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Biology EOC Review Guide – Garner Magnet HS 2014-15

**UNIT 1 : INTRO / BIOCHEM**

1. List all the characteristics of living things.

2. Define homeostasis.

3. Place in order from smallest to largest : compound, atom, cell, organism, organelle, tissue

4. Describe each of the following bonds:

a. ionic bond

b. covalent bond

c. hydrogen bond

5. Describe each property of water:

a. polar

b. high specific heat

c. adhesive

d. cohesive

e. universal solvent

6. Differentiate an acid from a base.

7. What purpose do buffers serve?

8. What do organic compounds contain that inorganic compounds do not?

9. Give an example of a monomer and a polymer.

10. Describe what happens in each of the following:

a. condensation reaction

b. hydrolysis

\*\*\* 1) What is Ms. Sivamani’s favorite color?

11. List the 4 types of organic compounds.

12. Fill in the following chart:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Carbohydrates | Lipids | Proteins | Nucleic Acids |
| Elements Present |  |  |  |  |
| Monomer unit |  |  |  |  |
| Examples (give 3) |  |  |  |  |
| Functions |  |  |  |  |
| Drawings |  |  |  |  |

13. How is a disaccharide created? What must be given off to do so?

14. What are starch and glycogen both made up of?

15. Define steroid.

16. How many molecules of water is needed for the hydrolysis of a lipid?

17. How many amino acids are there?

18. What bond holds amino acids together?

19. What do enzymes do?

20. Summarize how an enzyme works.

\*\*\*2) Which country is Nelson Mandela from?

21. List the three factors that affect enzyme functioning.

22. What does it mean when an enzyme is denatured?

23. In nucleic acids, what are the three parts of a nucleotide?

**UNIT 2 : CELLS**

24. What are the two main types of cells?

25. What is the only example of a prokaryotic cell?

26. What makes a prokaryotic cell different from a eukaryotic cell?

27. Where is DNA located in a prokaryotic cell?

28. Draw and label a bacteria.

29. Give examples of eukaryotic cells.

30. Where is DNA located in a eukaryotic cell?  
\*\*\* 3)What is the inscription in the Ring of Power in the Lord of the Rings trilogy?

31. Draw and label a typical animal cell.

32. Fill in the following chart:

|  |  |  |
| --- | --- | --- |
| Organelle | Function | Found in… (bacteria, plant, animal) |
| Plasma membrane |  |  |
| Cell wall |  |  |
| Nucleus |  |  |
| Cytoplasm |  |  |
| Ribosome |  |  |
| ER |  |  |
| Golgi |  |  |
| Mitochondria |  |  |
| Vacuole |  |  |
| Chloroplast |  |  |
| Centriole |  |  |

33. List three reasons why cells are small.

34. Which cells might need…

a. more mitochondria?

b. a flagella for movement?

c. a structure to allow for transportation of oxygen?

35. What is a stem cell?

36. How does a stem cell become differentiated?

37. List the two types of stem cells.

38. How do buffers maintain homeostasis?

39. What happens if you are too hot? Too cold?

40. How does your body maintain the levels of glucose in your blood?  
\*\*\* 4) Draw a happy bacterial cell.

41. Where does water balance take place?

42. What are the functions of the plasma membrane?

43. Describe the structure of the plasma membrane.

44. Draw and label the plasma membrane.

45. List two functions of proteins found in the membrane.

46. How do cells recognize each other?

47. What is all cellular transport based on?

48. Fill in the following chart:

|  |  |  |
| --- | --- | --- |
|  | Passive Transport | Active Transport |
| Which direction do particles move? |  |  |
| Is energy required? |  |  |
| Is equilibrium reached? |  |  |
| Example: |  |  |

49. Compare and contrast diffusion and osmosis.

50.Fill in the following chart:

|  |  |  |  |
| --- | --- | --- | --- |
|  | HypOtonic | Hypertonic | Isotonic |
| Where is there a higher conc. of solutes? |  |  |  |
| Where is there a higher conc. of water? |  |  |  |
| Which direction will the water move? |  |  |  |
| What will happen to the cell? |  |  |  |
| Example: |  |  |  |

\*\*\* 5)What is the meaning of life?

