

Student Name: _____

Biology TEST-1



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Biology

DIRECTIONS

Read each question and choose the BEST answer.

SAMPLE A

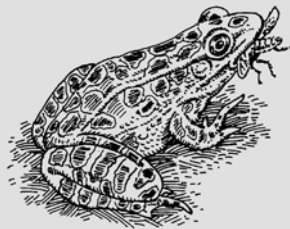
Which of the following tools would a biologist MOST likely use to help magnify specimens?

- A** Hand lens and ruler
- B** Microscope and hand lens
- C** Camera and computer
- D** Telescope and compass

SAMPLE B

Adult frogs feed on insects. Which type of consumer is the frog?

- A** Producer
- B** Carnivore
- C** Herbivore
- D** Parasite



1.

Lab Notes

- **Chromatids have been separated**
- **The cytoplasm is separating**
- **A visible line is forming between sets of chromatids**

Which phase of mitosis is being described in the lab notes shown above?

- A Telophase
 - B Anaphase
 - C Metaphase
 - D Prophase
-

2. **Oxygen is added to an ecosystem by —**

- A cellular respiration.
 - B photosynthesis.
 - C the nitrogen cycle.
 - D dehydration.
-

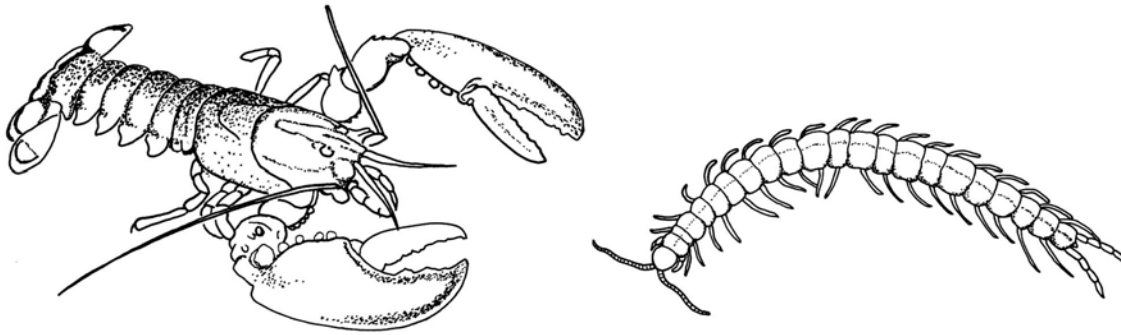
3. **Solvents used in chromatography are often flammable. Which of the following should NOT be allowed in the room when chromatography is performed?**

- A Fire extinguisher
 - B Hot plates
 - C Open flames
 - D Computers
-

4. **Humans may have type O, A, B, or AB blood. This blood type is a trait that is determined by —**

- A a double crossover on the X chromosome.
 - B multiple alleles.
 - C genes on Y chromosomes only.
 - D three homologous chromosomes.
-

5.



Lobsters and centipedes are both classified as Arthropods because they have jointed appendages and —

- A thoracic segments.
 - B internal gills.
 - C an exoskeleton.
 - D radial symmetry.
-

6. **Which of the following pathways of energy flow would give the final consumer the smallest percentage of original energy available in a food chain?**

- A Grass → grasshopper → robin → hawk
 - B Grass → grasshopper → frog → snake → hawk
 - C Grass → mouse → wolf
 - D Grass → mouse → snake → hawk
-

7. **Endoplasmic reticulum is to mitochondrion as road is to —**

- A control center.
 - B generator.
 - C storage tank.
 - D toll gate.
-

8. Ionic and covalent compounds are alike in that they BOTH —

- A form ions.
 - B share electrons.
 - C lose outer electrons.
 - D fill outer electron levels.
-

9. Which of the following can NOT be used to measure volume?

- A Balances
 - B Beakers
 - C Pipettes
 - D Graduated cylinders
-

10. A single isolated gene can be cloned MOST rapidly using genetically engineered —

- A bacteria.
 - B nematodes.
 - C sea anemones.
 - D pea plants.
-

11. Members of the same species found in an ecosystem are called a —

- A family.
 - B population.
 - C niche.
 - D community.
-

12. Some bacteria are greenish in color and live on the surface of water. These organisms are probably —

- A consumers.
 - B producers.
 - C parasites.
 - D saprophytes.
-

13. The eye is considered an organ because it —

- A is made up of different tissues working together.
 - B requires light energy to function correctly.
 - C contains a fluid-filled central cavity.
 - D is almost completely surrounded by bone.
-

14. Cell walls are made of cellulose, a complex carbohydrate. Which of the following compounds is the basic unit of the cell wall?

