the sarcoplasmic reticulum
- _____ 25) What is the functional role of the T tubules?
- stabilize the G and F actin
 - enhance cellular communication during muscle contraction
 - hold cross bridges in place in a resting muscle
 - synthesize ATP to provide energy for muscle contraction

- _____ 26) What is the role of calcium ions in muscle contraction?
 A) form hydroxyapatite crystals
 B) reestablish glycogen stores
 C) bind to regulatory sites on troponin to remove contraction inhibition
 D) increase levels of myoglobin
- _____ 27) Which of the following is not a component of the standard treatment for muscle strain?
 A) rest of the muscle
 B) ice on the muscle
 C) elevation of the limb
 D) stretching of the muscle
- _____ 28) Which of the following is not a connective tissue sheath that wraps individual muscle fibers?
 A) endomysium
 B) perimysium
 C) epimysium
 D) aponeurosis
- _____ 29) During vigorous exercise, there may be insufficient oxygen available to completely break down pyruvic acid for energy. As a result, the pyruvic acid is converted to _____.
 A) a strong base
 B) stearic acid
 C) hydrochloric acid
 D) lactic acid
- _____ 30) When a muscle is unable to respond to stimuli temporarily, it is in which of the following periods?
 A) relaxation period
 B) refractory period
 C) latent period
 D) fatigue period
- _____ 31) In an isotonic contraction, the muscle _____.
 A) changes in length and moves the "load"
 B) does not change in length but increases tension
 C) never converts pyruvate to lactate
 D) rapidly resynthesizes creatine phosphate and ATP
- _____ 32) The muscle cell membrane is called the _____.
 A) endomysium
 B) sarcolemma
 C) perimysium
 D) epimysium
- _____ 33) Which of the following is the correct sequence of events for muscle contractions?
 A) motor neuron action potential, neurotransmitter release, muscle cell action potential, release of calcium ions from SR, ATP-driven power stroke, sliding of myofilaments
 B) neurotransmitter release, muscle cell action potential, motor neuron action potential, release of calcium ions from SR, sliding of myofilaments, ATP-driven power stroke
 C) muscle cell action potential, neurotransmitter release, ATP-driven power stroke, calcium ion release from SR, sliding of myofilaments
 D) neurotransmitter release, motor neuron action potential, muscle cell action potential, release of calcium ions from SR, ATP-driven power stroke
- _____ 34) The mechanism of contraction in smooth muscle is different from skeletal muscle in that _____.
 A) actin and myosin interact by the sliding filament mechanism
 B) the trigger for contraction is a rise in intracellular calcium
 C) the site of calcium regulation differs
 D) ATP energizes the sliding process
- _____ 35) Which of the following describes the cells of unitary smooth muscle?
 A) They depend upon recruitment using the autonomic nervous system.
 B) They are used for vision and hair raising.
 C) They exhibit spontaneous action potentials.
 D) They consist of muscle fibers that are structurally independent of each other.
- _____ 36) Which of the following is not a role of ionic calcium in muscle contraction?
 A) triggers neurotransmitter secretion
 B) binds with troponin
 C) removes contraction inhibitor
 D) activates epinephrine released from adrenal gland
- _____ 37) Which of the following is true about smooth muscle?
 A) Certain smooth muscle cells can actually divide to increase their numbers.
 B) Smooth muscle, in contrast to skeletal muscle, cannot synthesize or secrete any connective tissue elements.
 C) Smooth muscle cannot stretch as much as skeletal muscle.
 D) Smooth muscle has well-developed T tubules at the site of invagination.

- _____ 38) Smooth muscle is characterized by all of the following except _____.
- it appears to lack troponin
 - there are more thick filaments than thin filaments
 - there are no sarcomeres
 - there are non-contractile intermediate filaments that attach to dense bodies within the cell
- _____ 39) Muscle tissue has all of the following properties except _____.
- secretion
 - contractility
 - extensibility
 - excitability
- _____ 40) The giant protein titin maintains the organization of the _____ assisting in muscle stretching.
- A band
 - I band
 - Z disc
 - M line
- _____ 41) Which of the following statements is true?
- Cardiac muscle cells have many nuclei.
 - Smooth muscle cells have T tubules.
 - Striated muscle cells are long and cylindrical with many nuclei.
 - Cardiac muscle cells are found in the heart and large blood vessels.
- _____ 42) An anaerobic metabolic pathway that results in the production of two net ATPs per glucose plus two pyruvic acid molecules is _____.
- the citric acid cycle
 - glycolysis
 - hydrolysis
 - the electron transport chain
- _____ 43) Muscle tone is _____.
- the ability of a muscle to efficiently cause skeletal movements
 - the feeling of well-being following exercise
 - a state of sustained partial contraction
 - the condition of athletes after intensive training
- _____ 44) The sliding filament model of contraction involves _____.
- actin and myosin sliding past each other and partially overlapping
 - the shortening of thick filaments so that thin filaments slide past
 - actin and myosin lengthening in order to slide past each other
 - the Z discs sliding over the myofilaments
- _____ 45) After nervous stimulation stops, what prevents acetylcholine in the synaptic cleft from continuing to stimulate contraction?
- calcium ions returning to the terminal cisternae
 - the tropomyosin blocking the myosin once full contraction is achieved
 - acetylcholinesterase destroying the acetylcholine
 - the action potential stops going down the overloaded T tubules
- _____ 46) Which of the following statements is most accurate?
- Muscle tension remains relatively constant during isotonic contraction.
 - T tubules may be sliding during isotonic contraction.
 - The I band lengthens during isotonic contraction.
 - Myofilaments slide during isometric contractions.
- _____ 47) What is the most distinguishing characteristic of muscle tissue?
- the design of the fibers
 - the ability to respond to nervous stimulation
 - the diversity of activity of muscle tissue
 - the ability to transform chemical energy into mechanical energy
- _____ 48) Three discrete types of muscle fibers are identified on the basis of their size, speed, and endurance. Which of the following athletic endeavors best represents the use of red fibers?
- a sprint by an Olympic runner
 - a long, relaxing swim
 - playing baseball or basketball
 - gym climbing
- _____ 49) Of the following muscle types, which has only one nucleus, no sarcomeres, and rare gap junctions?
- visceral smooth muscle
 - multiunit smooth muscle
 - cardiac muscle
 - skeletal muscle
- _____ 50) Hypothetically, if a muscle were stretched to the point where thick and thin filaments no longer overlapped, _____.
- cross bridge attachment would be optimum because of all the free binding sites on actin
 - no muscle tension could be generated
 - maximum force production would result because the muscle has a maximum range of travel
 - ATP consumption would increase because the sarcomere is "trying" to contract

- _____ 51) What part of the sarcolemma contains acetylcholine receptors?
- A) motor end plate
 - B) end of the muscle fiber
 - C) part adjacent to another muscle cell
 - D) any part of the sarcolemma
- _____ 52) Which of the following statements is false or incorrect?
- A) Cardiac muscle contracts when stimulated by its own autorhythmic muscle cells.
 - B) Under normal resting conditions, cardiac muscle tissue contracts and relaxes about 75 times per minute.
 - C) Cardiac muscle fibers depend mostly on anaerobic cellular respiration to generate ATP.
 - D) Cardiac muscle fibers can use lactic acid to make ATP.

