

Student Name _____

Form 401

Georgia



End-



Of-



Course

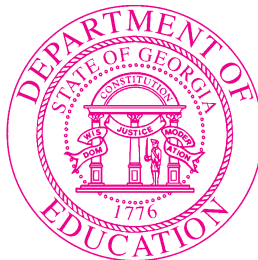


Tests

Biology

Released Test Booklet

Spring 2004



Georgia Department of Education
Kathy Cox, State Superintendent of Schools
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SECTION I

Directions:

Today you will be taking the Biology End-of-Course Test. Read each question carefully and then choose the *best* answer.

Be sure that the question number on the answer sheet matches the number on the test. Then mark your answer by filling in the circle on your answer sheet. Do not write your answers in the test booklet. If you do not know the answer to a question, skip it and go on. You may return to it later if time permits.

If you need to change an answer on your answer sheet, be sure to erase your first mark completely. Do not make any stray marks on the answer sheet.

If you finish the section of the test early, you may review your answers in that section only. You may not go on to the next section or return to a previous section.

The two practice test questions below are provided to show you what the questions in the test are like. For each question, you should choose the one *best* answer and fill in the circle in the space provided on your answer sheet.

Practice Items:

P1 Which human body system is responsible for transporting oxygen throughout the body?

- A the digestive system
- B the excretory system
- C the circulatory system
- D the respiratory system

P2 While reading a nature magazine, Sheila learned that spadefoot toads are common in areas with high daytime temperatures, limited rainfall, and cacti as the primary vegetation. Which biome would spadefoot toads MOST likely inhabit?

- A desert
- B grassland
- C tropical forest
- D temperate forest



BIOLOGY

1 Which of the following organisms is used to help in the production of bread?

- A mold
- B bacterium
- C yeast
- D lichen

2 Which occurrence is a major source of the gases that can produce acid rain?

- A a hole in the ozone layer
- B burning of fossil fuels
- C cloud-seeding by airplanes
- D emissions by nuclear reactors

3 Which of the following is the smallest unit as shown on the metric ruler below?



- A centimeter
- B kilometer
- C millimeter
- D hectometer

4 Cells use passive and active transport to move materials across cell membranes in order to maintain a constant internal environment. What is the process of maintaining a constant internal environment called?

- A diffusion
- B evolution
- C homeostasis
- D respiration

5 How many chromosomes are contained in a human male gamete cell?

- A 11
- B 23
- C 34
- D 46

6 Which of these is a beneficial effect of monerans?

- A the breakdown of cellulose
- B survival in hot, acidic environments
- C production of billions of offspring per day
- D conjugation as a means of sexual reproduction

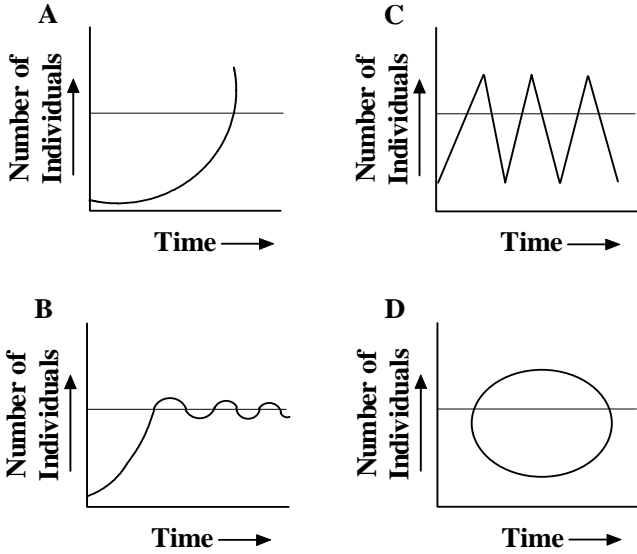
7 Which of the following is an abiotic factor in an ecosystem?

- A grass
- B a fox
- C a rock
- D a worm

8 In a scientific experiment, how many independent variables should be tested at the same time?

- A none
- B one
- C two
- D three or more

9 An undisturbed deer population grows until its carrying capacity is reached. Which of the graphs below BEST resembles this deer population?

