Name _____ Date _____ Class _____

DIAGNOSTIC TEST A, Part 1

1. If you see the symbol of a skull and crossbones on a bottle in a laboratory experiment, you are being advised that you are

A working with chemicals that could be hazardous.
B not to touch an electrical outlet with wet hands.
C to notify your teacher if you taste a poisonous chemical.
D not to work with animals of any kind.

2. The process of science starts with

A a hypothesis.
B a theory.
C a conclusion.
D an observation.

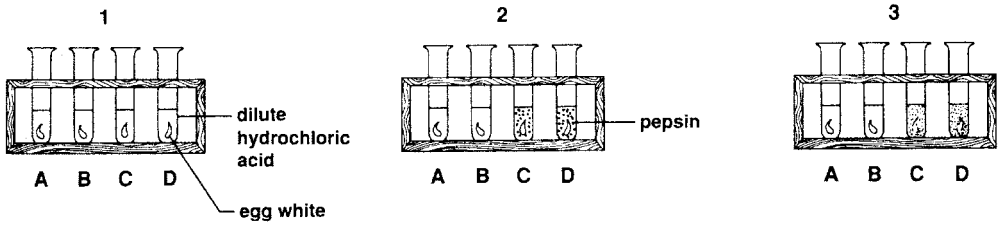
3. If you are using a light microscope to observe a stained slide, you are using a

A phase contrast microscope.
B dark field microscope.
C Nomarski microscope.
D compound microscope.

4. All types of living things do each of the following **EXCEPT**

A grow and develop.
B reproduce.
C destroy the environment.
D respond to stimuli.

Directions: *Use the diagram to answer question 5.*



5. Vincent wanted to confirm the statement that pepsin is needed in addition to hydrochloric acid to digest protein in the stomach. He placed equal-sized pieces of egg white (protein) and equal amounts of dilute hydrochloric acid in each of four test tubes. Then he added a pinch of pepsin to test tubes C and D. He placed all four test tubes in a warm place overnight. The next day, two of the test tubes were milky white. What is the variable in the experiment described here?

A Concentration of hydrochloric acid
B Presence of pepsin
C Location of the tubes
D Size of the egg whites

GO ON

DIAGNOSTIC TEST A, Part 1 *(continued)*

6. The most abundant compound in living things is

A carbon dioxide.
B water.
C sodium chloride.
D sugar.

7. Each of the following is a major role of lipids in living organisms **EXCEPT** the

A formation of biological membranes.
B action as chemical messengers.
C storage of energy.
D movement of cells.

8. Enzymes are **NOT** important in

A regulating chemical pathways.
B transferring information.
C determining the pH of a substance.
D releasing energy.

9. The energy levels surrounding the nucleus of an atom contain

A protons.
B electrons.
C neutrons.
D ions.

10. A covalent bond is formed by

A sharing electrons.
B transferring electrons.
C losing electrons.
D gaining electrons.

11. Primary consumers are also known as

A carnivores.
B herbivores.
C decomposers.
D scavengers.

12. Energy flows through an ecosystem from the sun to

A producers and then consumers.
B consumers and then producers.
C primary consumers.
D secondary consumers.

13. Nutrients move through the biosphere in nutrient or

A carbon cycles.
B nitrogen cycles.
C biogeochemical cycles.
D water cycles.