Chapter 10: The Skeletal Muscles:

- _____ 1) Which type of lever is demonstrated by using scissors?
 A) a first-class lever
 B) a second-class lever
 C) a third-class lever
 D) a fourth-class lever
- _____ 2) What muscle is primarily responsible for preventing foot drop?
 A) extensor digitorum longus
 B) tibialis anterior
 C) extensor hallucis longus
 D) fibularis tertius
- _____ 3) What is the major factor controlling how levers work?
 A) the structural characteristics of the muscles of the person using the lever
 B) the weight of the load
 C) the direction the load is being moved
 D) the difference in the positioning of the effort, load, and fulcrum
- _____ 4) Which of the following is not a muscle primarily involved in the breathing process?
 A) diaphragm
 B) external intercostal
 C) internal intercostal
 D) latissimus dorsi
- _____ 5) What is the main factor that determines the power of a muscle?
 A) the length
 B) the shape
 C) the number of neurons innervating it
 D) the total number of muscle cells available for contraction
- _____ 6) What is a muscle that provides the major force for producing a specific movement called?
 A) a synergist
 B) an agonist
 C) an antagonist
 D) a fixator
- _____ 7) When the term biceps, triceps, or quadriceps forms part of a muscle's name, what does it tell you about the muscle?
 A) The muscle has two, three, or four origins, respectively.
 B) The muscle is able to change direction twice, three times, or four times faster than other muscles, respectively.
 C) The muscle has two, three, or four functions, respectively.
 D) The muscle has two, three, or four insertions, respectively.
- _____ 8) The most powerful muscle in the body is the _____.
 A) quadriceps femoris
 B) rectus abdominis
 C) gastrocnemius
 D) gluteus maximus
- _____ 9) The names of muscles often indicate the action of the muscle. What does the term levator mean?
 A) The muscle flexes and rotates a region.
 B) The muscle is a fixator and stabilizes a bone or joint.
 C) The muscle elevates
 D) The muscle functions as a synergist.
- _____ 10) Which of the following describes the suprahyoid muscles?
 A) They depress the larynx and hyoid bone if the mandible is fixed.
 B) They are a group of muscles that lie superior to the hyoid bone and help form the floor of the oral cavity.
 C) They move the pharynx superiorly during swallowing.
 D) They are often called strap muscles.
- _____ 11) The supraspinatus is named for its location on the posterior aspect of the scapula above the spine. What is its action?
 A) to help hold the head of the humerus in the glenoid cavity and rotate the humerus laterally
 B) to stabilize the shoulder joint and help prevent downward location of the humerus and to assist in abduction
 C) to extend and medially rotate the humerus and to act as a synergist of the latissimus dorsi
 D) to flex and adduct the humerus and to act as a synergist of the pectoralis major
- _____ 12) Which of the following muscles is not a rotator cuff muscle?
 A) supraspinatus
 B) levator scapulae
 C) teres minor
 D) subscapularis
- _____ 13) Which of the following muscles is involved in producing horizontal wrinkles in the forehead?
 A) the medial pterygoid
 B) the zygomaticus major
 C) the frontal belly of the epicranium
 D) the temporalis

- _____ 14) Which muscle allows you to stick out your tongue?
 A) orbicularis oris
 B) stylohyoid
 C) hyoglossus
 D) genioglossus
- _____ 15) Which group of muscles flexes and rotates the neck?
 A) the scalenes
 B) the iliocostalis
 C) the spinalis
 D) the splenius
- _____ 16) Which of the following muscles is involved in crossing one leg over the other while in a sitting position?
 A) the gastrocnemius
 B) the sartorius
 C) all of the hamstrings
 D) the quadriceps femoris
- _____ 17) Which of the following muscles inserts by the calcaneal tendon?
 A) the semitendinosus
 B) the sartorius
 C) the tibialis anterior
 D) the gastrocnemius
- _____ 18) If a lever operates at a mechanical disadvantage, it means that the _____.
 A) load is far from the fulcrum and the effort is applied near the fulcrum
 B) lever system is useless
 C) effort is farther than the load from the fulcrum
 D) load is near the fulcrum and the effort is at the distal end
- _____ 19) Which of the following muscles fixes and depresses the ribs and stabilizes the pelvis during walking?
 A) internal oblique
 B) external oblique
 C) transversus abdominis
 D) rectus abdominis
- _____ 20) A muscle that opposes, or reverses, a particular movement is a(n) _____.
 A) antagonist
 B) fixator
 C) synergist
 D) agonist
- _____ 21) What type of muscle assists an agonist by causing a like movement or by stabilizing a joint over which an agonist acts?
 A) an antagonist
 B) a prime mover
 C) a synergist
 D) an agonist
- _____ 22) Which of the following is not a member of the hamstrings?
 A) gracilis
 B) semitendinosus
 C) semimembranosus
 D) biceps femoris
- _____ 23) A nursing infant develops a powerful sucking muscle that adults also use for whistling. What is this muscle called?
 A) platysma
 B) masseter
 C) zygomaticus
 D) buccinator
- _____ 24) Spasms of this strap-like muscle often result in wryneck or torticollis.
 A) serratus anterior
 B) zygomaticus
 C) platysma
 D) sternocleidomastoid
- _____ 25) Which generalization concerning movement by skeletal muscles is not true?
 A) Muscles produce movement by pulling on bones.
 B) The bones serve as levers.
 C) During contraction the two articulating bones move equally.
 D) The movements produced may be of graded intensity.
- _____ 26) Which of these is not a way of classifying muscles?
 A) muscle location
 B) the type of muscle fibers
 C) the type of action they cause
 D) muscle shape

