

Name: _____

Date: _____

Biology EOC Review Questions

1. List 4 characteristics unique to living things:

1.
2.
3.
4.

2. Explain the difference between biotic and abiotic factors.

3. What is homeostasis?

4. How do cells maintain homeostasis, pH, temperature and salinity?

5. Explain the following

a. ionic bonds –

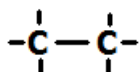
b. covalent bonds –

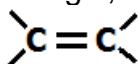
c. hydrogen bonds –

6. Number the following bonds in order of strength from strongest to weakest:

_____ ionic bonds _____ covalent bonds _____ hydrogen bonds

7. Which of these represents a single, double, and triple bond?







8. How many bonds can each of the following make?

_____ Carbon (C) _____ Nitrogen (N) _____ Oxygen (O) _____ Hydrogen (H)

9. Which of the following stores energy? (Circle Your Answer)

Making Bonds Breaking Bonds

10. Which of the following releases energy? (Circle Your Answer)

Making Bonds Breaking Bonds

11. What is an organic compound?

12. Complete the table regarding the four types of organic molecules:

Organic Molecule:	Atoms Present:	Building Blocks (Monomers)	What do they do?
Carbohydrates Example?			
Lipids Example?			
Proteins Example?			
Nucleic Acids Example?			

13. Match the test with the organic molecule (draw a line):

Organic Molecule	Test
Lipids (Fats/Oils)	Iodine Test (brown → dark blue)
Carbohydrates (Starches)	Brown Paper Bag Test (translucent spot) OR Sudan Test (red → orange)
Proteins	Benedict's Test (blue → green, yellow, or red)
Carbohydrates (Simple Sugars)	Biuret Test (blue → purple)

14. List the *function* and *describe the structure* of the following organelles:

- a. nucleus
- b. plasma membrane
- c. cell wall
- d. mitochondria
- e. vacuoles
- f. chloroplast
- g. ribosomes

15. Explain how a compound light microscope works.

16. Draw the way a lowercase letter “e” would look under a microscope:

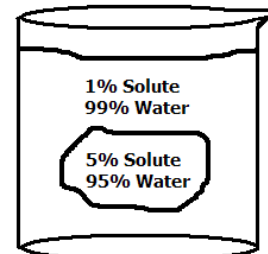
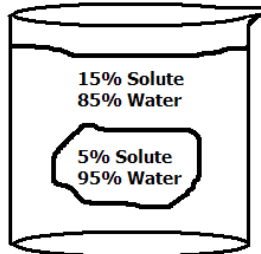
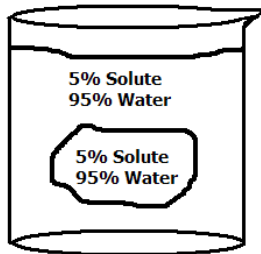
17. Explain the differences in size, chromosome structure, and organelles between prokaryotes and eukaryotes.

18. Explain why water is important to cells.

19. Define:

- a. active transport
- b. passive transport
- c. diffusion
- d. osmosis
- e. selectively permeable membranes

20. Draw arrows to show which way water will move in each of the following situations, and tell what will happen to each cell:



21. Define enzymes –


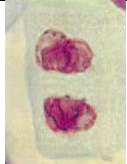
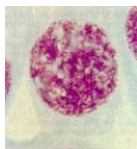
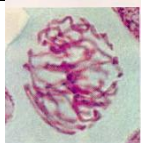

22. How do temperature and pH affect enzymes?

23. Explain the lock-and-key model of enzymes and substrates.

24. Define:

- a. aerobic –
- b. anaerobic –

25. What is alcoholic fermentation? What are the products?
26. Write the equation for aerobic Cellular Respiration:
27. What are the reactants and what are the products for cell respiration?
28. What is chemosynthesis?
29. Write the equation for Photosynthesis:
30. What are the reactants and what are the products for photosynthesis?
31. Describe the structure of the DNA molecule.
32. Name the nitrogen bases found in DNA and what they bond to.
33. What type of bond forms between the nitrogen bases in DNA?
34. Describe the process of DNA replication.
35. List three differences between DNA and RNA:
 - 1.
 - 2.
 - 3.
36. Describe the process of transcription and where it happens.
37. Describe the process of translation and where it happens.
38. What is a codon?
39. Compare and contrast Mitosis and Meiosis:
40. Put the pictures of cells in interphase and the stages of mitosis in order, and name each phase.