- A Amino acids
 - B Sugars
 - C Lipids
 - D Nucleic acids
-

15. A social researcher conducted an experiment to test the effect of sleep deprivation on reaction times. Fifty working adults in an evening study were awakened every 2 hours during an 8-hour period at night and were asked to catch a tennis ball fired from a machine at exactly 20 miles per hour.

Which of the following would NOT be an effective added control for the experiment?

- A Participants' diets are restricted.
 - B Participants' sleep patterns are recorded for one month prior to experiment.
 - C Wake-up alarms are selected by each participant.
 - D Population of participants is increased.
-

16. **CCGTAC**

What would the mRNA complement of the above DNA strand be?

- A** AATGCA
 - B** GGCAUG
 - C** TTACUT
 - D** UUACGU
-

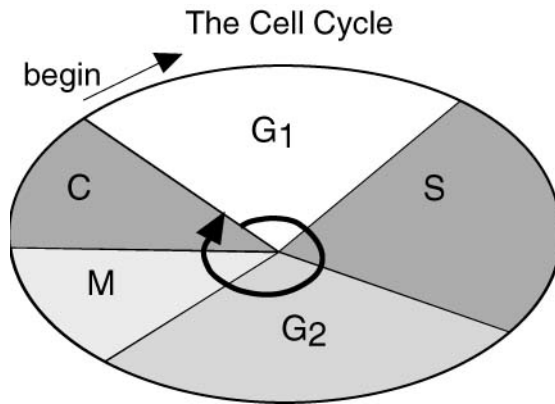
17. **Hibernation is a period of time during which an animal remains dormant. They do not eat during this time and their lack of activity conserves energy. Hibernation causes the animal's —**

- A** body temperature to rise.
 - B** heart rate to decrease.
 - C** fur to change color.
 - D** claws to get sharper.
-

18. **In an ecosystem, elements such as nitrogen and carbon move between living things and the environment. The conversions of these elements are part of —**

- A** biogeochemical cycles.
 - B** ecological succession.
 - C** energy pyramids.
 - D** symbiotic relationships.
-

19.



The stages of cell division called prophase, metaphase, anaphase, and telophase occur during which stage of the cell cycle shown in the diagram above?

- A G₁
 - B S
 - C M
 - D C
-

20. Enzymes can promote chemical reactions in living tissues. For example, the breakdown of hydrogen peroxide into harmless water and oxygen is accomplished by the chemical catalase. Which molecule represents the substrate in this reaction?

- A Catalase
 - B Hydrogen peroxide
 - C Oxygen
 - D Water
-

21. Which of these can NOT be viewed with a compound light microscope?

- A Cell wall
 - B Cheek cell
 - C DNA molecule
 - D Nucleus
-

- 22. Assume that brown eyes (B) are dominant over tan eyes (b) in guinea pigs. When a brown-eyed male is mated with a tan-eyed female, 50% of the litter has brown eyes and 50% has tan eyes. What is the genotype of the female guinea pig?**
- A BB
 - B Bb
 - C bB
 - D bb
-

- 23. Highly social species of organisms benefit from cooperative behavior in all of the following ways EXCEPT by improving —**
- A chances of surviving environmental disasters.
 - B opportunities for finding and obtaining food.
 - C modifications to the environment.
 - D defensive tactics against predators.
-

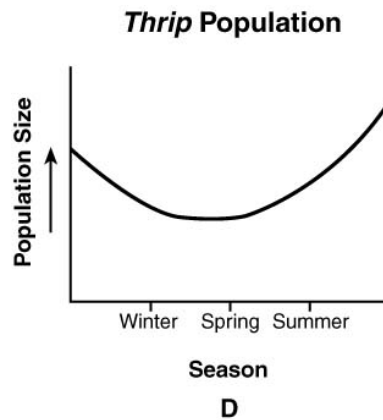
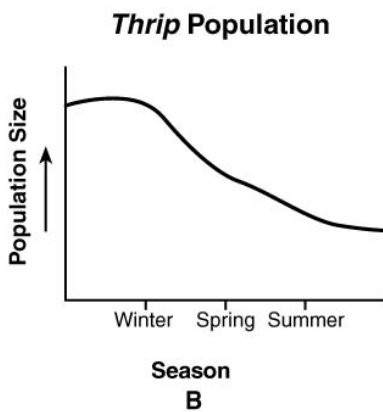
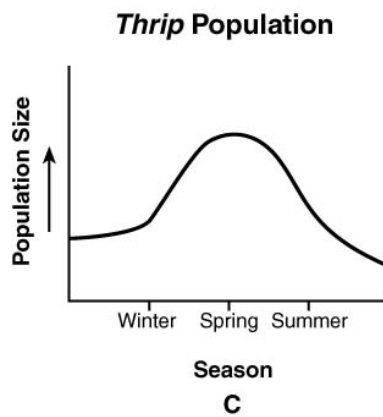
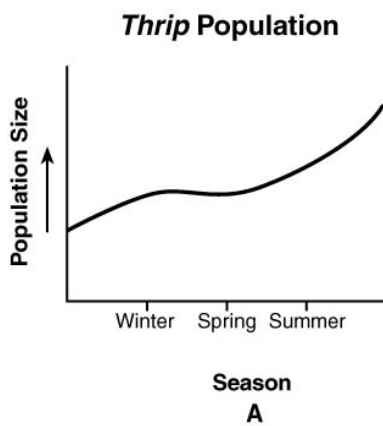
- 24. The FIRST evidence that nitrogen-fixing bacteria populations have become too low in a terrestrial biome would be a decline in the —**
- A producer populations.
 - B first-order producer populations.
 - C second-order consumer populations.
 - D decomposer populations.
-