- _____ 27) Which of the following muscles is not a member of the hamstrings group?
 A) vastus intermedius
 B) semitendinosus
 C) semimembranosus
 D) biceps brachii
- _____ 28) Which of the following best describes the orbicularis oris?
 A) It closes, purses, and protrudes the lips.
 B) It pulls the lower lip down and back.
 C) It draws the eyebrows together.
 D) It closes the eye.
- _____ 29) Which muscle group is involved when a "pulled groin" occurs?
 A) quadriceps
 B) thigh adductors
 C) lateral rotators
 D) hamstrings
- _____ 30) What are the levers that operate at a mechanical advantage called?
 A) speed levers
 B) power levers
 C) functional levers
 D) dysfunctional levers
- _____ 31) Tennis players often complain about pain in the arm (forearm) that swings the racquet. What muscle is usually strained under these conditions?
 A) the triceps brachii
 B) the anconeus
 C) the brachioradialis
 D) the flexor digitorum profundus
- _____ 32) Which muscles is (are) contracted to exhale forcibly?
 A) diaphragm alone
 B) internal intercostals and rectus abdominus
 C) external intercostals and diaphragm
 D) rectus abdominis and diaphragm
- _____ 33) Paralysis of which of the following would make an individual unable to flex the thigh?
 A) biceps femoris
 B) vastus medialis
 C) soleus
 D) iliopsoas and rectus femoris
- _____ 34) First-class levers _____.
 A) have load at one end of the lever, fulcrum at the other, and effort applied somewhere in the middle
 B) are typified by tweezers or forceps
 C) in the body can operate at a mechanical advantage or mechanical disadvantage, depending on specific location
 D) are the type using joints forming the ball of the foot as formed in raising the body on the toes
- _____ 35) What do the genioglossus, hyoglossus, and styloglossus muscles have in common?
 A) All names reflect direction of muscle fibers.
 B) Each acts synergistically to elevate the jaw.
 C) All act on the tongue.
 D) All names indicate the relative size of the muscle.
- _____ 36) If L = load, F = fulcrum, and E = effort, what type of lever system is described as LEF?
 A) first-class lever
 B) second-class lever
 C) third-class lever
 D) fourth-class lever
- _____ 37) Which of the following muscles is a flexor of the thigh?
 A) tibialis posterior
 B) vastus lateralis
 C) adductor magnus
 D) gluteus maximus
- _____ 38) Which of the following muscles is involved in inversion at the ankle joint?
 A) tibialis anterior
 B) extensor digitorum longus
 C) peroneus tertius
 D) peroneus longus
- _____ 39) Which of the following muscles serves as a common intramuscular injection site, particularly in infants?
 A) the vastus intermedius
 B) the vastus medialis
 C) rectus femoris
 D) the vastus lateralis

- _____ 40) Paralysis of which of the following muscles would make an individual unable to flex the knee?
A) hamstring muscles
B) gluteal muscles
C) brachioradialis
D) soleus
- _____ 41) Which of the following muscles does not act in plantar flexion?
A) popliteus
B) tibialis posterior
C) flexor digitorum longus
D) gastrocnemius and soleus

Chapter 11: Nerve Histology:

- _____ 1) Which of the following is not a function of astrocytes?
 A) support and brace neurons
 B) anchor neurons to blood vessels
 C) guide the migration of young neurons, synapse formation, and helping to determine capillary permeability
 D) control the chemical environment around neurons
 E) provide the defense for the CNS
- _____ 2) Which of the choices below describes the ANS?
 A) motor fibers that conduct nerve impulses from the CNS to smooth muscle, cardiac muscle, and glands
 B) motor fibers that conduct nerve impulses from the CNS to skeletal muscles
 C) sensory neurons that convey information from somatic receptors in the head, body wall, and limbs and from receptors from the special senses of vision, hearing, taste, and smell to the CNS
 D) sensory and motor neurons that supply the digestive tract
- _____ 3) What are ciliated CNS neuroglia that play an active role in moving the cerebrospinal fluid called?
 A) ependymal cells
 B) Schwann cells
 C) oligodendrocytes
 D) astrocytes
- _____ 4) What does the central nervous system use to determine the strength of a stimulus?
 A) origin of the stimulus
 B) type of stimulus receptor
 C) frequency of action potentials
 D) size of action potentials
- _____ 5) Bipolar neurons are commonly _____.
 A) motor neurons
 B) called neuroglial cells
 C) found in ganglia
 D) found in the retina of the eye
- _____ 6) Which of the following is an excitatory neurotransmitter secreted by motor neurons innervating skeletal muscle?
 A) cholinesterase
 B) norepinephrine
 C) acetylcholine
 D) gamma aminobutyric acid
- _____ 7) Which of the following describes the nervous system integrative function?
 A) senses changes in the environment
 B) analyzes sensory information, stores information, makes decisions
 C) responds to stimuli by gland secretion or muscle contraction
- _____ 8) The period after an initial stimulus when a neuron is not sensitive to another stimulus is the _____.
 A) resting period
 B) repolarization
 C) depolarization
 D) absolute refractory period
- _____ 9) Which of the following is not characteristic of neurons?
 A) They conduct impulses.
 B) They have extreme longevity.
 C) They are mitotic.
 D) They have an exceptionally high metabolic rate.
- _____ 10) The part of a neuron that conducts impulses away from its cell body is called a(n) _____.
 A) axon
 B) dendrite
 C) neurolemma
 D) Schwann cell
- _____ 11) Which ion channel opens in response to a change in membrane potential and participates in the generation and conduction of action potentials?
 A) mechanically gated channel
 B) voltage-gated channel
 C) leakage channel
 D) ligand-gated channel
- _____ 12) An impulse from one nerve cell is communicated to another nerve cell via the _____.
 A) cell body
 B) synapse
 C) receptor
 D) effector