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41. Define:
- diploid -
 - haploid -
42. a. What is crossing over?
 b. When does crossing over occur?
 c. What's the benefit of crossing over?
43. What is the Law of Independent Assortment? How does it increase variation?
44. What is a mutation? How does it increase variation?
45. How can reproductive variations benefit a species?
46. Define:
- dominant -
 - recessive -
 - homozygous -
 - heterozygous –
 - genotype –
 - phenotype –

47. Sample Monohybrid Cross Question:

In a genetics laboratory, two heterozygous tall plants are crossed. If tall is dominant over short, what are the expected phenotypic results?

48. Sample Dihybrid Cross Question:

The table below shows a cross between two pea plants both heterozygous for round seeds (Rr) and yellow seeds (Yy). What phenotype ratio would you expect in the offspring?

	RY	Ry	rY	ry
RY				
Ry				
rY				
ry				

49. Sample Blood Type (Multiple Allele) Question:

Mr. Jones has blood type A and Mrs. Jones has blood type AB. What is the probability that they will have a child with blood type A if both of Mr. Jones's parents were AB?

50. Sample Sex-linked trait Question:

Color blindness is a sex-linked recessive trait. A mother with normal color vision and a color blind father have a color blind daughter. Which of the following statements is correct?

- A) All of their daughters will be color blind.
- B) The mother is a carrier of the color blindness gene.
- C) All of their sons will have normal color vision.
- D) All of their sons will be color blind.

51. What is a pedigree? How is it useful in genetics?

52. What is a polygenic trait?

53. Describe Gregor Mendel's pea plant experiments:

54. How can DNA technology allow us to:

- a. Identify an individual?
- b. Identify a person's parents?
- c. Investigate a crime scene?

55. What is amniocentesis?

56. What is gene therapy?

57. How can genetic technology allow us to create human insulin using bacteria?

58. What is a transgenic organism and give an example?

59. What is cloning?

60. What is gel electrophoresis?

61. Be able to interpret a gel electrophoresis diagram.

62. What are some ethical implications and dangers of biotechnology?
63. Explain the interacting role of genetics and environment on human health.
64. Describe the following genetic diseases:
 - a. sickle-cell anemia -
 - b. colorblindness -
 - c. cystic fibrosis -
 - d. hemophilia -
 - e. Down Syndrome (trisomy 21) -
 - f. Huntington's Disease -
65. Describe how genetics and environment affect:
 - a. cardiovascular disease -
 - b. diabetes -
 - c. cancer -
 - d. asthma -
66. Describe what causes:
 - a. malnutrition -
 - b. lead poisoning -
67. What are the impacts of:
 - a. tobacco use –
 - b. radiation –
68. Contrast abiogenesis and biogenesis.
69. What did Louis Pasteur contribute to our understanding of the origins of life?
70. Explain Miller and Urey's hypothesis and lab simulation.
71. What can we infer from the fossil record? Where do you find the oldest/youngest fossils?
72. Define and give an example:
 - a. adaptive radiation -
 - b. vestigial structures -
 - c. biochemical similarities between species -
73. Define natural selection.
74. How are variation and natural selection related?
75. What is geographic isolation?
76. What is reproductive isolation?