14. Earth's biosphere includes

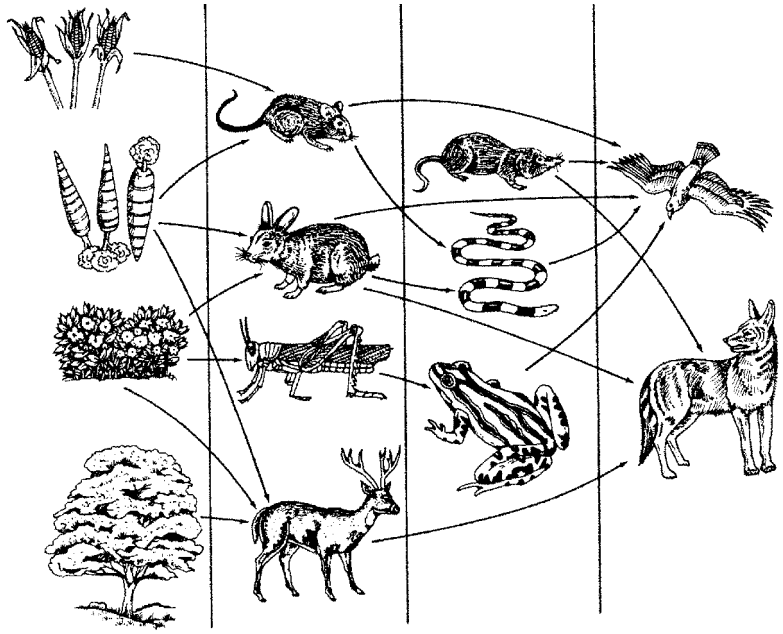
A all life and organic matter in the oceans.
B all life and organic matter in soil and on land.
C all life and organic matter in the atmosphere.
D all of the above.

Name _____ Date _____ Class _____

DIAGNOSTIC TEST A, Part 1 *(continued)*

Directions: *Use the diagram to answer question 15.*

A Food Web in an Area Around a Farmhouse



15. According to the diagram, how many different types of primary consumers are eaten by snakes?

A One
B Two
C Three
D Four

16. Parasitism is a type of

A commensalism. **C** symbiosis.
B mutualism. **D** predation.

17. The end result of ecological succession is usually

A a climax community.
B an unstable community.
C an aquatic biome.
D a land biome.

18. The biome that is dominated by coniferous forests and that is inhabited by wolves, black bears, and elk is the

A tundra.
B grassland.
C taiga.
D temperate deciduous forest.

19. The distinct zones of the ocean depend upon

A distance from shore and temperature.
B distance from shore and depth.
C temperature and types of organisms.
D types of organisms and distance from shore.

20. The typical weather pattern in an area over a long period of time is called

A climate. **C** the water cycle.
B precipitation. **D** weather.

21. The various growth phases through which most populations go are represented on

A a logistic growth curve.
B an exponential growth curve.
C a normal growth curve.
D a boom and bust curve.

GO ON

Name _____ Date _____ Class _____

DIAGNOSTIC TEST A, Part 1 *(continued)*

22. Exponential growth is the phase in which a population

A reaches carrying capacity.
B grows quickly and few animals die.
C growth begins to slow down.
D growth stops.

23. Among animal populations, crowding and stress

A prevent parasitism.
B prevent predator-prey relationships.
C are density-independent limiting factors.
D are density-dependent limiting factors.

24. The carrying capacity of a particular environment for a particular species is the size of the population during

A logistic growth.
B exponential growth.
C the steady state.
D density independence.

25. Human population growth has slowed down in

A China.
B the United States.
C India.
D Africa.

26. In the very distant past, most people did **NOT**

A live in small tribes.
B live in permanent settlements.
C gather plants.
D hunt animals.

27. The first, and perhaps the best known, case of biological magnification involved the pesticide

A PCB.
B Dieldrin.
C NO_2.
D DDT.

28. Acid rain occurs over the northeastern United States largely because of the production of

A nitrogen oxide from burning coal.
B sulfur oxide from burning coal.
C nitrogen dioxide from car exhausts.
D sulfur oxide from car exhausts.