51. Fill in the following chart:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Photosynthesis | Aerobic Cell Respiration | Anaerobic Cell Respiration |
| Write equation: |  |  |  |
| What is needed for this reaction to occur? |  |  |  |
| What is the goal of this process? |  |  |  |
| What is/are the waste products? |  |  |  |
| Who undergoes this reaction? |  |  |  |
| Organelle where this reaction takes place? |  |  |  |

52. List three factors that affect the rate of photosynthesis.

53. Which process produced the most amount of energy?

54. What is ATP?

55. Where is ATP made?

56. What process produces ATP?

57. How is energy used from ATP?

58. How is energy stored in ATP?

59. List one process where ATP is required.

60. What is the cell cycle?

\*\*\* 6)What is your favorite ice cream flavor and why?

61. Describe what happens in each of the stages of the cell cycle:

a. G1

b. S

c. G2

d. Mitosis

e. Cytokinesis

62. Why is it important for DNA replication to occur prior to cell division?

63. Summarize the steps of DNA replication.

64. What is the final product of DNA replication?

65. What is the relationship between chromatin and chromosomes?

66. What is the relationship between a chromosome and a doubled chromosome?

67. What is the relationship between a doubled chromosome and a chromatid?

68. Summarize each phase of mitosis.

a. prophase

b. metaphase

c. anaphase

d. telophase

69. Why is cytokinesis important?

70. What is the purpose of mitosis in each of the following?

a. unicellular organisms:

b. multicellular organisms:

\*\*\* 7) What is your most recent Facebook status (make sure it is appropriate, please)?

71. What controls the cell cycle?

72. What causes the formation of tumors?

**UNIT 3 : GENETICS / BIOTECHNOLOGY / PROTEIN SYNTHESIS**

73. What does DNA code for?

74. DNA a polymer of what?

75. What are the three parts of a nucleotide?

76. What bases pair with each other in DNA?

77. What part of DNA determines which proteins will be made?

78. Draw a double helix DNA strand with the following bases on one side : ATTGC, labeling the following : bases, sugar,

phosphate, hydrogen bonds, and covalent bonds.

79. What is the goal of protein synthesis?

80. In which two organelles does protein synthesis occur?

\*\*\* 8) What is a unique name you would like to give to a future/current pet?

81. What are the two steps in protein synthesis?

82. Fill in the following chart:

|  |  |  |
| --- | --- | --- |
|  | DNA | RNA |
| Made up of a polymer of … |  |  |
| Sugar |  |  |
| # of strands |  |  |
| Base pairing |  |  |

83. Describe each type of RNA:

a. mRNA

b. tRNA

84. Where does transcription take place?

85. Summarize what happens during transcription.

86. What is the end result of transcription?

87. Where does translation take place?

88. Summarize what happens during translation.

89. What is the end result of translation?

90. What determines which protein is made?

\*\*\* 9) What is a song that you like to sing out loud?

91. Differentiate between an anticodon and a codon.

92. Define a mutation.

93. What causes a mutation? Give examples.

94. Describe each of the following DNA mutations:

a. deletion

b. insertion

c. substitution

95. What mutation causes sickle cell anemia?

96. What does gel electrophoresis do?

97. What is gel electrophoresis used for?

98. Summarize the steps of gel electrophoresis.

99. What does PCR do?

100. What is a clone?

\*\*\* 10) What is your favorite animal? List three adjectives to explain your choice.

101. What is a transgenic organism?

102. What is recombinant DNA?

103. What do restriction enzymes do to DNA?

104. Summarize the steps of creating a transgenic organism.

105. Give 2 applications of using a transgenic organism.

106. What was the goal of Human Genome Project?

107. Describe how gene therapy is used to treat the following diseases:

a. SCID

b. Cystic Fibrosis

108. How can embryonic stem cells be used to treat different disease?

109. What is the limitation is using adult stem cells vs. embryonic stem cells?

110. List one disease that can be treated with the use of stem cells.

\*\*\* 11) You were just given a yacht (an expensive boat). What would you name it?

