

**A&P I Exam 1:** Ch.1: The Human Body, Ch.2: Chemistry, Ch. 3: Cell A&P

*After reading each question and all possible answers, write the letter of the best answer to each question on your answer sheet.*

- 1) The study of the structure of body parts and their relationships to one another is known as
  - a) Structurology
  - b) Physiology
  - c) **Anatomy**
  - d) Histology
  
- 2) The study of the function of the body and all its organs, organs systems, chemicals, tissues, and cells is known as
  - a) Functionology
  - b) **Physiology**
  - c) Anatomy
  - d) Cytology
  
- 3) The study of cells is known as
  - a) Histology
  - b) **Cytology**
  - c) Systemic Anatomy
  - d) Embryology
  
- 4) The Principle of Complementarity is a major theme of Anatomy and Physiology which states that
  - a) Life always depends on non-life
  - b) Chemical bonding always depends on chemical make-up
  - c) Cells always depend on their tissues
  - d) **Function always depends on structure**
  
- 5) Which of the following lists shows the levels of structural organization from smallest to largest?
  - a) Organ, Tissue, Organ system, Organism, Cellular, Chemical
  - b) **Chemical, Cellular, Tissue, Organ, Organ system, Organism**
  - c) Organism, Organ system, Organ, Tissue, Cellular, Chemical
  - d) Chemical, Cellular, Tissue, Organism, Organ system, Organ
  
- 6) The organ system which forms the external body covering and is composed of skin, sweat glands, oil glands, hair, and nails is the
  - a) Nervous system
  - b) Digestive System
  - c. Lymphatic System
  - d. **Integumentary System**
  
- 7) The organ system which is composed of the nasal cavity, pharynx, trachea, bronchi, and lungs and which supplies O<sub>2</sub> and removes CO<sub>2</sub> from the blood is the
  - a) **Respiratory system**
  - b) Digestive system
  - c. Endocrine system
  - d. Integumentary system
  
- 8) The main function of the nervous system is to
  - a) **respond to stimuli by activating muscles and glands through electrical and chemical impulses**
  - b) protect deep tissues from injury and synthesize vitamin D
  - c) pick up fluid leaked from blood vessels and return it to blood or disposes of it
  - d) break down food into absorbable units which enter the blood

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- 9) Homeostasis is
- a) maintenance of a relatively stable internal environment maintained by continuously responding to changes in the outside world
  - b) a dynamic state of equilibrium
  - c) a state which involves chemical, thermal, and neural factors
  - d) **all of the above**
- 10) In any homeostatic control process, which of the following enacts the actual response to the stimulus, either reinforcing or reduces the stimulus?
- a) Control center
  - b) **Effector**
  - c) Receptor
  - d) Responder
- 11) Which of the following is an example of a positive feedback mechanism?
- a) shivering when you're cold to warm up
  - b) **ever-increasing frequency of contractions during childbirth**
  - c) eating something when you're hungry to stop the hunger pangs
  - d) falling asleep when your body is tired to become more rested
- 12) Which of the following is an example of a homeostatic imbalance?
- a) shivering to warm up
  - b) blood clotting to form a scab
  - c) **developing insulin resistance so your body does not regulate blood sugar; diabetes**
  - d) pH buffering to neutralize an unhealthy rise in blood pH
- 13) Which of the following is NOT a basic life function?
- a) separation from the outside world
  - b) ability to sense and respond to stimuli
  - c) breakdown of ingested foodstuffs
  - d) **self-awareness**
  - e. metabolism
  - f. reproduction
  - g. growth
- 14) Why is atmospheric pressure a basic survival need?
- a) Our metabolism can't happen without it
  - b) It allows us to maintain our temperature
  - c) It provides nutrients to us
  - d) **It allows us to inhale properly**
- 15) The eyes are \_\_\_\_\_ compared to the chin.
- a) anterior
  - b) posterior
  - c. inferior
  - d. **superior**
- 16) Anterior is just another way of saying \_\_\_\_\_ and means towards the belly.
- a) **ventral**
  - b) dorsal
  - c. medial
  - d. lateral
- 17) The fingers are \_\_\_\_\_ compared to the wrist.
- a) superficial
  - b) deep
  - c. proximal
  - d. **distal**