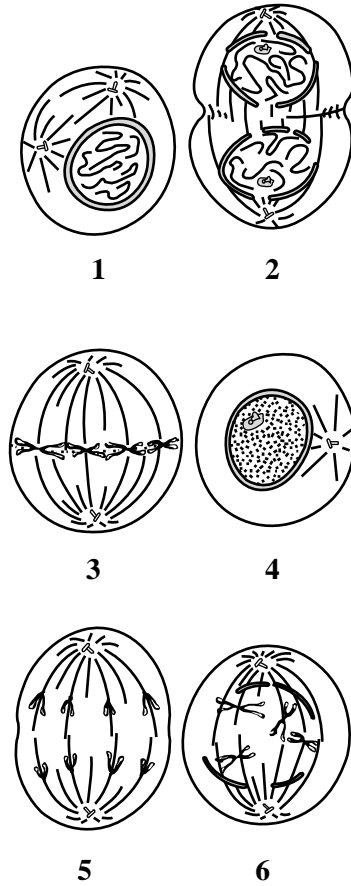


10 Of the following, which is considered a living organism?

- A bacterium
- B mitochondrion
- C nucleus
- D sperm

11 Which of the following correctly lists the phases of the cell cycle starting with the interphase?

Phases of the Cell Division Cycle



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

12 Which chamber of the heart pumps blood to the lungs?

- A left atrium
- B left ventricle
- C right atrium
- D right ventricle

13 Which of the following examples illustrates osmosis?

- A Water leaves the tubules of the kidney in response to the hypertonic fluid surrounding the tubules.
- B Digestive enzymes are excreted into the small intestine.
- C White blood cells consume pathogens and cell debris at the site of an infection.
- D Calcium is pumped inside a muscle cell after the muscle completes its contraction.

14 Based on the summary equation for photosynthesis shown below, which of the following is produced by the reaction?



- A CO_2
- B H_2O
- C light
- D $\text{C}_6\text{H}_{12}\text{O}_6$

15 The observed trait that appears in an organism as a result of its genetic makeup is called the organism's

- A allele
- B genotype
- C phenotype
- D karyotype

16 Why is it important for the cells of multicellular organisms to undergo mitosis?

- A Mitosis allows for reproduction with male and female gametes.
- B Mitosis increases variation within an organism.
- C Mitosis produces cells that are different from the original dividing cell.
- D Mitosis produces identical cells to the original dividing cell.

17 A cell whose function is to relay information obtained from the environment to the brain is called a

- A neuron
- B chondrocyte
- C fibroblast
- D macrophage

18 Which of the following "organisms" is considered to be an exception to the cell theory?

- A bacteria
- B viruses
- C amoeba
- D yeast

19 Adam experiments with anole lizards that can change color, depending on their environment. Adam places a green anole lizard on a brown background and a brown anole lizard on a green background. Adam knows that the brown lizard should turn green and the green lizard should turn brown, but neither of the lizards changed color. What may have caused Adam's results?

- A Their color changing may be affected by something else besides the background color, such as fear or temperature.
- B They may have to move to the new background on their own rather than being placed there.
- C They may need more time in which to change color.
- D The colors of the background may not have been appropriate for these lizards.

BIOLOGY

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22 FIELD TEST ITEM

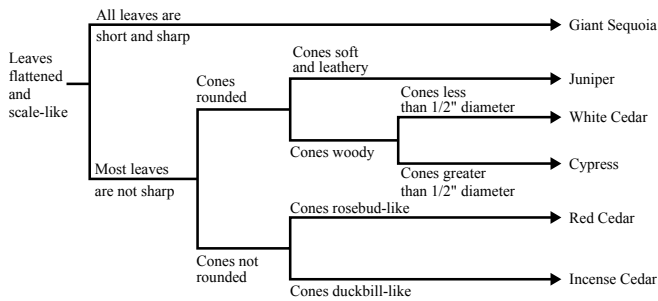
21 FIELD TEST ITEM

23 FIELD TEST ITEM

24 A researcher could BEST monitor a person's rate of respiration by measuring which of the following characteristics?

- A oxygen consumption
- B body temperature
- C heart rate
- D lung capacity

25 Look at the dichotomous key given below.



A tree with scale-like leaves and rounded, woody cones greater than $\frac{1}{2}$ " in diameter would be identified as which of the following?