111. What is a GMO?

112. Give 2 examples of a GMO.

113. Fill in the following chart:

|  |  |  |
| --- | --- | --- |
|  | Asexual Reproduction | Sexual Reproduction |
| How many parents are involved? |  |  |
| Do the offspring express variation? |  |  |
| Is the fusion of gametes involved? |  |  |
| Which form of cell division is associated with this process (mitosis or meiosis)? |  |  |

114. Define the following examples of asexual reproduction:

a. binary fission

b. regeneration

c. budding

115. Fill in the following chart:

|  |  |  |
| --- | --- | --- |
|  | Mitosis | Meiosis |
| Cells that undergo this process |  |  |
| Number of cell divisions |  |  |
| Number of cells produced |  |  |
| Type of cell produced (haploid/diploid) |  |  |
| Drawing |  |  |

116. Define the following terms:

a. gametes

b. somatic cells

c. zygote

d. haploid

e. diploid

f. chromosome

g. homologous chromosomes

117. Describe the following sources of genetic variation and give an example of a disease caused by each one

a. Crossing over

ex:

b. Nondisjunction

ex:

118. Describe each of the types of chromosomal mutations:

a. deletion

b. insertion

c. inversion

d. translocation

119. What does is mean that chromosomes undergo random assortment?

120. Define the following terms:

a. fertilization

b. gene

c. allele

d. dominant

e. recessive

f. homozygous

g. heterozygous

h. genotype

i. phenotype

\*\*\* 12) If you could spend 15 minutes with any living person, who would it be and why?

121. Summarize the following:

a. Mendel’s Law of Segregation

b. Mendel’s Law of Independent Assortment

122. Know how to do the following punnett squares:

a. In mice, black fur is dominant to white fur. Cross a white mouse with a heterozygote.

b. In chickens, black feathers are co-dominant to white feathers. Cross 2 checkered chickens.

c. In roses, red and white petals are incompletely dominant. Cross a red rose and a white rose.

d. A woman with type AB blood marries a man who is type A blood, but has a mother with type O blood. What

are the possible blood types of the children.

e. In humans hemophilia is a sex-linked recessive trait. Cross a man with hemophilia with a woman with no

family history of hemophilia.

123. Which parent determines the gender of the offspring?

124. When a male inherits a sex-linked trait, which parent did he inherit it from?

125. Describe polygenic inheritance. Give 2 examples.

126. Draw a pedigree of a family with the following characteristics

a. a mother and a father with 2 children – a boy and a girl in that order

b. both children married and had 1 daughter each.

c. in your pedigree, free ear lobes are dominant to attached ear lobes – color in those with free ear lobes

d. the father has free ear lobes along with both of his children and his grandchildren

e. determine the genotype of everyone in the family

127. Fill in the following chart:

|  |  |  |
| --- | --- | --- |
|  | Dominant or Recessive | Summary |
| Cystic Fibrosis |  |  |
| Tay Sachs |  |  |
| PKU |  |  |
| Huntington’s Disease |  |  |

128. Be able to analyze a karyotype.

129. What are first 22 pairs of chromosomes called?

130. What do the last pair of chromosomes tell us?

\*\*\* 13) What is your favorite quote?

131. List 3 environmental factors that influence gene expression.

132. What do each of the following environmental conditions lead to?

a. tobacco use 🡪

b. sun exposure 🡪

c. diet and genetic interaction 🡪

d. diet and genetic interaction 🡪

**UNIT 4: EVOLUTION / CLASSIFICATION**

133. What is evolution?

134. What are the conditions of Earth 4.6 billion years ago?

135. What caused the formation of the oceans?

136. Summarize Miller and Urey’s experiment to recreate how life began on Earth.

137. Which organisms are hypothesized to be the first living things on Earth?

138. Define abiogenesis.

139. Describe the two experiments that disproved abiogenesis:

a. Redi’s

b. Pasteur

140. Define biogenesis.

\*\*\* 14) If you had to be a teacher of something, what would you teach?