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- 18) The bones and muscles are \_\_\_\_\_ compared to the skin.  
a) superficial                      c. proximal  
b) **deep**                              d. distal
- 19) The nose is in the \_\_\_\_\_ region.  
a) Orbital                              c. **nasal**  
b) Mental                              d. oral
- 20) The upper arm is in the \_\_\_\_\_ region.  
a) **brachial**                              c. antebrachial  
b) palmar                              d. popliteal
- 21) Of the nine abdominopelvic regions, which one is found to the upper-left of the umbilical region?  
a) Left Hypogastric                      c. Left Iliac  
b) Left Lumbar                              **d. Left Hypochondriac**
- 22) The front of the knee is known as the \_\_\_\_\_ region  
a) popliteal                              c. femoral  
b) **patellar**                              d. fibular
- 23) The finger and toe regions are both known as \_\_\_\_\_ regions.  
a) Hallux                              c. Palmar  
b) **Digital**                              d. Plantar
- 24) The region of the foot which faces the floor most often is the  
a) Perineal region                      c. Metatarsal region  
b) **Plantar region**                      d. Tarsal region
- 25) The body cavity which encloses the heart is the  
a) **Pericardial cavity**                      c. Pelvic Cavity  
b) Pleural cavity                      d. Cranial cavity
- 26) If the body were cut into superior and inferior parts, we would have a(n)  
a) Oblique section                      c. midsagittal section  
b) Sagittal section                      d. **transverse/horizontal section**
- 27) If the body were cut exactly down the middle into left and right parts, we'd have a(n)  
a) Oblique section                      c. **midsagittal section**  
b) Sagittal section                      d. transverse/horizontal section
- 28) A speeding bullet is an example of an object which has a lot of  
a) Potential energy                      c. Electromagnetic energy  
b) Chemical Energy                      **d. Kinetic Energy**
- 29) A circus performer on an extremely high platform who will soon dive into a bucket of water (but who has not yet dived) has a lot of  
a) Potential energy                      c. Electromagnetic energy  
b) Electrical Energy                      **d. Kinetic Energy**

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- 30) Chemical energy stored in glucose is a type of
- a) **Potential energy**
  - b) **Chemical Energy**
  - c. Electromagnetic energy
  - d. Kinetic energy
- 31) The state of matter which has a constant volume but changeable shape is
- a) Solid
  - b) **Liquid**
  - c. gas
  - d. plasma
- 32) The air in this room is composed of O<sub>2</sub>, CO<sub>2</sub>, N<sub>2</sub>, and dozens of other types of gasses. This means that the air in this room is a(n)
- a) Element
  - b) Compound
  - c. Pure substance
  - d. **Mixture**
- 33) Which of the following is NOT a subatomic particle?
- a) **Ion**
  - b) Proton
  - c. Neutron
  - d. Electron
- 34) Choose the list which shows the objects in order from LARGEST to smallest.
- a) Atom, electron, proton, cell, molecule, macromolecule
  - b) Electron, proton, atom, molecule, macromolecule, cell
  - c) **Cell, macromolecule, molecule, atom, proton, electron**
  - d) Cell, macromolecule, atom, molecule, proton, electron
- 35) Carbon-12 atoms have 6 protons and 6 neutrons. Carbon-13 atoms have 6 protons and 7 neutrons. This means that carbon-12 and carbon-13 are \_\_\_\_\_ of carbon.
- a) Elements
  - b) Compounds
  - c. Ions
  - d. **Isotopes**
- 36) When more than one element chemically bonds together, they form
- a) über elements
  - b) **compounds**
  - c. mixtures
  - d. isotopes
- 37) An extremely well-mixed, homogenous mixture whose separate parts are not visible, like lemonade (without lemons or pulp in it) is a
- a) Pure substance
  - b) Colloid
  - c. Suspension
  - d. **Solution**
- 38) In hummingbird food (which is basically sugar water),
- a) Sugar is the concentrate and water is the dilute
  - b) Water is the concentrate and sugar is the dilute
  - c) **Water is the solvent and sugar is the solute**
  - d) Sugar is the solvent and water is the solute
- 39) Most elements would like to have \_\_\_\_\_ valence electrons, because that number of valence electrons makes them very stable.
- a) 2
  - b) 6
  - c. **8**
  - d. 15

