**Semester 1 Biology 1 Practice Test**

**You may print this practice test and circle your answer choices. Come to me to discuss any questions you may have, or to check your answers.**

**Many of these questions are directly from the exam with either the answer choices jumbled or restated.**

**Many of these questions are restated entirely than what you will see on the exam.**

**Some of the questions will not be the exam, but will help you further your knowledge of the subject.**

1. Information gathered from observing a plant that grows 3 cm over a two-week period results in

A) inferences. C) hypotheses.

B) variables. D) data.

2. Which of the following is NOT a way that scientists generate hypotheses?

A) using informed, creative imagination

B) using logical inference

C) using prior knowledge

D) using a feeling about what should occur

3. A controlled experiment allows the scientist to isolate and test

A) a conclusion. C) several variables.

B) a mass of information. D) a single variable.

4. The ability to reproduce results is an important part of any

A) hypothesis. C) law.

B) theory. D) experiment.

5. Which of the following is NOT a characteristic of all living things?

A) growth and development C) response to the environment

B) ability to move D) ability to reproduce

6. The amount of light and temperature are examples of

A) factors necessary for life.

B) methods of energy production.

C) factors to which living things respond.

D) factors that affect reproduction.

7. To observe a small living organism, a scientist might use a(an)

A) electronic balance. C) compound light microscope.

B) TEM. D) electron microscope.

8. Which of the following is NOT considered a safety procedure?

A) Read all the steps in your activity before doing it.

B) If in doubt about any part of an activity, trust your instincts.

C) Follow your teacher’s instructions.

D) Follow the textbook direction exactly.

9. Because you may come in contact with organisms you cannot see, what safety procedure MUST be followed?

A) Read over your activity.

B) Open the windows of the laboratory.

C) Wash your hands thoroughly after completing the activity.

D) Do not wear long sleeves.

10. The work of scientists begins with

A) testing a hypothesis. C) creating experiments.

B) careful observations. D) drawing conclusions.

11. Hypotheses may arise from

A) prior knowledge. C) imaginative guesses.

B) logical inferences. D) all of the above

12. A controlled experiment allows the scientist to isolate and test

A) a conclusion. C) several variables.

B) a mass of information. D) a single variable.

13. All of the following are characteristics of all living things EXCEPT

A) growth. C) movement.

B) reproduction. D) use of energy.

14. Biology is the study of

A) the land, water, and air on Earth.

B) living things.

C) animals and plants only.

D) the environment.

15. The process by which organisms keep their internal conditions fairly constant is called

A) homeostasis. C) metabolism

B) evolution. D) photosynthesis.

16. Safety procedures are important when working

A) in a laboratory. C) with animals.

B) in the field. D) all of the above

17. Which of the following makes up a molecule of water?

A) one atom of hydrogen and one atom of oxygen

B) one atom of sodium and one atom of chlorine

C) one atom of hydrogen and two atoms of oxygen

D) two atoms of hydrogen and one atom of oxygen

18. What type of electron is available to form bonds?

A) valence C) ionic

B) nucleus D) covalent

19. Ice floats on water because

A) of cohesion. C) water shrinks when it freezes.

B) ice has a higher density than water. D) water expands when it freezes.

20. The most abundant compound in most living things is

A) carbon dioxide. C) sodium chloride.

B) water. D) sugar.

21. When salt is dissolved in water, water is the

A) reactant. C) solute.

B) solution. D) solvent.

22. A substance with a pH of 6 is called

A) an acid. C) both an acid and a base.

B) a base. D) neither an acid nor a base.

23. A monosaccharide is a

A) carbohydrate. C) nucleic acid.

B) lipid. D) protein.

24. Which statement is true?

A) Simple sugars are made of polysaccharides.

B) Glycerol is made of fatty acids.

C) RNA molecules are made of nucleotides.

D) Amino acids are made of proteins.

25. When hydrogen and oxygen combine to form water, water would be

A) a product. C) both a product and a reactant.