141. What is the name of Darwin’s Theory of Evolution?

142. Summarize his theory.

143. Describe the following examples:

a. peppered moth

b. antibiotic resistance

144. What must be present in order for natural selection to occur?

145. List all the evidences of evolution.

146. Summarize and give examples for the following anatomical structures:

a. homologous

b. analogous

c. vestigial

147. What happens during divergent evolution?

148. How is adaptive radiation an example of divergent evolution?

149. What happens during convergent evolution?

150. What is co-evolution? Give an example.

\*\*\*15)What do you miss most about childhood?  
151. Define speciation.

152. List two causes of speciation.

153. List the two time frames for speciation to occur.

154. Draw the graphs for each type of selection found in nature:

a. stabilizing

b. directional (2 graphs)

c. disruptive

155. List all drivers of evolution.

156. Give 3 examples of adaptations.

157. How is pesticide resistance an adaptive advantage?

158. What are the two ways one can obtain active immunity?

159. How do you get passive immunity?

160. What is taxonomy?  
\*\*\*16) Crunchy Peanut Butter or Smooth?

161. Who was the first to classify living things?

162. Which two names make up binominal nomenclature?

163. List the 7 categories of classification in order from broadest to most specific.

164. What is the purpose of a dichotomous key?

165. What is the purpose of a phylogenetic tree? Draw a simple phylogentic tree with differentiation of 4 organisms.

166. Fill in the following chart:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Kingdom | Cell Type | Cell Number | Nutrition | Examples |
| Archaebacteria |  |  |  |  |
| Eubacteria |  |  |  |  |
| Protista |  |  |  |  |
| Fungi |  |  |  |  |
| Plantae |  |  |  |  |
| Animalia |  |  |  |  |

**UNIT 5 : LIVING THINGS (BACTERIA, PROTISTS, PLANTS, AND ANIMALS)**

167. Describe each of the following life functions:

a. transport

b. excretion

c. respiration

d. nutrition

e. reproduction

168. What is a hermaphrodite?

169. Differentiate between internal and external fertilization.

170. Draw and label a typical bacterial cell.

\*\*\*17) Would you live in space if you could never come back to earth? Why or why not?  
171. List and describe the two ways that bacteria reproduce.

172. List 3 ways that bacteria can be useful.

173. What do protists contain to help maintain water levels?

174. What are the three categories of protists?

175. What do euglena have to help them detect sunlight?

176. How amoebas ingest food?

177. How do sporozoans reproduce?

178. How do ciliates move?

179. How do flagellates move?

180. How do fungi get nutrients?  
\*\*\*18) If you could only have one thing on a deserted island what would it be?

181. Why are fungi so important to the ecosystem? (think – circle of life…)

182. How are the cell walls of fungal cells different from those in plant cells?

183. What are the three parts of a plant?

184. What do roots do for a plant?

185. How are root hairs an adaptive advantage?

186. What is the stem responsible for?

187. List and describe the two types of vascular tissue.

188. Nonvascular plants rely on what two processes to transport water and sugar throughout the plant?

189. What happens in the leaves of plants?

190. What are stomata?

\*\*\*19) What is the best gift anyone's ever given you?

191. What controls the stomata?

192. What is the cuticle and what purpose does it serve?

193. What is the difference between evergreens and deciduous plants?

194. Give an example of a nonvascular plant and a vascular plant.

195. What do angiosperms have for reproduction?

196. Draw and label a flower. Label the pistil, stigma, style, ovary, stamen, anther, and filament.

197. Give the functions for each part of the flower:

a. stigma

b. style

c. ovary

d. anther

e. filament

198. What are the two kinds of angiosperms?

199. What is required for fertilization to occur?

200. What do gymnosperms have for reproduction?  
\*\*\*20) Paper or plastic?

201. What are the three parts of a seed?

202. Give one piece of information and one example of each phyla of invertebrates:

a. porifera

b. cnidaria

c. platyhelminthes

d. nematode

e. molluska

f. annelid

g. arthropoda

203. Fill in the following chart:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Breathing – lungs / gills | Endo/Ectothermic | # of heart chambers | Fertilization – internal or external | Examples |
| Fish |  |  |  |  |  |
| AmphibIa |  |  |  |  |  |
| Reptilia |  |  |  |  |  |
| Aves |  |  |  |  |  |
| Mammalia |  |  |  |  |  |