- _____ 13) What is the role of acetylcholinesterase?
 A) act as a transmitting agent
 B) amplify or enhance the effect of acetylcholine
 C) destroy acetylcholine a brief period after its release by the axon endings
 D) stimulate the production of acetylcholine
- _____ 14) Which of the following is not a function of the autonomic nervous system?
 A) innervation of smooth muscle of the digestive tract
 B) innervation of cardiac muscle
 C) innervation of glands
 D) innervation of skeletal muscle
- _____ 15) Collections of nerve cell bodies outside the central nervous system are called _____.
 A) nuclei
 B) nerves
 C) ganglia
 D) tracts
- _____ 16) The term central nervous system refers to the _____.
 A) peripheral and spinal nerves
 B) brain, spinal cord, and peripheral nerves
 C) brain and spinal cord
 D) spinal cord and spinal nerves
- _____ 17) The substance released at axon terminals to propagate a nervous impulse is called a(n) _____.
 A) ion
 B) cholinesterase
 C) neurotransmitter
 D) biogenic amine
- _____ 18) A neuron that has as its primary function the job of connecting other neurons is called a(n) _____.
 A) efferent neuron
 B) afferent neuron
 C) association neuron
 D) glial cell
- _____ 19) Saltatory conduction is made possible by _____.
 A) the myelin sheath
 B) large nerve fibers
 C) diphasic impulses
 D) erratic transmission of nerve impulses
- _____ 20) Which of the following is not a chemical class of neurotransmitters?
 A) acetylcholine
 B) amino acid
 C) biogenic amine
 D) ATP and other purines
 E) nucleic acid
- _____ 21) Which of the following is false or incorrect?
 A) An excitatory postsynaptic potential occurs if the excitatory effect is greater than the inhibitory effect but less than threshold.
 B) A nerve impulse occurs if the excitatory and inhibitory effects are equal.
 C) An inhibitory postsynaptic potential occurs if the inhibitory effect is greater than the excitatory, causing hyperpolarization of the membrane.
- _____ 22) Select the correct statement regarding synapses.
 A) Cells with gap junctions use chemical synapses.
 B) The release of neurotransmitter molecules gives cells the property of being electrically coupled.
 C) Neurotransmitter receptors are located on the axons terminals of cells.
 D) The synaptic cleft prevents an impulse from being transmitted directly from one neuron to another.
- _____ 23) Which of the following correctly describes a graded potential?
 A) long distance signaling
 B) amplitude of various sizes
 C) voltage stimulus to initiate
 D) voltage regulated repolarization
- _____ 24) Neuroglia that control the chemical environment around neurons by buffering potassium and recapturing neurotransmitters are _____.
 A) astrocytes
 B) oligodendrocytes
 C) microglia
 D) Schwann cells
- _____ 25) Schwann cells are functionally similar to _____.
 A) ependymal cells
 B) microglia
 C) oligodendrocytes
 D) astrocytes

- _____ 26) Immediately after an action potential has peaked, which cellular gates open?
 A) sodium
 B) chloride
 C) calcium
 D) potassium
- _____ 27) Nerve cell adhesion molecules (N-CAMs) _____.
 A) release nerve growth factor
 B) are found on "pathfinder" neurons
 C) are crucial in the production of neurotransmitters
 D) are crucial for the development of neural connections
- _____ 28) An inhibitory postsynaptic potential (IPSP) is associated with _____.
 A) a change in sodium ion permeability
 B) hyperpolarization
 C) opening of voltage-regulated channels
 D) lowering the threshold for an action potential to occur
- _____ 29) Which of the following will occur when an excitatory postsynaptic potential (EPSP) is being generated on the dendritic membrane?
 A) Specific sodium gates will open.
 B) Specific potassium gates will open.
 C) Sodium gates will open first, then close as potassium gates open.
 D) A single type of channel will open, permitting simultaneous flow of sodium and potassium.
- _____ 30) When a sensory neuron is excited by some form of energy, the resulting graded potential is called a(n) _____.
 A) postsynaptic potential
 B) excitatory potential
 C) action potential
 D) generator potential
- _____ 31) Which of the following is not true of graded potentials?
 A) They are short-lived.
 B) They can form on receptor endings.
 C) They increase amplitude as they move away from the stimulus point.
 D) They can be called postsynaptic potentials.
- _____ 32) Which of the following is true about the movement of ions across excitable living membranes?
 A) Ions always move actively across membranes through leakage channels.
 B) Ions always move passively across membranes.
 C) Sodium gates in the membrane can open in response to electrical potential changes.
 D) Ions always move from an area of higher concentration to an area of lower concentration
- _____ 33) A second nerve impulse cannot be generated until _____.
 A) the membrane potential has been reestablished
 B) the Na ions have been pumped back into the cell
 C) proteins have been resynthesized
 D) all sodium gates are closed
- _____ 34) In what way does the interior surface of a cell membrane of a resting (nonconducting) neuron differ from the external environment? The interior is _____.
 A) positively charged and contains less sodium
 B) negatively charged and contains less sodium
 C) negatively charged and contains more sodium
 D) positively charged and contains more sodium
- _____ 35) If a motor neuron in the body were stimulated by an electrode placed about midpoint along the length of the axon _____.
 A) the impulse would move to the axon terminal only
 B) muscle contraction would occur
 C) the impulse would spread bidirectionally
 D) the impulse would move to the axon terminal only, and the muscle contraction would occur
- _____ 36) Which of the following neurotransmitters inhibits pain and is mimicked by morphine, heroin, and methadone?
 A) acetylcholine
 B) endorphin
 C) serotonin
 D) nitric oxide
- _____ 37) Which of the following describes the excitatory postsynaptic potential?
 A) short distance hyperpolarization
 B) short distance depolarization
 C) opens K⁺ or Cl⁻ channels
 D) moves membrane potential away from threshold

Chapter 12: Central Nervous System:

- _____ 1) Which brain nucleus is the body's "biological clock"?
 A) dorsomedial nucleus
 B) suprachiasmatic nucleus
 C) lentiform nucleus
 D) subthalamic nucleus
- _____ 2) Nuclei of cranial nerves V, VI, and VII are found in the _____.
 A) midbrain
 B) medulla
 C) pons
 D) cerebrum
- _____ 3) The arbor vitae refers to _____.
 A) cerebellar gray matter
 B) cerebellar white matter
 C) the pleat-like convolutions of the cerebellum
 D) flocculonodular nodes
- _____ 4) The brain stem consists of the _____.
 A) cerebrum, pons, midbrain, and medulla
 B) midbrain, medulla, and pons
 C) pons, medulla, cerebellum, and midbrain
 D) midbrain only
- _____ 5) The primary auditory cortex is located in the _____.
 A) prefrontal lobe
 B) frontal lobe
 C) temporal lobe
 D) parietal lobe
- _____ 6) Spinocerebellar tracts _____.
 A) terminate in the spinal cord
 B) carry proprioceptive inputs to the cerebellum
 C) give rise to conscious experience of perception
 D) are found in the dorsal columns of the spinal cord
- _____ 7) What cells line the ventricles of the brain?
 A) ependymal cells
 B) neurons
 C) epithelial cells
 D) astrocytes
- _____ 8) The subarachnoid space lies between what two layers of meninges?
 A) arachnoid and epidura
 B) arachnoid and pia
 C) arachnoid and dura
 D) dura and epidura
- _____ 9) The vital centers for the control of heart rate, respiration, and blood pressure are located in the _____.
 A) pons
 B) medulla
 C) midbrain
 D) cerebrum
- _____ 10) Cell bodies of the sensory neurons of the spinal nerves are located in _____.
 A) the dorsal root ganglia of the spinal cord
 B) the ventral root ganglia of the spinal cord
 C) the thalamus
 D) sympathetic ganglia
- _____ 11) Which fissure separates the cerebral hemispheres?
 A) central fissure
 B) longitudinal fissure
 C) parieto-occipital fissure
 D) lateral fissure
- _____ 12) Which of the following best describes the cerebrum?
 A) motor command center
 B) visceral command center
 C) executive suite
 D) decussation center
- _____ 13) A shallow groove on the surface of the cortex is called a _____.
 A) sulcus
 B) fissure
 C) gyrus
 D) furrow

- _____ 14) Which of the following generalizations does not describe the cerebral cortex?
 A) The cerebral cortex contains three kinds of functional areas.
 B) Each hemisphere is chiefly concerned with sensory and motor functions of the contralateral side of the body.
 C) The hemispheres are exactly equal in function.
 D) No functional area of the cortex works alone.
- _____ 15) If the caudal portion of the neural tube failed to develop properly the _____.
 A) spinal cord may be affected
 B) cranial nerves would not form
 C) hindbrain would not be present
 D) telencephalon would cease development
- _____ 16) The central sulcus separates which lobes?
 A) frontal from parietal
 B) parietal from occipital
 C) temporal from parietal
 D) frontal from temporal
- _____ 17) Neural tracts that convey life-saving information to the brain concerning burning pain would be _____.
 A) anterior spinothalamic
 B) reticulospinal
 C) lateral spinothalamic
 D) posterior spinothalamic
- _____ 18) Which of these would you not find in the cerebral cortex?
 A) cell bodies
 B) dendrites
 C) unmyelinated axons
 D) fiber tracts
- _____ 19) The white matter of the spinal cord contains _____.
 A) myelinated nerve fibers only
 B) unmyelinated nerve fibers only
 C) myelinated and unmyelinated nerve fibers
 D) soma that have both myelinated and unmyelinated nerve fibers
- _____ 20) Which of the following is not a role of the basal nuclei?
 A) regulating attention and cognition
 B) controlling starting and stopping movements
 C) inhibiting unnecessary or antagonistic movements
 D) initiating protective reflex actions
- _____ 21) An individual accidentally transected the spinal cord between T₁ and L₁. This would result in _____.
 A) paraplegia
 B) hemiplegia
 C) quadriplegia
 D) spinal shock only
- _____ 22) Spastic paralysis suggests involvement of the _____.
 A) upper motor neurons
 B) lower motor neurons
 C) spinal nerve roots
 D) neuromotor junction
- _____ 23) Ridges of tissue on the surface of the cerebral hemispheres are called _____.
 A) gyri
 B) sulci
 C) fissures
 D) ganglia
- _____ 24) The frontal lobe is separated from the temporal lobe by the _____.
 A) longitudinal fissure
 B) lateral sulcus
 C) central sulcus
 D) cranial fossa
- _____ 25) Which of the following statements is a false or incorrect statement?
 A) Damage to the primary motor cortex results only in the loss of both voluntary muscle control and reflexes.
 B) Damage to the premotor cortex results in loss of motor skills programmed in that area but movement is still possible.
 C) Damage to the visual association area can result in blindness.
 D) Damage to the primary auditory cortex results in the inability to interpret pitch, loudness, and location.
- _____ 26) Two terms for the massive motor tracts serving voluntary movement are _____.
 A) pyramidal and corticospinal
 B) extrapyramidal and rubrospinal
 C) segmental and nigrostriatal
 D) supplementary and cerebellar-pontine

- _____ 27) An individual who could trace a picture of a bicycle with his or her finger but could not recognize it as a bicycle is most likely to have sustained damage to the _____.
- calcarine cortex
 - primary visual area
 - visual association area
 - lateral geniculate body
- _____ 28) Broca's area _____.
- corresponds to Brodmann's area 8
 - is usually found in the right hemisphere
 - serves the recognition of complex objects
 - is considered a motor speech area
- _____ 29) Which part of the cerebral cortex is involved in intellect, cognition, recall, and personality?
- prefrontal cortex
 - posterior association area
 - limbic association area
 - combined primary somatosensory cortex and somatosensory association cortex
- _____ 30) The blood-brain barrier is effective against _____.
- metabolic waste such as urea
 - nutrients such as glucose
 - alcohol
 - anesthetics
- _____ 31) All of the following are structures of the limbic system except the _____.
- hippocampus
 - cingulate gyrus
 - amygdaloid nucleus
 - caudate nucleus
- _____ 32) The process of linking new facts with old facts already stored in the memory bank is called _____.
- Association
 - automatic memory
 - long-term memory
 - rehearsal
- _____ 33) Which category of memory is involved when playing the piano?
- declarative
 - procedural
 - motor
 - emotional
- _____ 34) The brain area that regulates activities that control the state of wakefulness or alertness of the cerebral cortex is the _____.
- thalamus
 - reticular formation
 - pyramids
 - limbic system
- _____ 35) Which of the following would you not find in normal cerebrospinal fluid?
- glucose
 - red blood cells
 - potassium
 - protein
- _____ 36) REM sleep is associated with _____.
- decreased vital signs, such as heart rate and blood pressure
 - decreased activity of the brain, especially the cerebral cortex
 - temporary skeletal muscle inhibition except for ocular muscles and diaphragm
 - decreased oxygen use, especially in the cerebral cortex
- _____ 37) Which of the following is not a function of the CSF?
- reduction of brain weight
 - protection from blows
 - nourishment of the brain
 - initiation of some nerve impulses
- _____ 38) Injury to the hypothalamus may result in all of the following except _____.
- pathologic sleep
 - loss of body temperature control
 - production of excessive quantities of urine
 - loss of proprioception
- _____ 39) Important nuclei of the indirect (multineural) system that receive impulses from the equilibrium apparatus of the inner ear and help to maintain balance by varying muscle tone of postural muscles are the _____.
- red nuclei
 - vestibular nuclei
 - reticular nuclei
 - superior colliculi