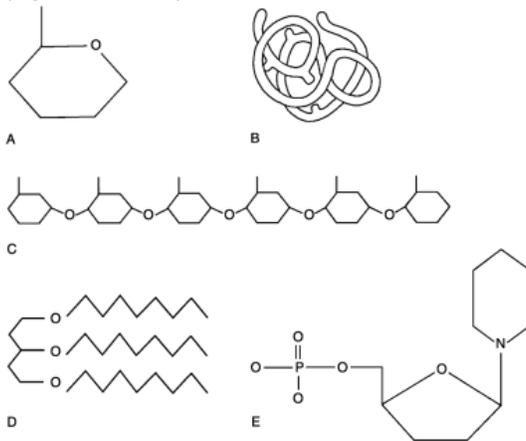
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- 40) The type of chemical bonding which is not easily broken by water and which involves *sharing* valence electrons is
- a) Van der Waals bonding
  - b) **Covalent bonding**
  - c) Ionic bonding
  - d) Hydrogen bonding
- 41) The type of bond which is simply a weak attraction between polar molecules (like water molecules) is
- a) Van der Waals bonding
  - b) Covalent bonding
  - c) Ionic bonding
  - d) **Hydrogen bonding**
- 42) When two or more atoms *gain or lose* valence electrons, becoming positively and negatively charged, and then becoming attracted to each other because of those opposite charges?
- a) Van der Waals bonding
  - b) Covalent bonding
  - c) **Ionic bonding**
  - d) Hydrogen bonding
- 43) Choose the equation which best represents a decomposition reaction.
- a)  $A + B \rightarrow AB$
  - b)  **$AB \rightarrow A + B$**
  - c)  $AB + D \rightarrow AD + B$
  - d)  $AB + CD \rightarrow AD + CB$
- 44) If separate sodium atoms and chlorine atoms were to bond to become sodium chloride crystals, what kind of chemical reaction would that be?
- a) Decomposition
  - b) Single replacement
  - c. **Synthesis**
  - d. Double replacement
- 45) A reaction which releases a lot of energy when it occurs is known as a(n)
- a) Endothermic reaction
  - b) Endergonic reaction
  - c) Exothermic reaction
  - d) Exergonic reaction
  - e. both a and b
  - f. both c and d**
- 46) Which of the following would make a chemical reaction proceed more QUICKLY?
- a) Low concentration of reactants
  - b) **High temperature**
  - c) Large particle size
  - d) Absence of reaction-specific enzymes
- 47) Which of the following would make a chemical reaction proceed more SLOWLY?
- a) **Low concentration of reactants**
  - b) High temperature
  - c) Small particle size
  - d) Presence of reaction-specific enzymes
- 48) Substances which form H<sup>+</sup> ions in water, are sour, and have a low pH are known as
- a) Buffers
  - b) Salts
  - c) Catalysts
  - d. **Acids**
  - e. Bases

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- 49) Weak acid and weak base systems whose function in the body is to resist large or sudden changes in pH are known as
- a) **Buffers**
  - b) Salts
  - c. Catalysts
  - d. Acids
  - e. Bases
- 50) The main role of salts in the body is to form electrolytes like  $K^+$ ,  $Na^+$ ,  $Ca^{2+}$ , and  $Cl^-$ , electrolytes which serve the purpose of
- a) storing and interpreting genetic information
  - b) transmitting nerve impulses to control a variety of body actions**
  - c) breaking down nutrients into absorbable parts
  - d) defending the body against disease
- 51) Which of the following properties of water plays the biggest role in maintaining a steady body temperature?
- a) Polar solvency
  - b) Reactivity
  - c) Cushioning
  - d. **High heat capacity**
  - e. High heat of vaporization
- 52) If water's very unique chemical properties were reduced or disappeared, we would
- a) have to sweat a lot more to cool ourselves off.
  - b) not be able to break down organic macromolecules through hydrolysis.
  - c) not be able to move around much because our brain and other internal organs would be bruised against our own bones
  - d) cease to live because our metabolism would grind to a screeching halt
  - e) all of the above**
  - f) none of the above
- 53) The main function of enzymes is to \_\_\_\_\_ reactions, during which they are \_\_\_\_\_.
- a) Speed up, used up
  - b) **Speed up, not used up**
  - c. slow down, used up
  - d. slow down, not used up

Use the figure below for the next two items.