204.Describe each of the following innate animal behaviors:

a. suckling

b. phototaxis

c. chemotaxis

d. migration

e. hibernation

f. estivation

205. Describe each of the following learned animal behaviors:

a. habituation

b. imprinting

c. classical conditioning

d. trial and error

206. Summarize Pavlov’s experiment with dogs.

207. Describe each of the following communicative behaviors:

a. pheromones

b. courtship

c. territory

d. aggression

e. dominance hierarchy

**UNIT 6 : ECOLOGY**

208. How does carbon enter the atmosphere?

209. What is the only way that carbon leaves the atmosphere?

210. What is the greenhouse effect?  
\*\*\*21) Who is your favorite Disney character?

211. What are the consequences of the greenhouse effect?

212. In what state of matter is nitrogen found in the atmosphere?

213. How is nitrogen fixed into a solid?

214. What do plants use nitrogen for?

215. How do animals return nitrogen to the soil?

216. List 2 factors that affect our climate.

217. Which two types of organisms recycle nutrients through the ecosystem?

218. In a food chain, how much energy is transferred from one trophic level to the next?

219. Where does all energy originate from?

220. Describe and give an example of each of the following relationships:

a. mutualism

b. parasitism

c. commensalism

d. competition

e. predator/prey

\*\*\*22) If you could instantly become fluent in another language, what would that language be and why?

221. List three things that would increase the size of a population.

222. List three things that would decrease the size of a population.

223. Define carrying capacity.

224. Define limiting factors and give examples.

225. What is exponential growth?

226. Draw a population graph showing exponential growth in a J curve.

227. Draw a population graph showing a S curve.

228. What is dynamic equilibrium?

229. List 3 reasons for human population growth.

230. Fill in the following chart

|  |  |  |  |
| --- | --- | --- | --- |
|  | Global Warming | Acid Rain | Eutrophication |
| Definition |  |  |  |
| Causes |  |  |  |
| Effects |  |  |  |

\*\*\*23) What is the strangest thing you've ever eaten?   
231. What is bioaccumulation??

232. List three chemicals that have negatively impacted the environment due to bioaccumulation.

233. Define and give an example of an invasive species.

234. Give one way that habitat destruction occurs.

234. Define sustainability.

235. List 3 renewable resources.

236. What is a carbon footprint?

237. What is the purpose of conservation efforts?

238. List 3 stewardship or conservations methods that have the goal of sustaining resources.

Miscellaneous items:

239. How do you use the microscope to view a specimen? Coarse adjustment – fine adjustment?

240. How do you calculate the total magnification for viewing a specimen?  
\*\*\*24) If you could be a cookie what kind of cookie would you be?

241. Draw the interaction of an enzyme with a substrate. Label the enzyme, substrate, product, enzyme-substrate complex.

242. Draw population age pyramids for a country with 1) a rapidly growing population, 2) steady/stable population, 3) decreasing population

243. Create a dichotomous key for identifying sponges, earthworms, arthropods, fish, frogs, lizards, chickens, dogs, and man.

244. Draw an animal cell and plant cell. Label the following items as appropriate: nucleus, nucleolus, cell membrane, cell wall, mitochondria, chloroplast, ER, ribosomes, vacuole, centriole, cytoplasm, Golgi complex

245. Draw and label the following types of protists : amoeba, paramecium, euglena.

\*\*\*25) What has been your favorite topic/lab/activity we did this year in Biology?

CONGRATULATIONS!!!   
YOU SURVIVED THIS PACKET!!! YOU WILL SURVIVE THE EOC!!