- 25. The plasma membrane of a cell is selectively permeable, which means it—**
- A controls all cellular activities.
 - B is responsible for asexual reproduction.
 - C allows some materials to pass.
 - D has a carbohydrate foundation.
-

26. The molecules made by living cells are MAINLY assembled around which element?

- A Calcium
 - B Carbon
 - C Hydrogen
 - D Oxygen
-

27. The Australian insect pest *Thrips* feeds on the pollen and flower tissues of certain plants. Population size depends on the number of flowers available. Winters are too cool and summers are too dry for many flowers to bloom. Which of the following graphs MOST likely represents the changing *Thrips* population?



28. The phenotype of an animal depends MOST directly on —

- A how the genes of the animal are expressed.
 - B the metabolic rate of the animal.
 - C the source of the animal's food.
 - D how many cells are in the animal's body.
-

29. Most non-vascular plants are small because they —

- A can only transport water short distances.
 - B have thick leaves.
 - C usually grow in deserts.
 - D are unable to perform photosynthesis.
-

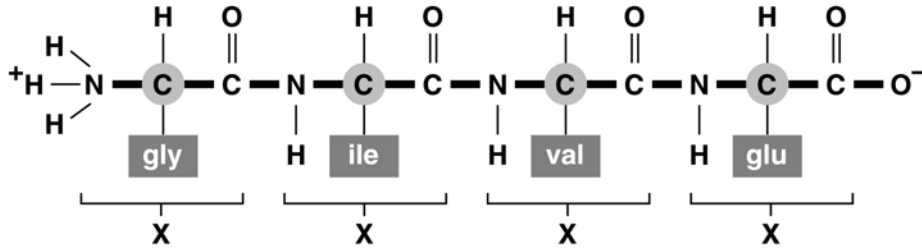
30. What kind of vegetation would dominate the landscape in a temperate region with little summer rain, but heavy winter rains and little snowfall?

- A Tree ferns
 - B Leafy grasses
 - C Woody shrubs
 - D Fast growing trees
-

31. A human red blood cell normally contains 0.9% salt. Which of the following solutions is hypotonic to red blood cells?

- A 0.1 %
 - B 0.9 %
 - C 1.0 %
 - D 1.9 %
-

32.



A diagram of a protein molecule is shown above. The units labeled "X" which bond together to form the protein molecule are called —

- A amino acids.
 - B fatty acids.
 - C monosaccharides.
 - D nucleotides.
-

33. When working in the laboratory, which one of the following actions does NOT represent safe and correct chemical handling?

- A Pouring chemical waste down the drain
 - B Cleaning up chemical spills immediately
 - C Washing hands after handling chemicals
 - D Keeping noxious or dangerous chemicals under fume hoods
-

34. In what part of DNA is genetic information located?

- A Hydrogen bonds
 - B Nucleotide sequence
 - C Sugar molecules
 - D Enzymes
-

35. Which of these groups is made up entirely of consumers?

- A Algae
 - B Plants
 - C Fungi
 - D Protists
-

36. A grassland biome does not naturally support trees because there is a —

- A lack of humus in the soil.
 - B lack of adequate precipitation.
 - C layer of permafrost which prevents trees from establishing roots.
 - D large number of predatory insects which destroy young trees.
-

37. Some ribosomes float freely in the cytoplasm, while others are attached to the —

- A Golgi bodies.
 - B endoplasmic reticulum.
 - C chromosomes
 - D nucleus.
-

38. Carbohydrate molecules have all of the following bonds EXCEPT —

- A C-C
 - B C-N
 - C C-H
 - D C-O
-

39.