- 54) Which of the above shows a globular protein? **B**
- 55) Which of the above shows a nucleotide? **E**

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- 56) Which of the following is NOT one of the four major types of organic macromolecules?
- a) **Hydrocarbons**
  - b) Carbohydrates
  - c) Proteins
  - d. Lipids
  - e. Nucleic Acids
- 57) Which of the four major types of organic macromolecules has the widest diversity of functions in the body?
- a) Hydrocarbons
  - b) Carbohydrates
  - c) Proteins**
  - d. Lipids
  - e. Nucleic Acids
- 58) Which of the four major types of organic macromolecules is used mainly as a source of energy and has building blocks called monosaccharides?
- a) Hydrocarbons
  - b) Carbohydrates**
  - c) Proteins
  - d. Lipids
  - e. Nucleic Acids
- 59) DNA and RNA are both types of
- a) Hydrocarbon
  - b) Carbohydrate
  - c) Protein
  - d. Lipid
  - e. Nucleic Acid**
- 60) Which of the four major types of organic macromolecules can be used to store energy, is often composed of fatty acids, is not very soluble in water, and forms the majority of our cells' plasma membranes?
- a) Hydrocarbons
  - b) Carbohydrates
  - c) Proteins
  - d. Lipids**
  - e. Nucleic Acids
- 61) If a DNA strand had triplets reading AGC TAT TTG, what would the matching DNA strand read?
- a) TUT TTT GUA
  - b) AGC TAT TTG**
  - c) UCG AUA AAC
  - d) TCG ATA AAC**
- 62) If a DNA strand had triplets reading AGC TAT TTG, what would the matching mRNA strand read?
- a) AGC UAU UUG
  - b) AGC TAT TTG
  - c) UCG AUA AAC**
  - d) TCG ATA AAC
- 63) Which of the following is considered to be an organic compound?
- a) Hydrogen (H<sub>2</sub>)
  - b) Glucose (C<sub>6</sub>H<sub>12</sub>O<sub>8</sub>)**
  - c) Oxygen (O<sub>2</sub>)
  - d) Potatoes grown by hand with cow manure fertilizer and no pesticides

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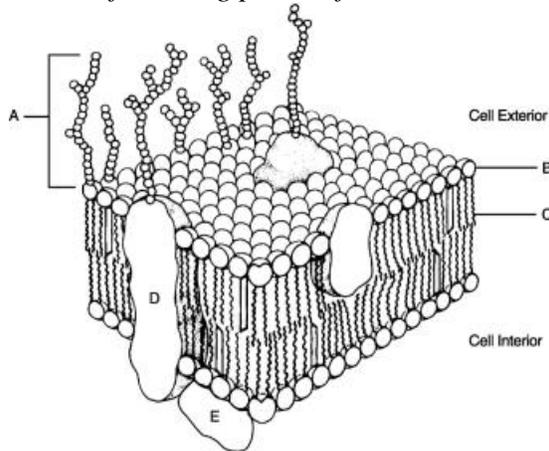
64) The main function of Adenosine Triphosphate (ATP) is to provide cells with

- a) **Energy**
- b) Nutrients
- c. Electrical signaling molecules
- d. Chemical signaling molecules

65) According to *Cell Theory*, the structure and function of the human body depends most basically upon the structure and function of its

- a) molecules
- b) organs
- c. tissues
- d. cells**

Use the following picture for the next three items.



66) Which of the above letters indicates the glycocalyx? **A**

67) Which of the above letters indicates a phospholipid? **B or C**

68) Which of the above letters indicates a transmembrane glycoprotein? **D**

69) Which of the following serves to anchor the sugars of the glycocalyx?

- a) Glycoproteins
- b) Glycolipids
- c. **just a & b**
- d. just b & c

70) Which of the following allows diffusion of molecules through the cell membrane?

- a) **Channel proteins**
- b) Peripheral Proteins
- c. Glycocalyx
- d. Catalysts

71) Which of the following functions in cell/cell recognition, as when a human sperm recognizes a human egg?

