

Study Guide for Final Exam – Biol-1, C. Briggs, rev. FA17

Test preparation suggestions: Same as before. Keep at it! Be able to:

Homeostasis (Ch. 26)

1. Describe how homeostasis is maintained through negative feedback, with words and a diagram.
2. Explain how oxygen levels are regulated in the blood. (Use the terms: erythropoietin (EPO), kidneys, bone marrow, red blood cells, and hemoglobin.)

Nervous System (Ch. 27)

3. Describe what your sleeping brain is doing for you. (See website for video link.)

Endocrine System (Ch. 28)

4. Describe how hormones work in general.
5. Compare how both (1) steroid hormones and (2) amino-acid-based hormones / peptide hormones influence a target cell.
6. Describe how insulin and glucagon work together to regulate blood-sugar levels.
7. Describe the roles of cortisol in the body.

Immune System (Ch. 29)

8. Describe what Edward Jenner did to demonstrate immunization.
9. Explain how these defend our body against pathogens: salty, densely-packed skin cells; mucous; and acids.
10. Describe common symptoms of inflammation.
11. Connect the symptoms of inflammation to their causes.
12. Explain how pus forms.
13. Describe what antibodies are, and how they are made.
14. Explain how cell-mediated immunity uses proteins on body cells to recognize cells that are infected with viruses.
15. Explain what dendritic cells do.
16. Describe how protective immunity develops.
17. Describe how a vaccine works.

Circulation & Respiration (Ch. 30)

18. Describe the composition of blood.
19. Compare LDL and HDL, and explain why people might want different amounts in their blood.
20. Diagram how arteries, capillaries, and veins are connected.
21. Explain what the sinoatrial node is for.
22. Explain the function of heart valves.
23. Explain how coronary arteries are related to heart attacks.
24. Describe how coronary bypass surgery works.
25. Describe what happens in capillary beds.
26. Describe lung structure and how it is related to efficient gas exchange.

Urinary System / Homeostasis (Ch. 31)

27. Diagram the major parts of the urinary system (bladder, ureters, aorta, vena cava, kidneys, urethra).
28. Give a general idea of how the kidneys filter the blood.
29. Trace wastes from the blood to the kidneys to excretion.
30. Describe how the antidiuretic hormone (ADH) regulates the amount of water in the blood.

Digestive System (Ch. 31)

31. Label a diagram with the relative positions of the esophagus, stomach, small intestine, large intestine, anus, liver, pancreas, appendix, salivary glands, and gallbladder.
32. Find applications of the theme of “structure / function” in the digestive system.
33. Identify the locations of major shifts in pH during digestion.
34. Intelligently evaluate nutritional claims, using your tools for reasonable skepticism.
35. Describe what high-fructose corn syrup (HFCS) is, and how it is generally produced.

Reproductive System (Ch. 33)

36. Label a diagram of female and male genitalia. (Use the terms: clitoris (head, glans), urethral opening, labium majora/minora, vaginal opening, perineum, anus, penis (head, shaft), and scrotum.)
37. Explain how female and male external genitalia arise from homologous structures, using a diagram that you draw.
 - start with the genital tubercle, urethral fold, and labioscrotal swelling.
 - develop these structures to the developed female and male forms (just like in our figures from lecture).
38. Describe common variations in genital appearances.
39. Recognize the connection between hormones and the menstrual cycle.
40. Describe how the circuitous route of the ductus deferens develops.
41. Interpret and recognize themes in the table describing contraceptives.

Population Ecology (Ch. 34)

42. Describe what is meant by growth rate (r) and carrying capacity (K).
43. Distinguish among arithmetic, exponential, and logistic growth. *It will help to draw graphs of population size over time.*
44. Describe various qualities of a life history (life span, age of reproduction, growth rate, # of offspring, size, amount of care of offspring).
45. Distinguish between qualities of equilibrium species vs. opportunist species.
46. Draw and interpret survivorship curves.
 - Can you match these curves to opportunists and to equilibrium species?
 - Can you match these curves to exponential and logistic growth?
47. Identify which survivorship curve best matches an organism, based on its life history characteristics.
48. Explain why logistic growth is more realistic than exponential growth.
49. Show how resource managers use carrying capacity and logistic growth models to decide how much to harvest.

Communities and Ecosystems (Ch. 35)

50. Distinguish between dominant and keystone species.
51. Describe various diversity types (species, geographic, genetic).
52. Distinguish among producers, consumers (primary, secondary, etc.), and decomposers.
53. Distinguish between competitive exclusion and resource partitioning.
54. Name some ways that animals avoid predation, and plants avoid herbivory.
55. Predict what would happen if a particular organism was removed from a food web.
56. Predict what would happen if a keystone species was killed off.
57. Label these symbioses as +/+, +/-, -/-, or +/-0: commensalism, parasitism, mutualism, competition
58. Give an example of a mutualism between two species.
59. Explain why we sometimes find population cycles in predator-prey interactions.

Human Impacts (Ch. 36)

60. Give some examples of biotic and abiotic factors.
61. Explain why there must be continual energy input into an ecosystem, while elements can be reused in a cycle.
62. Describe how extra nutrients like nitrogen and phosphorous affect aquatic systems (think dead zone).
63. Use a diagram to explain how the water cycle links biomes together.
64. Explain why there are usually no more than 3-5 trophic levels in a food chain.
65. Explain why vegetarianism is more energy-efficient than eating meat.
66. Explain how carbon dioxide from fossil fuels is different from carbon dioxide from burning wood.