- _____ 40) Which of the following structures is probably not directly involved in memory?
 A) hippocampus
 B) medulla
 C) thalamus
 D) prefrontal cortex
- _____ 41) The area of the cortex that is responsible for sensations of the full bladder and the feeling that your lungs will burst when you hold your breath too long is the _____.
 A) olfactory cortex
 B) gustatory cortex
 C) vestibular cortex
 D) visceral sensory area
- _____ 42) Which statement about coma is true?
 A) Coma may be caused by widespread cerebral or brain stem trauma.
 B) During coma, brain oxygen consumption resembles that of a waking state.
 C) Coma is neurologically identical to syncope.
 D) Coma is a form of deep sleep.
- _____ 43) Tremor at rest, shuffling gait, stooped posture, and expressionless face are characteristics of _____.
 A) Huntington's disease
 B) Parkinson's disease
 C) cerebellar disease
 D) spinal cord disease
- _____ 44) Which of the following is the mildest consequence of traumatic brain injury?
 A) contusion
 B) concussion
 C) hemorrhage
 D) swelling
- _____ 45) Declarative memory _____.
 A) is the ability to learn specific information
 B) is best remembered in the doing
 C) is hard to unlearn when learned once
 D) usually involves motor skills
- _____ 46) Which of the following is (are) involved with motor activity (either initiation or coordination)?
 A) postcentral gyrus
 B) gustatory cortex
 C) red nuclei
 D) Wernicke's area
- _____ 47) Which statement is not true?
 A) Sleep requirements decline from infancy to early adulthood, level off, then decline again in old age.
 B) Half of infant sleep is composed of REM sleep.
 C) Ten-year-olds are in REM sleep about 1.5-2 hours per night.
 D) Stage 4 sleep increases in old age.
- _____ 48) Which statement about epilepsy is most accurate?
 A) During seizures, sensory messages are processed normally but responses are blocked.
 B) Absence seizures typically begin in adolescence and is often severely disabling.
 C) Epilepsy is often genetically induced but also frequently caused by head trauma, stroke, infection, and tumor.
 D) The aura in tonic-clonic seizures typically occurs as the patient regains consciousness.
- _____ 49) White matter is found in all of the following locations except the _____.
 A) corpus callosum
 B) cerebral cortex
 C) corticospinal tracts
 D) outer portion of the spinal cord
- _____ 50) Second-order neurons of both the specific and nonspecific ascending pathways terminate in the _____.
 A) spinal cord
 B) medulla
 C) thalamus
 D) somatosensory cortex
- _____ 51) Loss of ability to perform skilled motor activities such as piano playing, with no paralysis or weakness in specific muscles, might suggest damage to the _____.
 A) spinal cord
 B) premotor cortex
 C) primary motor cortex
 D) rubrospinal tracts
- _____ 52) Which brain waves are not normal for awake adults but are common for children?
 A) Alpha
 B) Beta
 C) Delta
 D) Theta

Chapter 13: Peripheral Nervous System:

- _____ 1) The patellar "knee jerk" reflex is an example of a(n) _____.
- extensor thrust reflex
 - stress reflex
 - crossed-extensor reflex
 - stretch reflex
- _____ 2) The _____ nerve is not a branch of the trigeminal nerve.
- ophthalmic
 - maxillary
 - cervical
 - mandibular
- _____ 3) Which of the following nerves does not arise from the brachial plexus?
- median
 - phrenic
 - radial
 - ulnar
- _____ 4) Which of the following is not a way that sensory receptors are classified?
- type of stimulus detected
 - location in the body
 - structural complexity
 - sensitivity to a stimulus
- _____ 5) Which of the following is not a main level of neural integration in the somatosensory system?
- receptor
 - circuit
 - segmental
 - perceptual
- _____ 6) The posterior side of the thigh, leg, and foot is served by the _____ nerve.
- obturator
 - common fibular
 - tibial
 - femoral
- _____ 7) Starting at the spinal cord, the subdivisions of the brachial plexus are (in order):
- roots, trunks, divisions, and cords
 - roots, divisions, cords, and trunks
 - divisions, roots, trunks, and cords
 - trunks, divisions, cords, and roots
- _____ 8) The cranial nerve with a cervical origin (spinal cord) is the _____.
- hypoglossal
 - accessory
 - vagus
 - glossopharyngeal
- _____ 9) Which of the following is an incorrect statement regarding the occurrence of a sensation?
- The stimulus energy must match the specificity of the receptor.
 - The stimulus energy must occur within the receptor's receptive field.
 - The stimulus energy must be converted into the energy of a graded potential called a transduction potential.
 - A generator potential in the associated sensory neuron must reach threshold.
- _____ 10) A major nerve of the lumbar plexus is the _____.
- femoral
 - iliohypogastric
 - sciatic
 - ilioinguinal
- _____ 11) Spinal nerves exiting the cord from the level of L₄ to S₄ form the _____.
- lumbar plexus
 - femoral plexus
 - sacral plexus
 - thoracic plexus
- _____ 12) Inborn or intrinsic reflexes are _____.
- rapid, predictable, and can be learned responses
 - involuntary, yet may be modified by learned behavior
 - autonomic only
 - always mediated by the brain