Reaction Times to Grip a Falling Ruler

Subject	At room temp. (seconds)	After cooling (seconds)
1	4.3	4.9
2	3.7	4.2
3	3.6	4.8
4	4.4	5.9
5	4.5	4.8
Averages	4.1	4.9

The data shown above was collected during a reaction time experiment. Reaction times for each subject were taken first at room temperature and then after cooling each subject's hand in ice water for five minutes.

Which of the following statements is BEST supported by the data?

- A Cooling the hand increases the reaction time.
 - B Cooling the hand does not affect the reaction time.
 - C Cooling the hand affects only some subjects.
 - D One minute of cooling is not enough time to see differences in reaction time.
-

40. A karyotype would be LEAST useful in determining whether a person had —

- A a missing 23rd chromosome.
 - B more than one X chromosome.
 - C a recessive gene on the Y chromosome.
 - D an extra copy of chromosome 21.
-

41. Mushrooms and yeasts are examples of —

- A viruses.
 - B bacteria.
 - C fungi.
 - D protozoa.
-

42. The little brown bat has populations in the millions in some caves. These mammals consume insects that are harmful to corn and cotton. It is estimated that a community of a million bats consumes 10 tons of insects each night. As the population of bats increases, it would be expected that the crop production in nearby areas would —

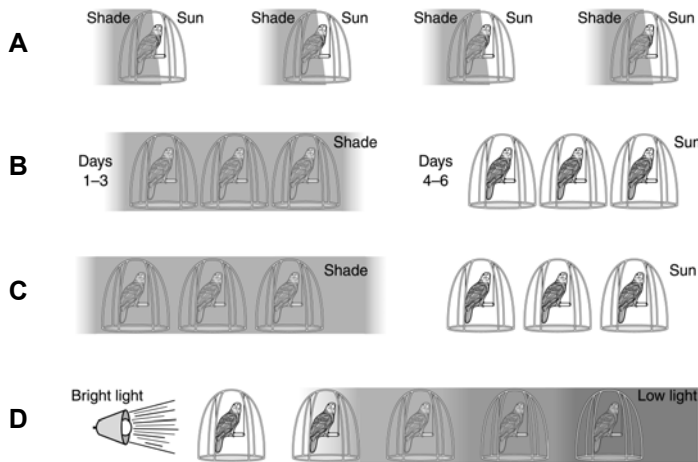
- A show a minimal response.
- B remain constant.
- C be cut in half.
- D steadily increase.

43. Which of the following processes is MOST responsible for getting genetic information to each cell in the body of an organism?

- A Protein synthesis
- B Mitosis
- C Diffusion
- D Respiration

44. A parrot is being kept in a cage in a shaded part of a room away from the window. It rarely talks or moves around its cage. The parrot is moved to a spot near a window where direct sunlight shines into its cage part of each day. The parrot begins to talk more and becomes more active.

Which setup below would BEST test the hypothesis that sunlight makes parrots more active?



45. **Watson and Crick's model of DNA resembles —**

- A interlocking gears.
 - B a boat on a calm lake.
 - C a twisted ladder.
 - D electrical wires.
-

46. **A terrestrial biome is to a tropical rain forest as an aquatic biome is to —**

- A a coral reef.
 - B a lake bottom.
 - C a river delta.
 - D an intertidal zone.
-

47.

Characteristics	Organism 1	Organism 2
Vertebral Column	No	No
Antennae	No	Yes
Body segments	2	3
Wings	No	Yes

1a. Vertebral column present – vertebrate

1b. Vertebral column absent go to (2)

2a. 3 or more body segments go to (3)

2b. 2 body segments go to (4)

3a. wings possible – insect

3b. no wings – millipede

4a. antennae absent – arachnid

4b. antennae present – crustacean

According to the table and dichotomous key shown above, which of the following conclusions can be drawn about the organisms?