29. Which of the following is a renewable resource?

A Water
B Coal
C Natural gas
D Oil

30. Solid wastes can be processed and used again through

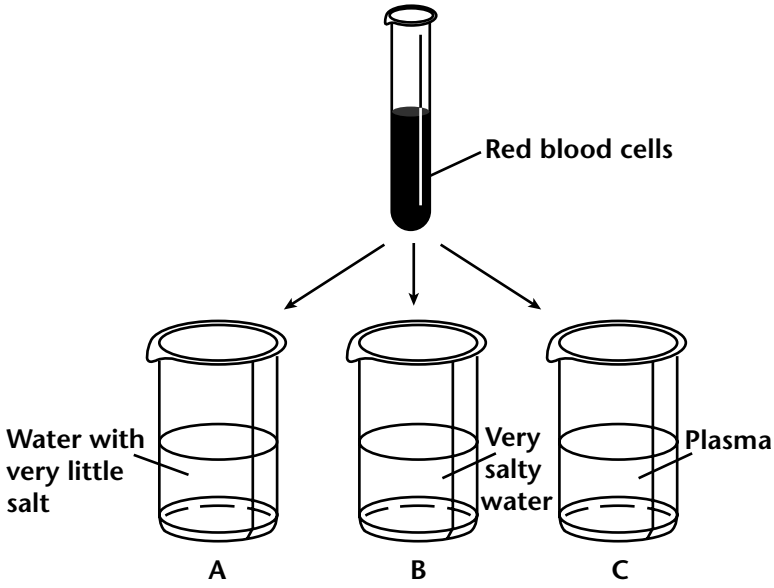
A inversion.
B reforestation.
C sewage treatment.
D recycling.

GO ON

DIAGNOSTIC TEST A, Part 1 *(continued)*

Directions: *Use the diagram to answer question 31.*

Passive Transport in Red Blood Cells



31. What would happen if some of the red blood cells were placed in beaker A?

- **A** Water would move into the cells by osmosis, causing them to swell.
- **B** Water would leave the cells by osmosis, causing them to shrink.
- **C** Water would be exchanged evenly through the cell membrane, causing cells to retain their shape.
- **D** None of the above

32. Which of the following lists the levels of cell organization from least to most complex?

- **A** Organs, cells, organ systems, tissues
- **B** Cells, tissues, organs, organ systems
- **C** Tissues, organs, organ systems, cells
- **D** Cells, organs, organ systems, tissues

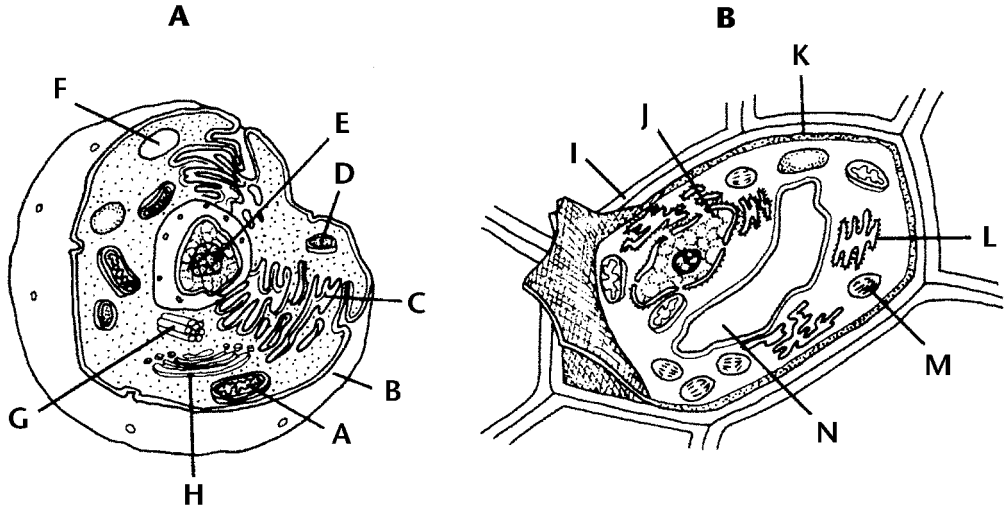
33. The idea that all cells arise from the division of preexisting cells was first stated by

- **A** Anton van Leeuwenhoek.
- **B** Rudolf Virchow.
- **C** Robert Hooke.
- **D** Robert Brown.

