

Unit 1 Lecture Objectives

Upon completion of this unit, the student should be able to achieve the following performance objectives:

1. Define homeostasis, and by giving examples, explain its role in maintaining normal body function.
2. Explain negative and positive feedback systems and give examples of each.
3. Identify and explain function the components of a feedback loop: receptor, integrator, effector.
4. Describe the structural organization of the human body.
5. Explain the structure of the atom, including the subatomic particles.
6. Define isotope, ion, anion, cation and electrolytes.
7. Differentiate among elements, molecules and compounds.
8. Differentiate among ionic, polar covalent, nonpolar covalent and hydrogen bonds.
9. Describe the classes of macromolecules: carbohydrates, lipids, nucleic acids, and proteins.
10. Explain the properties of water.
11. Explain metabolism and relate it to examples of the following chemical reactions: anabolism, catabolism, dehydration, synthesis, and hydrolysis.
12. Describe and give the function of the following organelles plasma membrane, nucleus (chromatin, chromosome), nucleolus, mitochondria, endoplasmic reticulum, ribosome, Golgi body (apparatus), lysosome, peroxisome, filament, microtubule, centriole, flagellum, cilia and microvilli.
13. Describe the ways in which substances normally enter and leave cells using the following terms: active and passive transport, diffusion, facilitated diffusion (transport), selectively permeable, osmosis, hypertonic, isotonic, hypotonic, equilibrium, filtration, exocytosis, endocytosis, phagocytosis, pinocytosis, receptor-mediated endocytosis, sodium/potassium pump, hydrogen ion (H^+) pump, and calcium (Ca^{2+}) pump.
14. Describe mitosis and meiosis. State the function of each process.
15. Describe protein synthesis as it relates to genes, amino acid sequences, and 3-dimensional structure.
16. Identify the organic molecule which is the most immediate source of energy for chemical reactions.
17. Describe the events and significance of cellular respiration, separately describing glycolysis, the transition (prep) reaction, the Krebs' (citric acid) cycle and the electron transport system (ETS).
18. Explain the production of lactic acid and oxygen debt.
19. List the four major categories of tissues and discuss the generalized functions of each type.
20. Classify epithelial tissue types using both cell shape and number of cell layers; relate them to epithelial functions in the body.

21. Discuss glandular epithelium and compare endocrine and exocrine glands in terms of structure, method of secretion, and location in the body.
22. Describe the following membranes and give examples of each: mucous, serous, and cutaneous.
23. Compare bone and cartilage in terms of generalized function, cell types, organizational structure, and blood supply.
24. Identify the three specialized types of cartilage and give examples of each.
25. Compare and contrast three types of muscle tissue and describe body regions or structures, where each type may be found.
26. Describe nervous tissue with regards to structure and function.
27. Discuss the generalized functions of the skin as an organ.
28. Describe the cell types and cell layers of the epidermis.
29. Describe the layers, structural components, and functions of the dermis.
30. Compare the structure and function of sudoriferous (sweat), sebaceous (oil), and ceruminous (wax) glands.
31. List the functions of the skeletal system.
32. Identify the major structures of a typical long bone.
33. Describe the microscopic structure of bone using the following: lamellae, lacunae, canaliculi, osteocyte, perforating canal, central canal, and osteon.
34. Compare compact bone with spongy cancellous bone as to location, and histology.
35. Compare and contrast the development of intramembranous and endochondral bone formation.
36. Describe the stages in fracture healing and general bone maintenance, using the following terms: osteoblast, osteocyte, osteoclast, calcium, calcification, resorption, phosphorus, callus, osteoporosis, and vitamins A, C, and D.
37. Define articulation (joint), ligament, and tendon.
38. Discuss the structures of a synovial joint including joint cavity, articular cartilage, synovial fluid, synovial membrane, and joint capsule.
39. Describe the structural components of skeletal muscle tissue from the molecular to the organ level.
40. Describe the structure, function, and importance of sarcomeres.
41. Identify the energy sources required for muscle contraction.
42. List, in the correct order, the steps in muscle contraction beginning with nervous stimulation of the muscle cell surface.
43. Compare and contrast the following types of muscle contractions: isotonic, isometric, and tetanic.
44. List the names and functions of major chemical compounds found in muscle tissue.
45. Explain the roles of agonists, antagonists, synergists, and fixation muscles in body movement.