- a) Channel proteins
- b) Peripheral Proteins
- c. **Glycocalyx**
- d. Catalysts

72) One main function of the plasma membrane is to

- a) Synthesize ribosomes
- b) Synthesize proteins
- c. **Control substances coming in and out of the cell**
- d. Separate the nucleus from the rest of the cell

73) Diffusion is the tendency of fluids to move from

- a) Low concentration to high concentration areas
- b) Outer areas to inner areas
- c) Inner areas to outer areas
- d) High concentration areas to low concentration areas**

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74) Facilitated diffusion requires

- a) **Channel proteins**
- b) A sodium-potassium pump
- c. Peripheral proteins
- d. Glycoproteins

75) In a hypotonic solution, a cell will

- a) Stay the same size
- b) **Expand in volume**
- c. decrease in volume
- d. change color

76) If an *ion* is much more concentrated inside of a cell than outside of a cell, *water* will diffuse down its osmotic gradient by

- a) flowing around the cell.
- b) avoiding the cell completely.
- c. **flowing into the cell.**
- d. flowing out of the cell.

77) Active transport requires the cell to \_\_\_\_\_ to move substances across the membrane.

- a) Do nothing
- b) **Spend cell energy**
- c. Contract
- d. Expand

78) Because it requires ATP and moves substances against their chemical concentration gradient, the  $\text{Na}^+ - \text{K}^+$  pump is a(n) \_\_\_\_\_ transport mechanism.

- a) Intercellular
- b) Vesicular
- c. Passive
- d. **Active**

79) The average resting membrane potential of the cell is  $-70\text{mV}$ . This means that there is a slight \_\_\_\_\_ charge across the membrane.

- a) Chemical
- b) Kinetic
- c. Electromagnetic
- d. **Electrical**

80) The membrane potential would eventually come to zero if it was not **maintained** by the action of

- a)  $\text{K}^+$  ions flowing out of the cell
- b)  $\text{Na}^+$  ions flowing into the cell
- c)  $\text{K}^+$  ions flowing back into the cell
- d) **the  $\text{Na}^+ - \text{K}^+$  pump**

81) The general term for bringing large substances into the cell by vesicular transport is

- a) Transcytosis
- b) **Endocytosis**
- c. Exocytosis
- d. Phagocytosis

82) The process whereby cells use pseudopods to bring large solid particles inside the cell is called

- a) Transcytosis
- b) Endocytosis
- c. Receptor-mediated endocytosis
- d. **Phagocytosis**

83) The protein most commonly used in receptor-mediated endocytosis is

- a) Caveolin
- b) Defensin
- c) Bringemonin
- d) **Clathrin**

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*Use the relatively anatomically correct cell to the right to answer the following questions.*

- 84) Which letter indicates the Nucleus? **G (J also accepted)**  
85) Which letter indicates the Mitochondria? **I**  
86) Which letter indicates the Golgi Apparatus? **H**  
87) Which letter indicates the Cytosol? **Anything** (cytosol not labeled)  
88) Which letter indicates the Rough ER? **D** (E also accepted)  
89) Which letter indicates the Ribosomes? **C** (D also accepted)  
90) Which letter indicates the Plasma Membrane? **B**  
91) Which letter indicates the Nucleolus? **J (G also accepted)**

*Use the following list to answer the following questions.*

- |                                 |                    |
|---------------------------------|--------------------|
| a. Nucleus                      | g. Golgi Apparatus |
| b. Mitochondria                 | h. Cytoskeleton    |
| c. Ribosomes                    | i. Centrioles      |
| d. Chloroplasts                 | j. Cytoplasm       |
| e. Rough Endoplasmic Reticulum  | k. Cytosol         |
| f. Smooth endoplasmic reticulum |                    |

- 92) Which of the above includes everything between the cell membrane and the nucleus?  
**J (B-K also accepted)**
- 93) Which of the above organelles is the site of protein synthesis?  
**C (E also accepted)**
- 94) Which of the above organelles converts glucose into energy?  
**B**
- 95) Which of the above organelles organizes the cytoskeleton?  
**I**
- 96) Which of the above organelles sorts and ships substances within the cell?  
**G**
- 97) Which of the above organelles is sometimes attached to the Rough ER?  
**C**
- 98) Which of the above organelles supports and protects the cell?  
**H**
- 99) Which of the above is the gel-like, mostly water “broth” of the cell?  
**K**