- _____ 13) Which of the following is not an aspect of sensory perception?
 A) magnitude estimation
 B) spatial discrimination
 C) feature abstraction
 D) visceral identification
 E) pattern recognition
- _____ 14) Striking the "funny bone" is actually stimulation of (or injury to) the _____.
 A) radial nerve
 B) sciatic nerve
 C) ulnar nerve
 D) median nerve
- _____ 15) A reflex that causes muscle relaxation and lengthening in response to muscle tension is called a _____.
 A) tendon reflex
 B) flexor reflex
 C) crossed-extensor reflex
 D) plantar reflex
- _____ 16) Pressure, pain, and temperature receptors in the skin are _____.
 A) interoceptors
 B) exteroceptors
 C) proprioceptors
 D) mechanoreceptors
- _____ 17) Potentially damaging stimuli that result in pain are selectively detected by _____.
 A) interoceptors
 B) photoreceptors
 C) nociceptors
 D) proprioceptors
- _____ 18) Which receptors adapt most slowly?
 A) smell receptors
 B) pressure receptors
 C) nociceptors
 D) touch receptors
- _____ 19) Nerves that carry impulses toward the CNS only are _____.
 A) afferent nerves
 B) efferent nerves
 C) motor nerves
 D) mixed nerves
- _____ 20) After axonal injury, regeneration in peripheral nerves is guided by _____.
 A) Wallerian cells
 B) Schwann cells
 C) dendrites
 D) Golgi organs
- _____ 21) Regeneration within the CNS _____.
 A) is more successful than with the PNS
 B) typically allows axonal sprouting of 20 mm
 C) is prevented due to growth-inhibiting proteins of oligodendrocytes
 D) is promoted by growth inhibitors and glial scars
- _____ 22) In a crossed-extensor reflex, if the right arm was grabbed it would flex and the left arm would _____.
 A) also flex
 B) extend
 C) abduct
 D) adduct
- _____ 23) Select the correct definition.
 A) Magnitude estimation is the simplest level of sensation.
 B) Perceptual detection is the ability to detect how much stimulus is applied to the body.
 C) Pattern recognition allows us to see a familiar face.
 D) Spatial discrimination allows us to recognize textures.
- _____ 24) All processing at the circuit level going up to the perceptual level must synapse in the _____.
 A) pons
 B) thalamus
 C) reticular formation
 D) medulla
- _____ 25) The sciatic nerve is a combination of which two nerves?
 A) pudendal and posterior femoral cutaneous
 B) posterior femoral cutaneous and tibial
 C) pudendal and common fibular
 D) common fibular and tibial

- _____ 26) Which nerve is compressed in carpal tunnel syndrome?
 A) median
 B) axillary
 C) radial
 D) ulnar
- _____ 27) Bell's palsy is _____.
 A) characterized by partial paralysis of diaphragm muscles
 B) characterized by loss of vision
 C) often caused by inflammation of the trigeminal nerve
 D) characterized by paralysis of facial muscles
- _____ 28) Which of the following is the correct simple spinal reflex arc?
 A) effector, afferent neuron, integration center, efferent neuron, receptor
 B) receptor, afferent neuron, integration center, efferent neuron, effector
 C) effector, efferent neuron, integration center, afferent neuron, receptor
 D) receptor, efferent neuron, integration center, afferent neuron, effector
- _____ 29) Mixed cranial nerves containing both motor and sensory fibers include all except which of the following?
 A) oculomotor
 B) olfactory
 C) trigeminal
 D) facial
- _____ 30) Transduction refers to conversion of _____.
 A) presynaptic nerve impulses to postsynaptic nerve impulses
 B) stimulus energy into energy of a graded potential
 C) receptor energy to stimulus energy
 D) afferent impulses to efferent impulses
- _____ 31) The flexor muscles in the anterior arm (biceps brachii and brachialis) are innervated by what nerve?
 A) radial
 B) median
 C) ulnar
 D) musculocutaneous
- _____ 32) The cranial nerves that have neural connections with the tongue include all except the _____.
 A) trigeminal
 B) facial
 C) glossopharyngeal
 D) trochlear
- _____ 33) Problems in balance may follow trauma to which nerve?
 A) abducens
 B) vestibulocochlear
 C) trigeminal
 D) accessory
- _____ 34) A fracture of the ethmoid bone could result in damage to which cranial nerve?
 A) glossopharyngeal
 B) vagus
 C) olfactory
 D) accessory
- _____ 35) Select the statement that is most correct.
 A) Ganglia are collections of neuron cell bodies in the spinal cord that are associated with efferent fibers.
 B) Ganglia associated with afferent nerve fibers contain cell bodies of sensory neurons.
 C) The dorsal root ganglion is a motor-only structure.
 D) The cell bodies of afferent ganglia are located in the spinal cord.
- _____ 36) A fall or an improperly delivered gluteal injection could result in _____.
 A) neurofibromatosis
 B) postpoliomyelitis muscular atrophy
 C) phantom limb pain
 D) sciatica
- _____ 37) Feeling a gentle caress on your arm would likely involve all of the following except _____.
 A) Meissner's corpuscles
 B) tactile discs
 C) Pacinian corpuscles
 D) hair follicle receptors
- _____ 38) A patient who received a blow to the side of the skull exhibits the following signs and symptoms on that side of the face: he is unable to close his eye, and the corner of his mouth droops. Which cranial nerve has been damaged?
 A) facial
 B) glossopharyngeal
 C) hypoglossal
 D) accessory

Chapter 14: Autonomic Nervous System:

- _____ 1) The secretions of the adrenal medulla act to supplement the effects of _____.
- parasympathetic innervation
 - sympathetic stimulation
 - vagus nerve activity
 - neurosecretory substances
- _____ 2) Which of the following does not describe the ANS?
- a system of motor neurons that innervates smooth and cardiac muscle and glands
 - a system of motor neurons that innervates all muscle cells
 - involuntary nervous system
 - general visceral motor system
- _____ 3) Preparing the body for the "fight-or-flight" response is the role of the _____.
- sympathetic nervous system
 - cerebrum
 - parasympathetic nervous system
 - somatic nervous system
- _____ 4) The somatic and autonomic nervous systems differ in all of the following except _____.
- their effectors
 - their efferent pathways
 - to some degree in target responses to their neurotransmitters
 - all of the neurotransmitters
- _____ 5) Where would you not find a cholinergic nicotinic receptor?
- all parasympathetic target organs
 - all postganglionic neurons
 - adrenal medulla hormone producing cells
 - skeletal muscle motor end plates
- _____ 6) The parasympathetic ganglion that serves the eye is the _____.
- ciliary ganglion
 - pterygopalatine ganglion
 - submandibular ganglion
 - otic ganglion
- _____ 7) Cardiovascular effects of the sympathetic division include all except _____.
- constriction of most blood vessels
 - dilation of the vessels serving the skeletal muscles
 - increase of heart rate and force
 - dilation of the blood vessels serving the skin and digestive viscera
- _____ 8) Over 90% of all parasympathetic fibers are derived from cranial nerve number _____.
- V
 - VII
 - X
 - XII
- _____ 9) The "resting and digesting" division of the autonomic nervous system is the _____.
- parasympathetic division
 - sympathetic division
 - somatic division
 - peripheral nervous system
- _____ 10) Control of temperature, endocrine activity, and thirst are functions associated with the _____.
- medulla
 - cerebellum
 - hypothalamus
 - thalamus
- _____ 11) Which of these effectors is not directly controlled by the autonomic nervous system?
- smooth muscle
 - cardiac muscle
 - skeletal muscle
 - most glands
- _____ 12) Which of the following is not a result of parasympathetic stimulation?
- salivation
 - dilation of the pupils
 - increased peristalsis of the digestive viscera
 - elimination of urine
- _____ 13) Which of the following statements is not true?
- Sympathetic origin is craniosacral; parasympathetic is thoracolumbar.
 - Sympathetic ganglia are within a few centimeters of the CNS; parasympathetic are close to visceral organs served.
 - Sympathetic division has short preganglionic and long postganglionic fibers; parasympathetic has long preganglionic and short postganglionic fibers.
 - Sympathetic has extensive branching of preganglionic fibers; parasympathetic has minimal branching of preganglionic fibers.

