

UNIT 1 STUDY QUESTIONS

1. Discuss the water compartments of intracellular and extracellular fluids (plasma and interstitial). Include percentages.
2. Define homeostasis, negative feedback, and the components of the negative feedback reflex.
3. Discuss heat gain through metabolic and muscular heat production, radiation, and conduction; and heat loss through evaporation, radiation, and conduction in the body.
4. Discuss the physiological thermoregulatory reflexes involved when the body is becomes too hot and too cold.
5. Describe behavioral responses when the body is too hot and cold.
6. Define the three types of chemical bonds (covalent, ionic, and hydrogen) and define polar and non-polar molecules. Include examples.
7. Discuss the properties of water.
8. Discuss buffers using phosphates and carbonates as examples.
9. Define condensation and hydrolysis of the biomolecules.
10. Discuss the functions of glucose, glycogen, triglycerides, phospholipids, and proteins.
11. Describe the primary structure of a protein how it can be modified by amino acid substitution caused by genetic point mutations.
12. Discuss the various agents that can denature proteins and how they alter the protein's structure.
13. Discuss the four characteristics of a protein's binding site. Discuss a different biological example for each characteristic.
14. Define potential and kinetic energy. Include how temperature affects kinetic energy.
15. Discuss exergonic and endergonic reactions and describe the process of coupled reactions involving ATP.
16. Discuss the general purpose of cellular respiration and state the overall chemical reaction of aerobic respiration.
17. List the specific cell locations, substrates, and products of glycolysis, citric acid (Krebs) cycle, and oxidative phosphorylation.
18. Describe how carbon monoxide and cyanide can inhibit aerobic respiration.
19. Discuss anaerobic metabolism (glucose to lactate) and discuss fermentation in yeast.
20. Discuss glycogen, fat, and protein metabolism in relationship to aerobic respiration.
21. Discuss the chemical conversions between the fats, proteins, and carbohydrates.
22. Describe the fluid mosaic structure of the cell membranes. Include channel proteins and carrier proteins.
23. Discuss the chemical and electrical driving forces across a membrane.
24. Discuss diffusion and the factors affecting its rate.
25. Compare and contrast facilitated diffusion and active transport and the factors that influence their rate of transport.
26. Discuss cystic fibrosis.

27. Define osmosis, osmotic pressure, solvent, solute, solution, molarity, osmolarity, iso-osmotic, hyperosmotic, hypo-osmotic, isotonic, hypertonic, and hypotonic.
28. Discuss the osmotic and tonic differences in the various clinical intravenous solutions and how they can be used to expand blood volume and help with tissue dehydration.
29. Discuss exocytosis. Give examples.
30. Discuss intercellular communication and describe the functional and chemical classifications of chemical messengers.
31. Discuss the properties of the receptor and the factors that influence the strength of cell's response.
32. Discuss the different types of histamine receptors and the drugs that work at the receptors.
33. Discuss the intracellular receptor responses; the membrane bound G-protein receptor responses; and cyclic AMP. Discuss how the toxins in cholera and pertussis affect the G-protein process.
34. Discuss the biorhythm role of melatonin from the pineal gland and relate to jet lag.
35. Discuss the neural relationship between the hypothalamus and the posterior pituitary and list the two hormones secreted from the posterior pituitary and state their actions.
36. List the hormones secreted from the anterior pituitary and explain their actions in the body. Include tropins.
37. Discuss the vascular relationship between the hypothalamus and the anterior pituitary and the secretion of releasing and inhibiting hormones from the hypothalamus.
38. Discuss the negative feedback loops of the target gland hormones to the hypothalamus and anterior pituitary.
39. Describe the functions of thyroxine and triiodothyronine and their production and negative feedback loops.
40. Discuss goiter, hyperthyroidism and hypothyroidism. Give examples.
41. List the hormones secreted from the adrenal medulla and state their functions.
42. List the three categories of hormones secreted from the adrenal cortex and list their actions in the body.
43. Discuss acute and chronic stress and the hormones involved with stress.
44. List the cell types in the pancreatic islets and the hormones they secrete.
45. Describe the role of insulin in the regulation of glucose during the absorptive state. Include secretion of the hormones and their actions on their specific targets.
46. Discuss diabetes mellitus.
47. Describe the role of glucagon in the regulation of glucose during the post-absorptive state. Include secretion of the hormones and their actions on their specific targets.
48. Discuss the interaction between growth hormone and somatomedin, their targets, and their functions in the body.
49. Discuss how calcitonin regulates calcium homeostasis.
50. Discuss how parathyroid hormone and calcitriol regulates calcium homeostasis.