B) a reactant. D) neither a product nor a reactant.

26. Enzymes affect the reactions in living cells by changing the

A) products of the reaction. C) temperature of the reaction.

B) speed of the reaction. D) pH of the reaction.

27. Water molecules are polar, with

A) the oxygen side being slightly positive and the hydrogen side being slightly negative.

B) the oxygen and hydrogen sides being slightly positive.

C) the oxygen and hydrogen sides being slightly negative.

D) the oxygen side being slightly negative and the hydrogen side being slightly positive.

28. A solution is a(an)

A) breaking of a chemical bond.

B) chemical reaction.

C) evenly distributed mixture of two or more substances.

D) combination of two or more liquids.

29. Suspensions are mixtures

A) of water and nondissolved material.

B) in which the components are evenly distributed throughout the solution.

C) both a and b

D) neither a nor b

30. Solutions that contain concentrations of H+ ions lower than pure water

A) have pH values below 7. C) are bases.

B) are acids. D) are enzymes.

31. Which of the following is NOT a function of proteins?

A) store and transmit heredity

B) help to fight disease

C) control the rate of reactions and regulate cell processes

D) used to form bones and muscles

32. What is the term used to describe the energy needed to get a reaction started?

A) adhesion energy C) cohesion energy

B) activation energy D) chemical energy

33. A substance that speeds up the rate of a chemical reaction is called a(an)

A) catalyst. C) molecule.

B) lipid. D) element.

34. The work of Schleiden and Schwann can be summarized by saying that

A) all plants are made of cells.

B) all animals are made of cells.

C) plants and animals have specialized cells.

D) all plants and animals are made of cells.

35. Which of the following is NOT found in the nucleus?

A) cytoplasm C) chromatin

B) nucleolus D) DNA

36. Eukaryotes usually contain

A) a nucleus. C) genetic material.

B) specialized organelles. D) all of the above

37. Which structures carry out cell movement?

A) cytoplasm and ribosomes

B) nucleolus and nucleus

C) microtubules and microfilaments

D) chromosomes

38. Which organelle makes proteins using coded instructions that come from the nucleus?

A) Golgi apparatus C) vacuole

B) mitochondrion D) ribosome

39. Which organelle converts the chemical energy stored in food into compounds that are more convenient for the cell to use?

A) chloroplast C) endoplasmic reticulum

B) Golgi apparatus D) mitochondrion

40. Which of the following is a function of the cell membrane?

A) breaks down lipids, carbohydrates, and proteins from foods

B) stores water, salt, proteins, and carbohydrates

C) keeps the cell wall in place

D) regulates which materials enter and leave the cell

41. Diffusion occurs because

A) molecules constantly move and collide with one another.

B) the concentration of a solution is never the same throughout a solution.

C) the concentration of a solution is always the same throughout a solution.

D) molecules never move or collide with one another.

42. An animal cell that is surrounded by fresh water will burst because the osmotic pressure causes

A) water to move into the cell. C) solutes to move into the cell.

B) water to move out of the cell. D) solutes to move out of the cell.

43. Who was the first person to identify and see cells?

A) Anton van Leeuwenhoek C) Matthias Schleiden

B) Robert Hooke D) Rudolf Virchow

44. The thin, flexible barrier around a cell is called the

A) cell membrane. C) cell envelope.

B) cell wall. D) cytoplasm.

45. Prokaryotes lack

A) cytoplasm. C) a nucleus.

B) a cell membrane. D) genetic material.

46. Which of the following contains a nucleus?

A) prokaryotes C) eukaryotes

B) bacteria D) organelles

47. The main function of the cell wall is to

A) support and protect the cell. C) direct the activities of the cell.

B) store DNA. D) help the cell move.

48. Which organelle would you expect to find in plant cells?

A) mitochondrion C) chloroplast

B) ribosome D) smooth endoplasmic reticulum

49. Diffusion is the movement of particles from

A) an area of low concentration to an area of high concentration.