- A Organism 2 is a millipede.
 - B Organism 1 is an arachnid.
 - C Organism 2 is a crustacean.
 - D Organism 1 is an insect.
-

48. What structures carry the MOST genetic information for a leaf cell?

- A Chromosomes
 - B Ribosomes
 - C Centrioles
 - D Chloroplasts
-

49. Which of these is different for all the groups being tested in an experiment?

- A Hypothesis
 - B Constant
 - C Control
 - D Variable
-

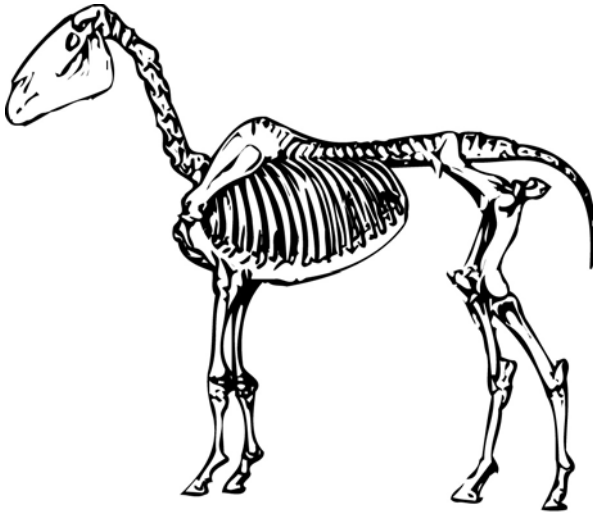
50. A gardener planted red flowering plants in a garden. He crossed the red flowers with white flowers, and the offspring flowers were pink. This is an example of —

- A incomplete dominance.
 - B sex linkage.
 - C multiple alleles.
 - D homozygous inheritance.
-

51. A cotton rag and a banana peel require about 6 months to decompose in a landfill. An aluminum can and a plastic bottle require up to 500 years to decompose in a landfill. What causes this difference in decomposition times?

- A Sunlight rapidly breaks down aluminum cans and plastic bottles.
 - B Rainfall causes cotton rags and banana peels to dissolve more slowly.
 - C Microorganisms slow down the decomposition of cotton rags and banana peels.
 - D Aluminum cans and plastic bottles are not easily broken down by microorganisms.
-

52.



The diagram above represents an organism belonging to the phylum —

- A Arthropoda.
 - B Chordata.
 - C Annelida.
 - D Protozoa.
-

53. The salivary glands of animals release secretions from simple proteins that are packaged in each cell's —

- A nucleus.
 - B lysosomes.
 - C endoplasmic reticulum.
 - D Golgi bodies.
-

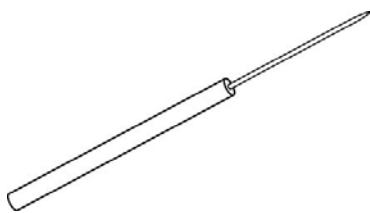
54. Which of the following is a lipid?

- A Cholesterol
 - B Cellulose
 - C Glucose
 - D Protein
-

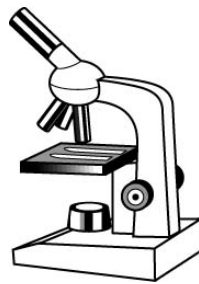
55. Which of the following biological classification groups has the MOST organisms?

- A Phylum
 - B Order
 - C Kingdom
 - D Class
-

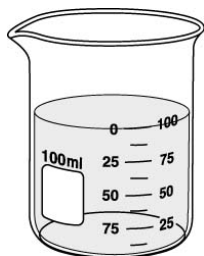
56. Which of these type of instruments was MOST important in discovering the nucleus of the cell?



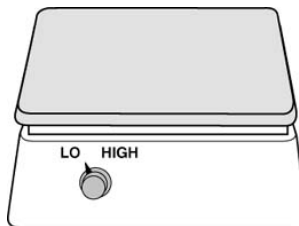
A



C



B



D

57. The number of chromosomes in the egg of a potato plant is 24. The number of chromosomes in the cells of the potato root is —

- A 12.
 - B 24.
 - C 36.
 - D 48.
-

58. One way RNA is different from DNA is that RNA contains —

- A phosphate groups.
 - B hydrogen bonds.
 - C ribose.
 - D bases.
-

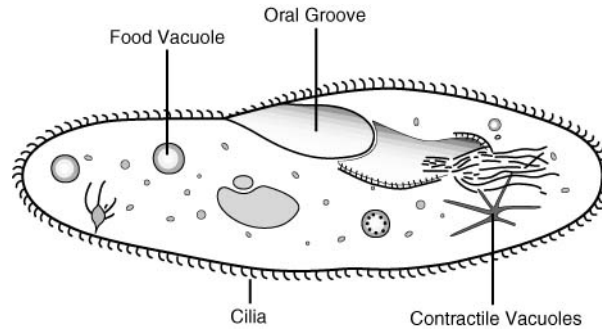
59. Reptile is to amphibian as lizard is to —

- A turtle.
 - B frog.
 - C alligator.
 - D snake.
-

60. Four microscope objectives and oculars are given below. Which of these combinations would provide the WIDEST field of view?