Name _____ Date _____ Class _____

DIAGNOSTIC TEST A, Part 1 *(continued)*

Directions: *Use the diagram to answer questions 34 and 35.*



34. Which structure in cell A corresponds to Structure N in cell B?

A Structure A
B Structure B
C Structure G
D Structure F

35. What is the function of Structure D?

A To direct cell activities
B To break down material
C To produce proteins
D To store materials

36. Joseph Priestley used a candle and a sprig of mint to determine that plants release

A O_2.
B CO_2.
C H_2O.
D $C_6H_{12}O_6$.

37. In a plant, the only pigment that processes light energy is

A red pigment.
B chlorophyll.
C blue pigment.
D purple pigment.

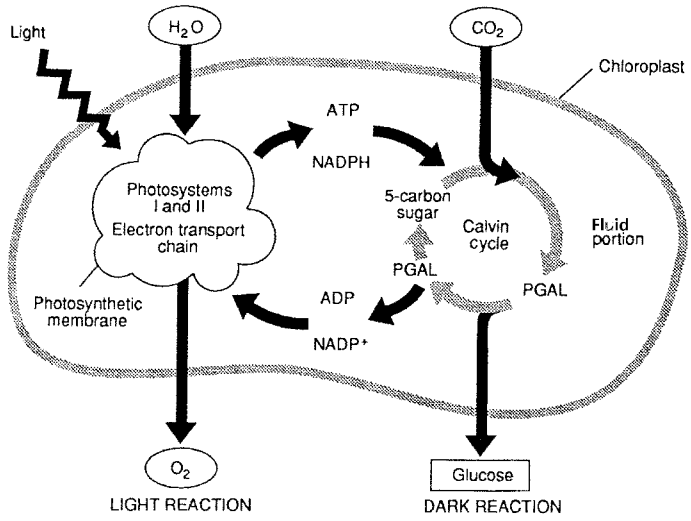
GO ON

Name _____ Date _____ Class _____

DIAGNOSTIC TEST A, Part 1 *(continued)*

Directions: *Use the diagram to answer questions 38 through 40.*

Light and Dark Reactions Within a Chloroplast of a Plant



38. Which of the following is **NOT** an energy-storing compound?

A ADP
B NADP
C NADPH
D FAD

39. According to the diagram, what substances contain the chemical energy produced in the light reaction?

A ATP and ADP
B ATP and NADPH
C ADP and NADPH
D ADP and NADP+

40. What is the source of the ADP and $NADP^+$ shown in the diagram?

A The Calvin cycle
B The light reaction
C The electron transport chain
D None of the above

41. The first of these processes in respiration is

A the Calvin cycle.
B the Krebs cycle.
C electron transport.
D ADP synthesis.

42. Which of the following is **NOT** used to release energy from glucose?

A Photosynthesis
B Glycolysis
C Cellular respiration
D Respiration

43. In the body, the breakdown of a molecule of glucose releases about

A 2 percent of its energy.
B 38 percent of its energy.
C 50 percent of its energy.
D 99 percent of its energy.

GO ON

DIAGNOSTIC TEST A, Part 1 *(continued)*

44. During respiration, the electron transport chain in mitochondria takes place

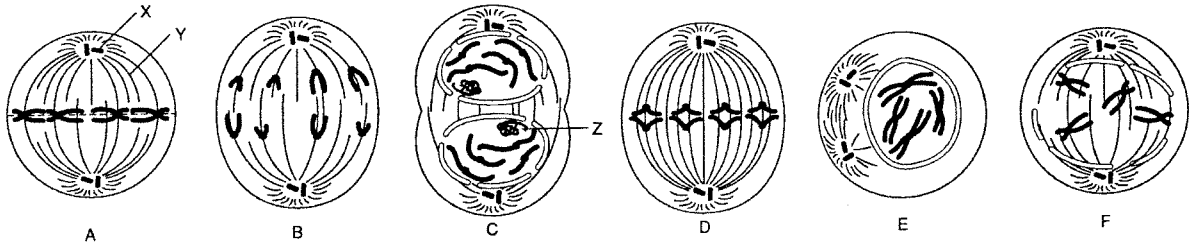
A in the area enclosed by the inner membrane.
B outside the inner membrane.
C within the inner membrane itself.
D within the outer membrane.