B) an area of high concentration to an area of low concentration.

C) an area of equilibrium to an area of high concentration.

D) all of the above

50. The diffusion of water across a selectively permeable membrane is called

A) osmotic pressure. C) facilitated diffusion.

B) osmosis. D) active transport.

51. Which of the following is an autotroph?

A) mushroom C) monkey

B) dog D) tree

52. Which of the following is NOT an example of a heterotroph?

A) mushroom C) grass

B) leopard D) human

53. Energy is released from ATP when

A) a phosphate group is added. C) ATP is exposed to sunlight.

B) adenine bonds to ribose. D) a phosphate group is removed.

**Figure 8-1**

54. Look at Figure 8-1. All of the following are parts of an ADP molecule EXCEPT

A) structure A. C) structure C.

B) structure B. D) structure D.

55. Which structures shown in Figure 8-1 make up an ATP molecule?

A) A and B C) A, B, C, and D

B) A, B, and C D) C and D

56. In Figure 8-1, between which parts of the molecule must the bonds be broken to form an ADP molecule?

A) A and B C) C and D

B) B and C D) all of the above

57. Which scientists showed that plants need light to grow?

A) van Helmont and Calvin C) van Helmont and Priestley

B) Priestley and Ingenhousz D) Priestley and Calvin

58. Which of the following are used in the overall reactions for photosynthesis?

A) carbon dioxide C) light

B) water D) all of the above

59. A granum is a(an)

A) stack of chloroplasts. C) membrane enclosing a thylakoid.

B) stack of thylakoids. D) photosynthetic pigment molecule.

60. The light-collecting units of a chloroplast are the

A) electron carriers. C) stroma.

B) photosystems. D) high-energy sugars.

61. What are the products of the light-dependent reactions?

A) oxygen gas C) NADPH

B) ATP D) all of the above

62. The Calvin cycle takes place in the

A) stroma. C) thylakoid membranes.

B) photosystems. D) chlorophyll molecules.

63. If carbon dioxide is removed from a plant’s environment, what would you expect to happen to its production of high-energy sugars?

A) More sugars will be produced.

B) No sugars will be produced.

C) The same number of sugars will be produced but without carbon dioxide.

D) Carbon dioxide does not affect the production of high-energy sugars in plants.

64. If you continue to increase the intensity of light that a plant receives, what happens?

A) The rate of photosynthesis increases with light intensity.

B) The rate of photosynthesis decreases with light intensity.

C) The rate of photosynthesis increases and then levels off.

D) The rate of photosynthesis does not change.

65. Organisms, such as plants, that make their own food are called

A) autotrophs. C) thylakoids.

B) heterotrophs. D) pigments.

66. Organisms that cannot make their own food and must obtain energy from the foods they eat are called

A) autotrophs. C) thylakoids.

B) heterotrophs. D) plants.

67. Which of the following is NOT a part of an ATP molecule?

A) adenine C) chlorophyll

B) ribose D) phosphate

68. Jan van Helmont concluded that plants gain most of their mass from

A) water. C) carbon dioxide in the air.

B) the soil. D) oxygen in the air.

69. Ingenhousz showed that plants produce oxygen bubbles when exposed to

A) ATP. C) light.

B) carbon dioxide. D) a burning candle.

70. Photosynthesis uses sunlight to convert water and carbon dioxide into

A) oxygen. C) ATP and oxygen.

B) high-energy sugars. D) oxygen and high-energy sugars.

71. Where do the light-dependent reactions take place?

A) in the stroma C) in the thylakoid membranes

B) outside the chloroplasts D) only in chlorophyll molecules

72. Where are photosystems I and II found?

A) in the stroma C) in the Calvin cycle

B) in the thylakoid membrane D) all of the above

73. Which of the following affects the rate of photosynthesis?

A) water C) light intensity

B) temperature D) all of the above

74. Which of the following is NOT a stage of cellular respiration?

A) fermentation C) glycolysis

B) electron transport D) Krebs cycle

75. What are the reactants in the equation for cellular respiration?

A) oxygen and lactic acid C) glucose and oxygen

B) carbon dioxide and water D) water and glucose

76. The starting molecule for glycolysis is

A) ADP. C) citric acid.