- A Objective 5x Ocular 20x
 - B Objective 10x Ocular 5x
 - C Objective 20x Ocular 10x
 - D Objective 40x Ocular 20x
-

61.



Which organelle below reduces the effects of osmosis in this type of protozoan?

- A Contractile vacuole
 - B Food vacuole
 - C Cilia
 - D Oral Groove
-

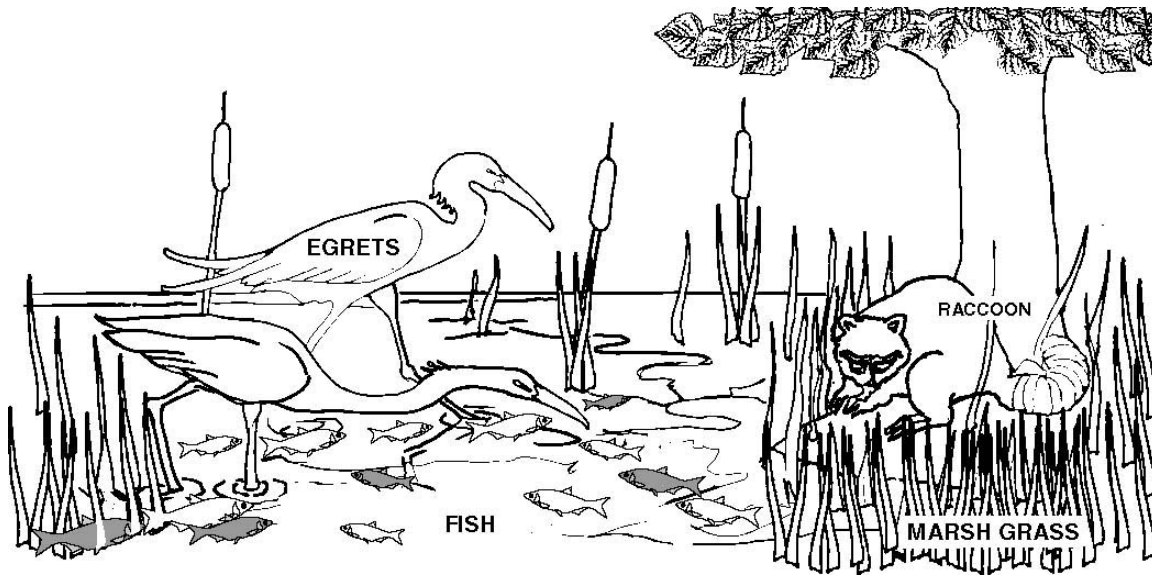
62. **Which of these biological classification groups has the fewest members?**

- A Class
 - B Genus
 - C Species
 - D Family
-

63. **Unlike mitosis, meiosis occurs only in —**

- A reproductive cells.
 - B muscle cells.
 - C connective tissue cells.
 - D nerve cells.
-

64.



Which of the following organisms in the pond scene shown above has the **GREATEST** biomass?

- A Raccoon
 - B Egrets
 - C Fish
 - D Marsh grass
-

65. To do an effective investigation of the damage caused by acid rain in a certain region, all of the following methods should be used **EXCEPT** —

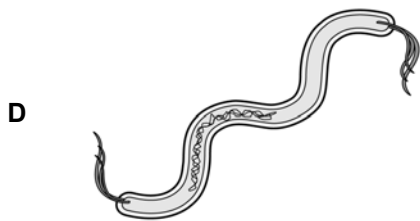
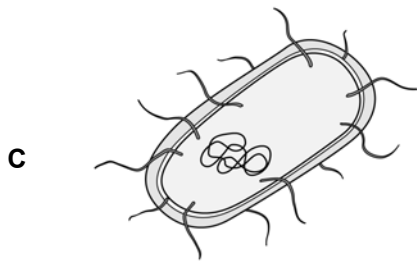
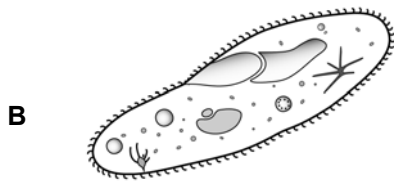
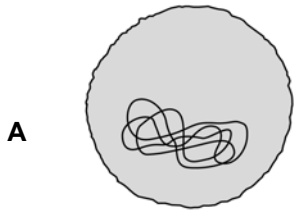
- A forming a hypothesis as to possible causes of acid rain in the region.
 - B conducting pH tests on bodies of water within the region and comparing acidity to normal rain water.
 - C investigating weather patterns to locate winds that might sweep pollutants into the region.
 - D keeping rainfall and temperature readings throughout the year to measure any increases in thermal heating.
-

