



M610 TEST QUESTIONS

Basic Blood Chemistry

by Sharlene Peterson

1. The level of sugar (glucose) in the bloodstream is primarily controlled by the _____ (gluconeogenesis), adrenal glands (cortisol), and the pancreas (insulin).
 - A. Pituitary
 - B. Liver
 - C. Hypothalamus
2. Nutritional factors that influence cellular resistance include _____ chromium, zinc, magnesium, vitamin D, omega-3 fatty acids, adequate protein, and vitamin C.
 - A. Sucralose
 - B. Aspartate
 - C. B Vitamins
3. As a normal component of the vascular system, triglycerides are continually in circulation and ready to be metabolized to provide a source of _____.
 - A. Hormones
 - B. Minerals
 - C. Energy
4. Through activation of various signaling pathways, _____ regulate not only their own synthesis and enterohepatic circulation, but also triglyceride, cholesterol, glucose, and energy homeostasis.
 - A. Bile Acids
 - B. Lymphocytes
 - C. Nerves
5. Oxidation of cholesterol is damaging to all cells but particularly our heart and blood vessels. Unoxidized cholesterol is a free radical scavenger that _____ our cell membranes.
 - A. Protects
 - B. Dissolves
 - C. Hardens

6. Ammonia generated by _____ metabolism is converted to urea.
- A. Sugar
 - B. Protein
 - C. Fat
7. The degradation of creatine is of particular clinical interest. The only end product of creatine degradation is _____ which diffuses into the bloodstream from the muscle.
- A. Creatinine
 - B. Ammonia
 - C. Lactic Acid
8. Uric acid is commonly deposited in the ankle, hand, knees, tendons, and kidneys. Sub-acute gout is often mistaken for _____ or fibromyalgia.
- A. Dehydration
 - B. Carpal Tunnel
 - C. Arthritis
9. In acidemia (acidosis), calcium becomes ionized and _____ from serum proteins. In alkalemia (alkalosis), more calcium is bound to proteins.
- A. Liberated
 - B. Bonded
 - C. Protected

An increase in pH, alkalosis, promotes increased protein binding, which decreases free calcium levels. Acidosis, on the other hand, decreases protein binding, resulting in increased free calcium levels.

10. Chloride has an inverse relationship with carbon dioxide (CO₂). Metabolic acidosis is likely when CO₂ is decreased while chloride is _____.
- A. Alkalinized
 - B. Metabolized
 - C. Increased
11. On a blood test, adrenal hypo-function is indicated by the following: potassium levels greater than 4.5, sodium less than 136 and chloride values 101 or less. Because there is excess potassium and decreased sodium, this is a major marker for metabolic _____. It is wrong to assume that only acidosis is pathological. Alkalosis is just as common as acidosis, if not more so.
- A. Alkalosis
 - B. Acidosis
 - C. Amino Acids

12. Assessing magnesium status is difficult because most magnesium is _____ cells or in bone.
- A. Surrounding the
 - B. Inside
 - C. Attached to
13. Magnesium in the form of aspartate, citrate, lactate, and chloride are better _____ and more bioavailable than magnesium oxide and magnesium sulfate.
- A. Absorbed
 - B. Excreted
 - C. Regulated
14. Phosphorus is primarily stored in the _____ (85%) and is essential for bone matrix and hydroxyapatite metabolism.
- A. Brain
 - B. Bones
 - C. Fat Cells
15. Phosphorus and calcium have an inverse relationship when taking _____. When calcium levels increase the phosphorus levels will decrease. When phosphorus is ingested from whole foods it is “naturally buffered” with minerals and vitamins that act as synergistic co-factors to increase calcium metabolism.
- A. Magnesium
 - B. Prescription Medicines
 - C. Supplements
16. Like calcium, phosphorus levels are regulated by the _____ hormone (PTH). If the blood levels are high it usually indicates kidney issues or dehydration.
- A. Parathyroid
 - B. Hypothalamus
 - C. Thyroid
17. Potassium is vital for the proper functioning of nerves and _____. The heart muscle is sensitive to both high and low levels of potassium.
- A. Eyes
 - B. Lymphatics
 - C. Muscles

18. (True or False?) Potassium: If blood levels are high it usually indicates kidney issues or dehydration. Acute infections, tissue destruction, and asthma will also lead to a release of potassium into the blood.
- A. True
 - B. False
19. The role of _____ hormones should not be overlooked with high sodium levels. Aldosterone is the main mineralocorticoid secreted by the adrenal cortex, and it stimulates sodium absorption and potassium excretion.
- A. Pancreatic
 - B. Adrenal
 - C. Pituitary
20. The _____, as a reaction to metabolic acidosis, will eliminate CO₂ and preserve bicarbonate. With alkalosis, the lungs will decrease the loss of CO₂ while the kidneys excrete bicarbonate.
- A. Lungs
 - B. Skin
 - C. Kidneys
21. (True or False?) Fibrinogen is the most plentiful protein circulating in the blood and it is produced primarily in the liver.
- A. True
 - B. False
22. In humans, _____ is the most abundant plasma protein, accounting for 55–60% of the measured serum protein. It is used by the body for growth and tissue repair. Low albumin concentrations in the elderly increases the risk of functional decline.
- A. Amyloid
 - B. Android
 - C. Albumin
23. (True or False?) Total serum globulin includes alpha 1, alpha 2, beta and gamma fractions. Globulins are proteins that include gamma globulins (antibodies) and a variety of enzymes and transport proteins (they also transport vitamins, hormones, amino acids, waste products, calcium, and more). Gamma globulins, antibodies, are the most abundant.
- A. True
 - B. False