B) pyruvic acid. D) glucose.

77. One cause of muscle soreness is

A) alcoholic fermentation. C) lactic acid fermentation.

B) glycolysis. D) the Krebs cycle.

78. Which process is used to produce beer and wine?

A) lactic acid fermentation C) alcoholic fermentation

B) glycolysis D) the Krebs cycle

79. The conversion of pyruvic acid into lactic acid requires

A) alcohol. C) ATP.

B) oxygen. D) NADH.

80. During one turn, the Krebs cycle produces

A) oxygen. C) electron carriers.

B) lactic acid. D) glucose.

81. Cellular respiration uses one molecule of glucose to produce

A) 2 ATP molecules. C) 36 ATP molecules.

B) 34 ATP molecules. D) 38 ATP molecules.

82. Breathing heavily after running a race is your body’s way of

A) making more citric acid.

B) repaying an oxygen debt.

C) restarting glycolysis.

D) recharging the electron transport chain.

83. All of the following are sources of energy during exercise EXCEPT

A) stored ATP. C) lactic acid fermentation.

B) alcoholic fermentation. D) cellular respiration.

84. Which process does NOT release energy from glucose?

A) glycolysis C) fermentation

B) photosynthesis D) cellular respiration

85. Photosynthesis is to chloroplasts as cellular respiration is to

A) chloroplasts. C) mitochondria.

B) cytoplasm. D) nucleus.

86. Plants cannot release energy from glucose using

A) glycolysis. C) the Krebs cycle.

B) photosynthesis. D) cellular respiration.

87. Which of the following is released during cellular respiration?

A) oxygen C) energy

B) air D) lactic acid

88. Cellular respiration releases energy by breaking down

A) food molecules. C) carbon dioxide.

B) ATP. D) water.

89. Which of these is a product of cellular respiration?

A) oxygen C) glucose

B) water D) all of the above

90. Which of these processes takes place in the cytoplasm of a cell?

A) glycolysis C) Krebs cycle

B) electron transport D) all of the above

91. Glycolysis provides a cell with a net gain of

A) 2 ATP molecules. C) 18 ATP molecules.

B) 4 ATP molecules. D) 36 ATP molecules.

92. Lactic acid fermentation occurs in

A) bread dough.

B) any environment containing oxygen.

C) muscle cells.

D) mitochondria.

93. In the presence of oxygen, glycolysis is followed by

A) lactic acid fermentation. C) photosynthesis.

B) alcoholic fermentation. D) the Krebs cycle.

94. Cellular respiration is called an aerobic process because it requires

A) light. C) oxygen.

B) exercise. D) glucose.

95. The starting molecule for the Krebs cycle is

A) glucose. C) pyruvic acid.

B) NADH. D) coenzyme A.

96. In eukaryotes, electron transport occurs in the

A) mitochondria. C) cell membrane.

B) chloroplasts. D) cytoplasm.

97. Unlike photosynthesis, cellular respiration occurs in

A) animal cells only. C) all but plant cells.

B) plant cells only. D) all eukaryotic cells.

98. The products of photosynthesis are the

A) products of cellular respiration. C) products of glycolysis.

B) reactants of cellular respiration. D) reactants of fermentation.

99. As a cell becomes larger, its

A) volume increases faster than its surface area.

B) surface area increases faster than its volume.

C) volume increases, but its surface area stays the same.

D) surface area stays the same, but its volume increases.

100. All of the following are problems that growth causes for cells EXCEPT

A) DNA overload. C) obtaining enough food.

B) excess oxygen. D) expelling wastes.