66. In order for humans to have a normal number of chromosomes, sex cells must be —

- A haploid.
 - B diploid.
 - C triploid.
 - D tetraploid.
-

67. A student observed how many times bees visited each of four different colored roses. What would be the BEST way to visually communicate the results of these observations?
- A Pie chart
 - B Bar graph
 - C Line graph
 - D Brief narrative
-

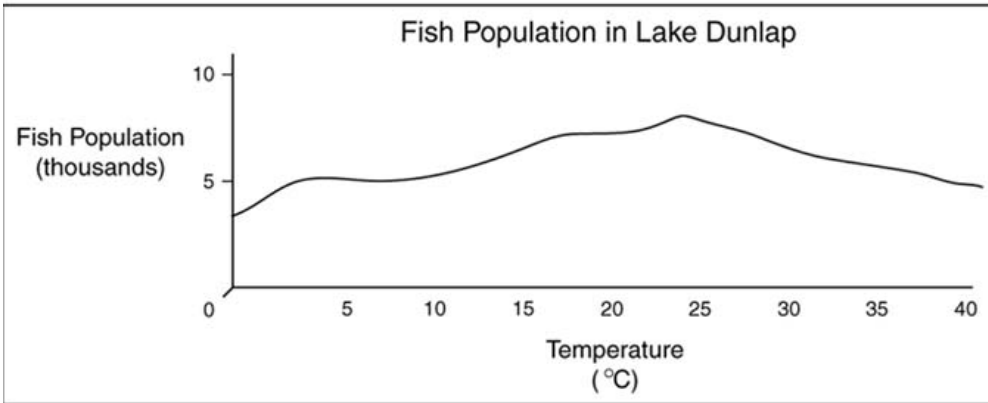
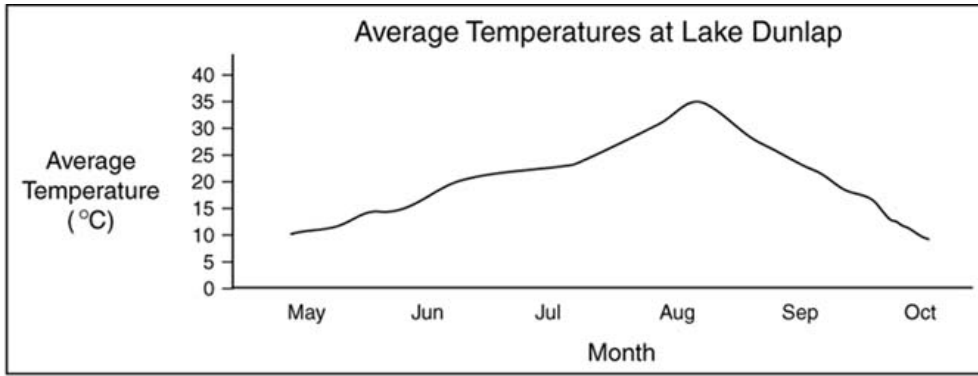
68. Which of the following organisms is a eukaryotic cell?



- 69.** A dominant gene that codes for white hair is represented by the symbol W. If a parent with the genotype WW is crossed with a parent of genotype Ww, what percent of their offspring will have white hair?
- A 25%
 - B 50%
 - C 75%
 - D 100%
-

- 70.** A certain species of bird eats insects off the backs of cattle. If the relationship between the birds and the cattle is mutualistic, then the individuals benefiting from the relationship are —
- A only the birds.
 - B only the cattle.
 - C neither the birds nor the cattle.
 - D both the birds and the cattle.
-

71.



According to the graph shown above, during which month would the bear population have the most fish available to eat?

- A May
 - B July
 - C August
 - D October
-

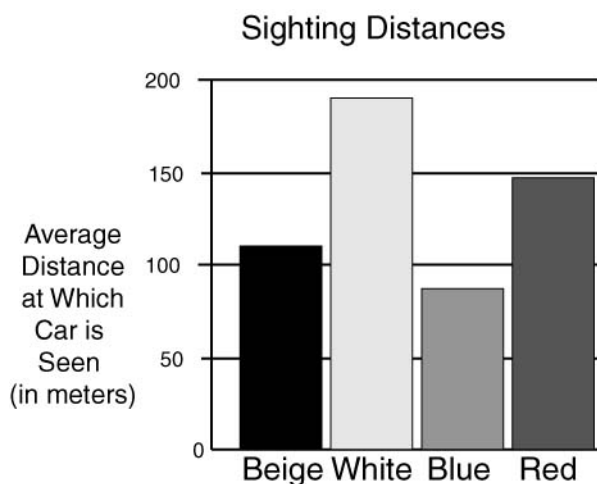
72. A virus can be classified by its type of —

- A mitochondria.
 - B nucleic acid.
 - C chromosomes.
 - D carbohydrates.
-

73. The channels in cell membranes that help substances to move in and out of cells during active transport are made of —

- A protein.
 - B chlorophyll.
 - C cytoplasm.
 - D carbohydrates.
-

74.