24. Alanine aminotransferase (ALT) is an enzyme found mainly in the _____ but also in smaller amounts in the kidneys, heart, muscles, and pancreas.
- A. Lungs
 - B. Liver
 - C. Stomach
25. Vitamin _____, in its active form of pyridoxal-5-phosphate, is required for the activity of the transferase enzymes.
- A. B1
 - B. B6
 - C. B12
26. (True or False?) The AST/SGOT enzyme is found in low metabolic tissues like muscles, kidneys, lungs, and the heart. In the event of cell regeneration the enzyme may be released into the blood.
- A. True
 - B. False
27. AST/SGOT is more specific for the detection of problems of _____ origin than for biliary tree or liver problems.
- A. Musculoskeletal
 - B. Neurological
 - C. Cardiovascular
28. Use of many other prescription and non-prescription drugs, including nonsteroidal anti-inflammatory drugs (NSAIDs), lipid-lowering drugs, antibiotics, histamine receptor blockers, antifungal agents, antidepressants, and hormones such as testosterone, can _____ GGT levels.
- A. Increase
 - B. Decrease
 - C. Regulate
29. (True or False?) Levels of GGT increase with age in women, but not in men, and are always somewhat higher in men than in women.
- A. True
 - B. False

Serum GGT enzyme values are similar for men and women, although some investigators have found that men may have slightly higher values. Elevated gamma glutamyl transpeptidase (GGT) may be depressed by female sex hormones. It is usually normal during pregnancy. - *Principles of Gender-Specific Medicine*, 2004

30. ALP is an enzyme produced by a variety of cells in response to rapid cellular proliferation and repair. Besides the obvious phosphorus need, _____ and B6 are also required for the formation of ALP.
- A. Selenium
 - B. Copper
 - C. Zinc
31. Bilirubin is formed from the breakdown of hemoglobin from red blood cells. Breakdown occurs in the spleen and bone marrow, and the bilirubin is transported to the liver where it is made water soluble and excreted in the _____.
- A. Urine
 - B. Bile
 - C. Sweat
32. (True or False?) Symptoms associated with biliary stasis/cholestasis, a condition where bile cannot flow from the liver to the duodenum, include: pain between shoulder blades, stomach upset by greasy foods, greasy or shiny stools, nausea, light colored stools, and gallbladder attacks.
- A. True
 - B. False
33. (True or False?) Hemoglobin is a protein present mainly in red blood cells. Hematocrit is a measurement related to total blood count. Both of these are used to diagnose anemia and are never mistaken to be the same thing.
- A. True
 - B. False
34. Ferritin is a protein found inside cells that _____ iron so your body can use it later. Ferritin is found in the cells of the liver, spleen, skeletal muscles, and bone marrow.
- A. Energizes
 - B. Stores
 - C. Repels
35. The body requires iron to make hemoglobin for blood and myoglobin for muscles. About _____ of the iron is stored in the ferritin protein but, this percentage can be significantly higher or lower in cases of iron overload or deficiency.
- A. 15%
 - B. 30%
 - C. 50%

36. Most of the body's iron (about 60%) is found in hemoglobin. Hemoglobin is the protein molecule in _____ cells that carries oxygen from the lungs to the body's tissues and returns carbon dioxide from the tissues back to the lungs.
- A. Endothelial
 - B. Platelet Cells
 - C. Red Blood
37. RBC (red blood cells) are produced in the _____ and then released into the bloodstream as they mature. RBCs have a lifespan of about 120 days and are continuously renewed and replaced as they age and degrade or are lost through bleeding.
- A. Liver
 - B. Adrenal Glands
 - C. Bone Marrow
38. (True or False?) The RBC count may be used to detect a problem with red blood cell production and/or lifespan but it cannot determine the underlying cause.
- A. True
 - B. False
39. RDW describes the size of the red blood cells. Newly-made red blood cells are called reticulocytes. Reticulocytes, B12 deficient cells, and folic acid-deficient cells are _____ than iron-deficient red blood cells.
- A. Smaller
 - B. Larger
 - C. Rounder
40. Platelets play a critical role in the control of bleeding and _____ of blood vessel walls.
- A. Growth
 - B. Repair
 - C. Cleaning
41. White blood cells are called _____.
- A. RBCs
 - B. Platelets
 - C. Leukocytes
42. The physiologic role of basophils remains unknown, although they are thought to play a role in host defense, particularly against _____.
- A. Parasites
 - B. Viruses
 - C. Bacteria

43. (True or False?) Basophils activated by IgE and antigen can help to induce the development of acute allergic reactions, such as anaphylaxis to bee stings or peanut products, and also chronic allergic reactions, such as in asthma or atopic dermatitis.
- A. True
 - B. False
44. Lymphocytes are the cells that determine the _____ of the immune response to infectious microorganisms and other foreign substances. They are found in the blood, spleen, tonsils, and lymph nodes.
- A. Ambiguity
 - B. Obscurity
 - C. Specificity
45. It is the long-lived T and B cells that provide immunologic “_____” to provide a fast response to a second encounter with the same antigen/infectious agent/foreign substance.
- A. Protection
 - B. Memory
 - C. Strength
46. Natural killer (NK) cells are a frontline defense system. They do not attack invading organisms _____, they destroy the body’s own cells that have either become cancerous or are infected with a virus.
- A. Indirectly
 - B. Quickly
 - C. Directly
47. This type of white blood cell is important for fighting infections. They release a lysozyme able to dissolve bacterial walls. For serious infections they require the support of monocytes, macrophages, antibodies, etc. This white blood cell is called a _____.
- A. Eosinophil
 - B. Basophil
 - C. Neutrophil