- _____ 14) Sympathetic responses generally are widespread because _____.
- A) inactivation of acetylcholine is fairly slow
 - B) NE and epinephrine are secreted into the blood as part of the sympathetic response
 - C) preganglionic fibers are short
 - D) preganglionic fibers are long
- _____ 15) Sympathetic nerves may leave the spinal cord at which vertebra?
- A) second cervical
 - B) third lumbar
 - C) first coccyx
 - D) first thoracic
- _____ 16) Autonomic ganglia contain _____.
- A) an outer connective tissue capsule around the cell bodies of preganglionic motor neurons
 - B) synapses between postganglionic fibers and their effectors
 - C) the cell bodies of motor neurons
 - D) both somatic afferent and efferent neurons
- _____ 17) The parasympathetic fibers of the _____ nerves innervate smooth muscles of the eye that cause the lenses to bulge to accommodate close vision.
- A) optic
 - B) oculomotor
 - C) trochlear
 - D) abducens
- _____ 18) Fibers that enter and leave the sympathetic chain without synapsing form structures called _____.
- A) white rami communicantes
 - B) gray rami communicantes
 - C) spinal nerves
 - D) splanchnic nerves
- _____ 19) Which of the following is not a plexus of the vagus nerve?
- A) cardiac
 - B) pulmonary
 - C) celiac
 - D) esophageal
- _____ 20) Visceral reflex arcs differ from somatic in that _____.
- A) visceral arcs contain two sensory neurons
 - B) somatic arcs contain one additional component that visceral arcs do not possess
 - C) visceral arcs involve two motor neurons
 - D) visceral arcs do not use integration centers
- _____ 21) The parasympathetic tone _____.
- A) prevents unnecessary heart deceleration
 - B) accelerates activity of the digestive tract
 - C) determines normal activity of the urinary tract
 - D) causes blood pressure to rise
- _____ 22) Once a sympathetic preganglionic axon reaches a trunk ganglion, it can do all but which one of the following?
- A) synapse with a parasympathetic neuron in the same trunk ganglion
 - B) synapse with a ganglionic neuron in the same trunk ganglion
 - C) ascend or descend the trunk to synapse in another trunk ganglion
 - D) pass through the trunk ganglion without synapsing with another neuron
- _____ 23) Which of the following appears to exert the most direct influence over autonomic function?
- A) hypothalamus
 - B) midbrain
 - C) reticular formation
 - D) medulla oblongata
- _____ 24) Beta-blockers _____.
- A) increase a dangerously low heart rate
 - B) decrease heart rate and blood pressure
 - C) have widespread sympathetic effects
 - D) are potent antidepressants
- _____ 25) Erection of the penis or clitoris _____.
- A) is primarily under sympathetic control
 - B) is primarily under parasympathetic control
 - C) is the result of coordinated activation by both sympathetic and parasympathetic input
 - D) depends very little on autonomic activation
- _____ 26) Which is a uniquely sympathetic function?
- A) regulation of pupil size
 - B) regulation of cardiac rate
 - C) regulation of respiratory rate
 - D) regulation of body temperature

- _____ 27) Raynaud's disease _____.
- A) is characterized by exaggerated vasoconstriction in the extremities
 - B) is induced by heat stress
 - C) occurs primarily in association with injury to the spinal cord
 - D) is frequently life threatening
- _____ 28) Autonomic dysreflexia _____.
- A) is also known as autonomic areflexia
 - B) involves uncontrolled activation of autonomic neurons
 - C) usually precedes spinal shock
 - D) results from over-excitatory input from the cortex
- _____ 29) Which sympathetic fibers form a splanchnic nerve?
- A) those that synapse with parasympathetic fibers
 - B) those that synapse in the same trunk ganglion they entered
 - C) those that synapse with somatic fibers
 - D) those that pass through the trunk ganglion to synapse in collateral or prevertebral ganglia
- _____ 30) Which of the following adrenergic neurotransmitter receptors plays the major role in heart activity?
- A) beta 1
 - B) beta 2
 - C) beta 3
 - D) alpha 1
- _____ 31) Where would you not find an autonomic ganglion?
- A) in the head
 - B) in the cervical region
 - C) close to the visceral effectors they serve
 - D) in the armpit
- _____ 32) Sympathetic division stimulation causes _____.
- A) decreased blood glucose, increased GI peristalsis, and increased heart rate and blood pressure
 - B) increased blood glucose, increased GI peristalsis, and decreased heart rate and blood pressure
 - C) increased blood glucose, decreased GI peristalsis, and increased heart rate and blood pressure
 - D) decreased blood glucose, increased GI peristalsis, and decreased heart rate and blood pressure
- _____ 33) The smooth muscle of the digestive viscera is served largely by the _____.
- A) lumbar splanchnic nerves
 - B) cephalic plexus
 - C) pelvic nerves
 - D) tenth cranial nerve
- _____ 34) The route of major parasympathetic outflow from the head is via the _____.
- A) sympathetic trunk
 - B) phrenic nerve
 - C) vagus nerve
 - D) sacral nerve
- _____ 35) Parasympathetic functions include _____.
- A) a stimulation of heart rate and force of contraction
 - B) allowing the body to cope with an external threat
 - C) lens accommodation for close vision
 - D) mobilizing storage energy sources
- _____ 36) Emotions influence autonomic reactions primarily through integration in the _____.
- A) lateral horn of the spinal cord
 - B) hypothalamus
 - C) lateral geniculate of the thalamus
 - D) inferior colliculus