The graph above shows data from an experiment conducted to determine which car colors are most visible to oncoming drivers. Based on this graph, which car color would be the **MOST** visible to drivers of other cars?

- A Beige
 - B White
 - C Blue
 - D Red
-

75. A woman who is colorblind (X^cX^c) can expect —

- A 100% of her female offspring to be colorblind.
 - B 100% of her male offspring to be colorblind.
 - C 50% of her female offspring to be colorblind.
 - D 50% of her male offspring to be colorblind.
-

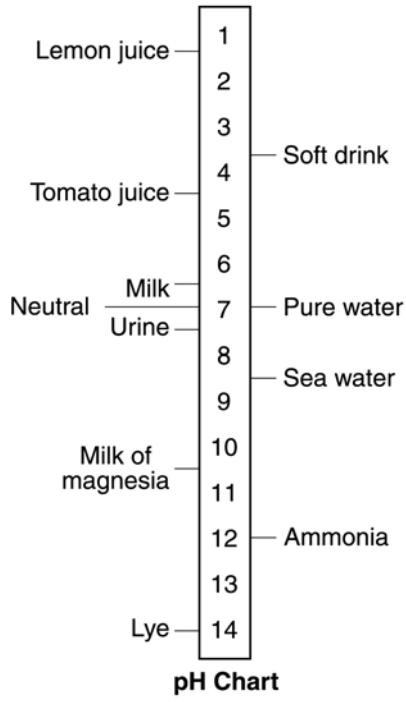
76. Which of these is an effective way to remove an air bubble from a microscope slide?

- A** Gently tapping on the coverslip
 - B** Adjusting the focus on the microscope
 - C** Cleaning the microscope lenses
 - D** Increasing the amount of light
-

77. Bacteria cells reproduce by binary fission, a type of asexual cell division. One advantage of binary fission is —

- A** greater genetic variation in daughter cells.
 - B** the ability to reproduce quickly.
 - C** greater resistance to disease.
 - D** the ability to live under anaerobic conditions.
-

78.



On the pH scale above, which of these is the stronger acid?

- A Milk
- B Urine
- C Soft drink
- D Tomato juice

79. In some years the number of minnows in a pond is much greater than in other years. The increases in the minnow population are MOST likely accounted for by increases in —

- A predators.
 - B pond silt.
 - C death rates.
 - D pond vegetation.
-

80. Which of the following would be BEST to use to help determine any taxonomic relationship between two organisms that have similar appearance and are found within a similar environment?

- A A color vision test to determine if both organisms can see in color
 - B Gel electrophoresis to compare DNA banding patterns
 - C Eukaryotic cell comparison to determine if both are animals
 - D A cilia test to determine if both have the nine-plus-two arrangement
-

81. The difference between an experimental group and a control group is that the —

- A experimental group has a known outcome.
 - B experimental group contains the variable being tested.
 - C control group contains no variables being tested.
 - D control group is needed only when testing more than one variable.
-

82. Chromosomes are most easily seen during cell division because the chromosomes —

- A double in number.
 - B shorten and thicken.
 - C move and expand.
 - D match up with other chromosomes.
-

83. Energy stored in food is released when —

- A chemical bonds are broken.
 - B atomic nuclei are split.
 - C elements combine.
 - D electrons are produced.
-

84. Animals that have thick fur and are able to store large amounts of fat MOST likely live in a —

- A** savannah or tundra.
 - B** rainforest or temperate forest.
 - C** coniferous forest or tundra.
 - D** savannah or temperate forest.
-

85. In people, the trait for colorblindness (X^b) is a recessive sex linked trait and normal vision (X^B) is dominant. If a female who is heterozygous for colorblindness has children with a man who has normal vision, what percent of their male children would be expected to be color blind?

- A** 0%
 - B** 25%
 - C** 50%
 - D** 100%
-

- 86. Protective equipment can be defined as items used or worn by someone in a laboratory to ensure his or her safety. These items protect people from dangers such as chemicals, sharp objects, and infections. Give at least three examples of protective equipment and explain what each is used for.**

- 87. A new species has been introduced into an ecosystem. This new species has no predators and an unlimited food supply. Explain at least two ways the introduction of this new species would alter the existing environment of that ecosystem.**