77. Describe Charles Darwin's theory of natural selection:

78. Define the following and explain how they are related to natural selection:

a. pesticide resistance –

b. antibiotic resistance –

79. How does our modern classification system show the evolutionary relationship among organisms?

80. How has a knowledge of evolutionary relationships affected our understanding of:

a. DNA analysis-

b. Biochemical analysis-

c. Embryological development-

81. Explain the characteristics of these organisms including their reproduction, how they eat, & how they regulate their internal environment:

KINGDOM	Group	Reproduction	How They Get Food	Regulation of Internal Environment
ANIMALS	Porifera			
	Cnidaria			
	Annelida			
	Mollusca			
	Arthropoda			
	Chordata			
PLANTS	Mosses			
	Ferns			
	Angiosperms			
	Gymnosperms			
FUNGI				
PROTISTS				
MONERA				

82. Are viruses living or nonliving? Explain.

83. Be able to use a simple dichotomous key.

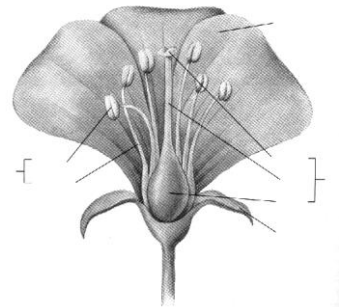
84. Describe the function of the following systems:
- Body covering (skin)
 - Cardiovascular
 - Digestive
 - Endocrine
 - Excretory
 - Immune
 - Nervous
 - Muscular
 - Reproductive
 - Respiratory
 - Support (skeletal)

85. How do hormones work and what is a feedback system?

86. Explain how neurons pass information to muscles and other neurons.

87. Describe the function of the following parts of the flower, & label them in the picture to the left:

- petals
- pistil
- stamen/anthers
- ovary



88. What adaptations are necessary for:

- life on land:
- aquatic life:

89. What abiotic factors determine what biome will be present in a region?

90. How do the biotic factors and the abiotic factors in an ecosystem affect each other?

91. What is a niche?

92. Define these types of relationships (symbiosis).

- mutualism –
- commensalism-
- parasitism-

What is a predator/prey relationship?

93. Define and give an example of:
 - a. density-dependent limiting factor –
 - b. density-independent limiting factor –
94. What is carrying capacity?
95. Describe the following cycles:
 - a. water cycle-
 - b. carbon cycle-
 - c. nitrogen cycle-
96. Study the materials cycle diagrams in your book.
97. How can humans influence cycling with:
 - a. deforestation-
 - b. fertilizers-
 - c. factories-
98. What is nitrogen fixation and what organisms are involved?
99. How does photosynthesis relate to energy getting into ecosystems?
100. What role do decomposers play in the environment?
101. What is a trophic level?
102. What is a food chain? Draw a food chain including the following organisms: *heron*, *minnow*, *plankton*.
103. Study the trophic pyramids in your book.
104. What happens to energy in an ecosystem? What happens to nutrients?
105. How much energy is passed from one trophic level to the next in an ecosystem? What happens to the rest?

106. What is a food web?
107. What is primary succession?
108. What is secondary succession?
109. What is a climax community?
110. What is global warming? What causes it?
111. What are the possible effects of global warming?
112. What are some ways that carbon dioxide emissions can be reduced?
113. What are some factors that influence birth/death rates in the human population?
114. What effects would the following have on the environment?
 - a. human population size-
 - b. human population density-
 - c. resource use-
115. What effect can a buildup of pesticides have over the long term in the environment (bioaccumulation/biological magnification)?
116. What affect can pesticides have on organisms that they weren't intended to affect?
117. What is pesticide resistance? What are the long term affects?
118. What are some biological alternatives to chemical pesticides? What are the pros and cons?
119. What is DDT and what are its effects on the ecosystem?
120. Explain how the following adaptations affect an organism's ability to survive:
 - a. Mimicry –
 - b. Protective coloration-
 - c. Parental behavior-
 - d. Feeding strategies-
121. Give an example of how an organism might change their behavior to respond to their environment.

122. Define the following tropisms:

- a. phototropism –
- b. geotropism/gravitropism –
- c. thigmotropism –

123. Define:

- a. chemotaxis (positive/negative)-
- b. phototaxis (positive/negative)-
- c. reflexes-
- d. imprinting-
- e. instincts-
- f. types of learned behavior-

124. Define:

- a. Circadian rhythms –
- b. Migration –
- c. Estivation –
- d. Hibernation –
- e. Biological Clocks –

125. Explain how certain animal behaviors such as courtship and other behaviors may have evolved.