101. Which of the following is NOT a way that cell division solves the problems of cell growth?

A) Cell division provides each daughter cell with its own copy of DNA.

B) Cell division increases the mass of the original cell.

C) Cell division increases the surface area of the original cell.

D) Cell division reduces the original cell’s volume.

102. When during the cell cycle are chromosomes visible?

A) only during interphase C) only during the M phase

B) only when they are being replicated D) only during the G1 phase

103. When during the cell cycle is a cell’s DNA replicated?

A) G1 phase C) S phase

B) G2 phase D) M phase

104. Which event occurs during interphase?

A) The cell grows.

B) Centrioles appear.

C) Spindle fibers begin to form.

D) Centromeres divide.

105. During which phase of mitosis do the chromosomes line up along the middle of the dividing cell?

A) prophase C) metaphase

B) telophase D) anaphase

106. Which of the following represents the phases of mitosis in their proper sequence?

A) prophase, metaphase, anaphase, telophase

B) interphase, prophase, metaphase, anaphase, telophase

C) interphase, prophase, metaphase, telophase

D) prophase, metaphase, anaphase, telophase, cytokinesis

107. The two main stages of cell division are called

A) mitosis and interphase. C) the M phase and the S phase.

B) synthesis and cytokinesis. D) mitosis and cytokinesis.

108. Which of the following is a factor that can stop normal cells from growing?

A) contact with other cells

B) growth factors

C) a cut in the skin

D) cyclin that has been taken from a cell in mitosis

109. Which of the following explains why normal cells grown in a petri dish tend to stop growing once they have covered the bottom of the dish?

A) The cells lack cyclin.

B) The petri dish inhibits cell growth.

C) Contact with other cells stops cell growth.

D) Most cells grown in petri dishes have a defective p53.

110. Cancer is a disorder in which some cells have lost the ability to control their

A) size. C) growth rate.

B) spindle fibers. D) surface area.

111. As a cell grows, it

A) places more demands on its DNA.

B) uses up food and oxygen more quickly.

C) has more trouble moving enough materials across its cell membrane.

D) all of the above

112. Compared with small cells, large cells have more trouble

A) dividing.

B) producing daughter cells.

C) moving needed materials in and waste products out.

D) making copies of their DNA.

113. The process by which a cell divides into two daughter cells is called

A) cell division. C) interphase.

B) metaphase. D) mitosis.

114. Which of the following happens when a cell divides?

A) The cell’s volume increases.

B) It becomes more difficult for the cell to get enough oxygen and nutrients.

C) The cell has DNA overload.

D) Each daughter cell receives its own copy of the parent cell’s DNA.

115. Which of the following is a phase in the cell cycle?

A) G1 phase C) M phase

B) G2 phase D) all of the above

**Figure 10-2**

116. ell division is represented in Figure 10-2 by the letter?

A) A. C) C.

B) B. D) D.

117. The cell cycle is the

A) series of events that cells go through as they grow and divide.

B) period of time between the birth and the death of a cell.

C) time from prophase until cytokinesis.

D) time it takes for one cell to undergo mitosis.

**Figure 10-3**

118. The structure labeled A in Figure 10-3 is called the

A) centromere. C) sister chromatid.

B) centriole. D) spindle.

119. The structures labeled B in Figure 10-3 are called

A) centromeres. C) sister chromatids.

B) centrioles. D) spindles.

120. Which of the following is a phase of mitosis?

A) cytokinesis C) anaphase

B) interphase D) S phase

121. The first phase of mitosis is called

A) prophase. C) metaphase.

B) anaphase. D) interphase.

122. In which phase of mitosis do chromosomes become visible?

A) prophase C) metaphase

B) interphase D) telophase

123. What happens when cells come into contact with other cells?

A) They divide more quickly. C) They produce cyclins.

B) They stop growing. D) They produce p53.

124. In eukaryotic cells, the timing of the cell cycle is regulated by

A) the centrioles. C) the spindle.