45. In both plants and animals, food molecules are broken down and CO_2 is released by

A respiration.
B the carbon cycle.
C breathing.
D glycolysis.

Directions: *Use the diagram to answer question 46.*

Mitosis in a Eukaryotic Cell (not shown in order)



46. List the correct order for the stages of mitosis shown in the diagram.

A D, B, C, A, E, F
B E, F, A, D, B, C
C F, A, D, B, E, C
D C, E, F, A, D, B

47. Cancer is a disorder in which some cells lose the ability to control their

A size.
B weight.
C mass.
D growth rate.

48. The two main stages of cell division are

A mitosis and interphase.
B synthesis and mitosis.
C mitosis and cytokinesis.
D cytokinesis and interphase.

49. As a result of mitosis in a human body cell, each of the two nuclei formed has

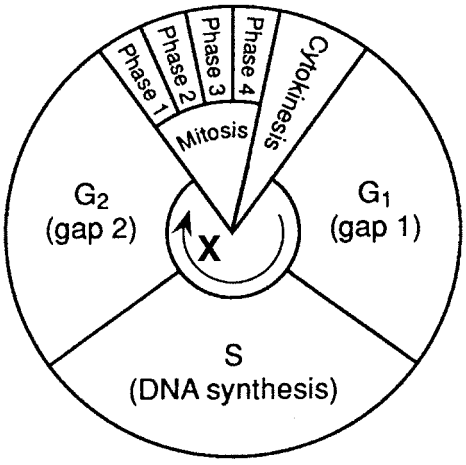
A a duplicate set of chromosomes.
B 92 chromosomes.
C 23 chromosomes.
D no duplicate chromosomes.

GO ON

DIAGNOSTIC TEST A, Part 1 *(continued)*

Directions: *Use the diagram to answer question 50.*

Various Stages in the Cell Cycle of a Particular Cell



50. What is the name of the phase labeled X?

A Prophase
B Metaphase
C Interphase
D Telophase

51. The effects of a dominant allele are seen even if it is present with a contrasting trait according to Mendel's principle of

A segregation.
B dominance.
C blending inheritance.
D independent assortment.

52. Mendel proposed that during the formation of a reproductive cell, the alleles for a given trait

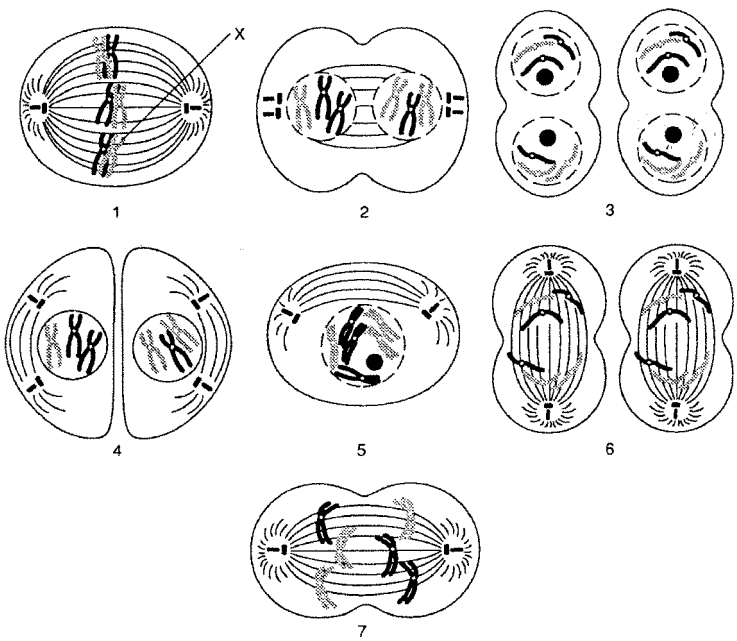
A combine.
B separate.
C fuse.
D disappear.