B) cyclins. D) all of the above

125. What is a tumor?

A) an accumulation of cyclins

B) a mass of cancer cells

C) the rapidly dividing cells found at the site of a wound

D) a defective p53 gene

 126. A theory

A) is always true.

B) is the opening statement of an experiment.

C) may be revised or replaced.

D) is a problem to be solved.

127. A well-tested explanation that unifies a broad range of observations is a(an)

A) hypothesis. C) inference.

B) theory. D) controlled experiment.

128. An instrument that allows light to pass through the specimen and uses two lenses to form an image is a(an)

A) compound light microscope. C) TEM.

B) electron microscope. D) SEM.

129. Which of the following organic compounds is the main source of energy for living things?

A) carbohydrates C) nucleic acids

B) lipids D) proteins

130. What is the process that changes one set of chemicals into another set of chemicals?

A) cohesion C) chemical reaction

B) adhesion D) dissolving

131. Which cell structure contains the cell’s genetic material and controls many of the cell’s activities?

A) organelle C) cell envelope

B) nucleus D) cytoplasm

132. Cells fall into two broad categories, depending on whether they

A) have a cell wall. C) have a nucleus.

B) contain genetic material. D) contain chloroplasts.

133. Which organelle breaks down compounds into small particles that the cell can use?

A) Golgi apparatus C) endoplasmic reticulum

B) lysosome D) mitochondrion

134. Which of the following is a function of the nucleus?

A) stores DNA

B) controls most of the cell’s processes

C) contains the information needed to make proteins

D) all of the above

135. Which of the following is a function of the cytoskeleton?

A) helps a cell keep its shape

B) contains DNA

C) surrounds the cell

D) helps make proteins

136. Which of the following structures serves as the cell’s boundary from its environment?

A) mitochondrion C) chloroplast

B) cell membrane D) channel proteins

137. Most plants appear green because chlorophyll

A) does not absorb green light. C) absorbs green light.

B) reflects violet light. D) none of the above

138. Which step is the beginning of photosynthesis?

A) Pigments in photosystem I absorb light.

B) Pigments in photosystem II absorb light.

C) High-energy electrons move through the electron transport chain.

D) ATP synthase allows H+ ions to pass through the thylakoid membrane.

139. Plants gather the sun’s energy with light-absorbing molecules called

A) pigments. C) chloroplasts.

B) thylakoids. D) glucose.

140. Plants take in the sun’s energy by absorbing

A) high-energy sugars. C) chlorophyll b.

B) chlorophyll a. D) sunlight.

141. The stroma is the space that surrounds

A) thylakoids. C) plant cells.

B) chloroplasts. D) all of the above

142. The Calvin cycle is another name for

A) light-independent reactions.

B) light-dependent reactions.

C) photosynthesis.

D) all of the above

143. What is a product of the Calvin cycle?

A) oxygen gas C) high-energy sugars

B) ATP D) carbon dioxide

144. Which of the following passes high-energy electrons into the electron transport chain?

A) NADH and FADH2 C) citric acid

B) ATP and ADP D) acetyl-CoA

145. The energy of the electrons passing along the electron transport chain is used to make

A) lactic acid. C) alcohol.

B) citric acid. D) ATP.

146. When the body needs to exercise for longer than 90 seconds, it generates ATP by carrying out

A) lactic acid fermentation. C) cellular respiration.

B) alcoholic fermentation. D) glycolysis.

147. Which pair is correct?

A) G1 phase, DNA replication C) S phase, cell division

B) G2 phase, preparation for mitosis D) M phase, cell growth

148. What is the role of the spindle during mitosis?

A) It helps separate the chromosomes. C) It duplicates the DNA.

B) It breaks down the nuclear membrane. D) It divides the cell in half.

149. Cyclins are a family of closely related proteins that

A) regulate the cell cycle. C) cause cancer.

B) produce p53. D) work to heal wounds.