53. Reduction division occurs during

A segregation.
B independent assortment.
C meiosis.
D mitosis.

Directions: *Use the diagram to answer question 54.*

Seven Stages of Meiosis (not shown in order)



54. Using the appropriate numbers, place the stages of meiosis in their proper order.

A 5, 1, 7, 2, 4, 6, 3
B 7, 1, 2, 6, 3, 5, 4
C 4, 5, 7, 1, 3, 6, 2
D 5, 3, 7, 2, 6, 1, 4

GO ON

DIAGNOSTIC TEST A, Part 1 *(continued)*

55. A Punnett square is used to determine the
- **A** result of meiosis I.
- **B** result of segregation.
- **C** probable outcome of a cross.
- **D** actual outcome of a cross.

56. The Hershey-Chase experiments on bacteriophages showed conclusively that the genetic code was carried in
- **A** a viral coat.
- **B** bacterial cytoplasm.
- **C** DNA.
- **D** RNA.

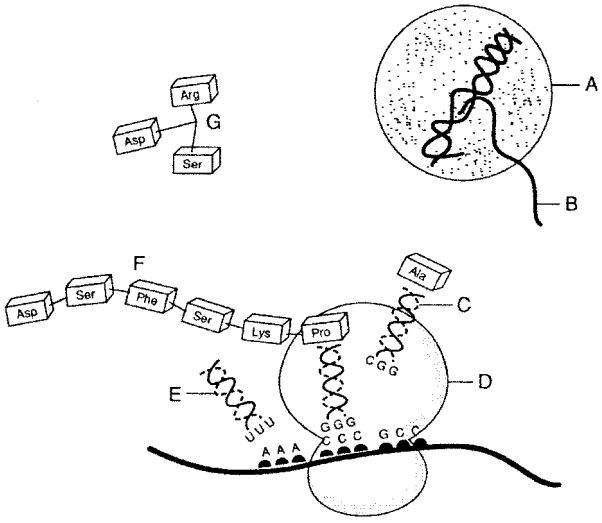
57. A molecule of DNA does **NOT**
- **A** include lipids.
- **B** contain nucleotides.
- **C** store genetic information.
- **D** duplicate itself.

58. When Griffith injected mice with a mixture of live, harmless bacteria and heat-killed pneumonia-causing bacteria, the mice
- **A** died but not from pneumonia.
- **B** had no pneumonia bacteria in their cells.
- **C** did not develop pneumonia.
- **D** developed pneumonia.

59. The two strands of a DNA double helix are held together by
- **A** ionic bonding.
- **B** "start" signals.
- **C** base pairing.
- **D** RNA polymerase.

Directions: *Use the diagram to answer question 60.*

Protein Synthesis



60. In the diagram, information from mRNA is used to produce proteins. What is this process called?
- **A** Transcription
- **B** Translation
- **C** Replication
- **D** Gene regulation

GO ON

Name _____ Date _____ Class _____

DIAGNOSTIC TEST A, Part 1 *(continued)*

61. Luther Burbank produced over 250 new varieties of plants by

A inbreeding. **C** selective breeding.
B hybridization. **D** mutagenesis.

62. Which step is **NOT** essential in order to produce recombinant DNA?

A Cutting the desired gene from the surrounding genes
B Combining the desired genes with DNA from the recipient gene
C Inserting the combined DNA into a cell of a living organism
D Reading the sequence of nucleotides in the gene being manipulated

63. It is easiest to put recombinant DNA back into living cells by inserting the DNA into

A the original organism.
B bacteria.
C viruses.
D yeasts.

64. Thus far, genetically engineered bacteria have **NOT** been used to produce human

A interferon.
B insulin.
C growth hormones.
D Tay-Sachs genes.

65. Seedless oranges, which maintain inheritable changes in DNA, are an example of a

A useful mutation.
B harmful mutation.
C product of hybridization.
D product of selective breeding.