- A Giant Sequoia
- B Cypress
- C Juniper
- D Red Cedar

26 When a virus infects a bacterium, what does the virus inject into the cell?

- A viral nucleic acid
- B capsid proteins
- C hormones
- D tail fibers

27 Unlike prokaryotic cells, eukaryotic cells have the capacity to

- A assemble into multicellular organisms
- B establish symbiotic relationships with other organisms
- C obtain energy from the Sun
- D store genetic information in the form of DNA

28 A student named Lu is about to leave the lab area where she has been working with chemicals. What is the last activity she should perform before she leaves the lab area?

- A put away her equipment
- B wash her hands
- C wash the tabletop
- D clean the glassware

29 Which protist causes malaria?

- A amoeba
- B euglena
- C paramecium
- D plasmodium

30 In glycolysis, the first stage of cellular respiration, ATP molecules are produced. What is the net gain of ATP molecules (per molecule of glucose) from glycolysis?

- A 1
- B 2
- C 4
- D 36

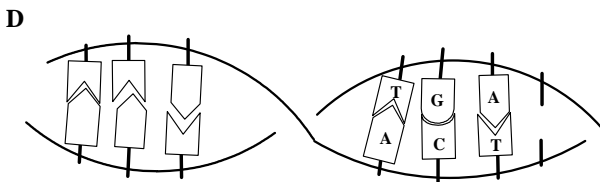
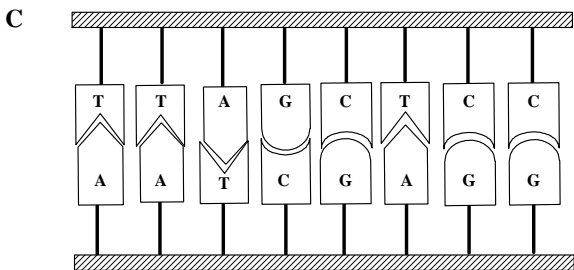
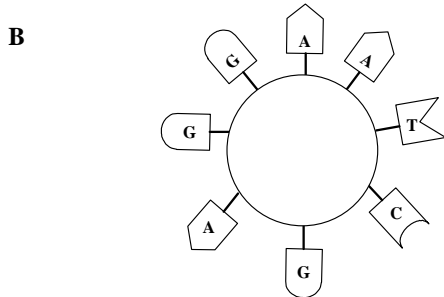
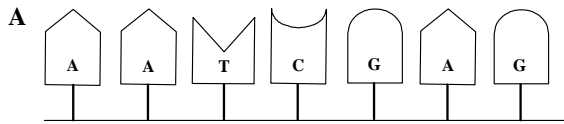
31 If placed in a hypertonic solution, a plant cell will

- A swell
- B burst
- C shrink in size
- D remain constant in size

32 Which of the following correctly identifies the dominant stage in the fern life cycle represented by the frond?

- A It is a parasite.
- B It is the sporophyte stage.
- C It is made of haploid cells.
- D It is the gametophyte stage.

33 Which of the following correctly shows the shape of a DNA molecule?



34 Which of the following fields of biology focuses on the interactions among various species with each other and their environment?

- A anatomy
- B genetics
- C biochemistry
- D ecology

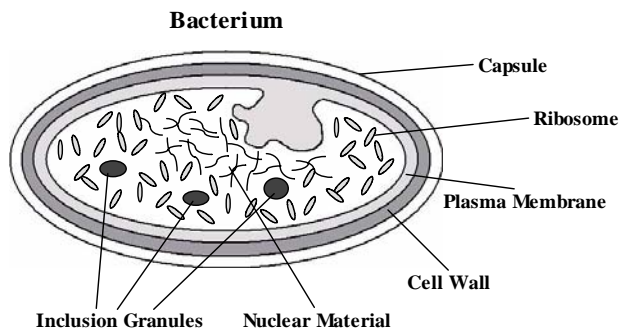
35 A gene that is sex-linked is BEST described as which of the following?

- A It results in all male offspring.
- B It results in all female offspring.
- C It is located on the X chromosome.
- D It is located inside the mitochondria.

36 A terrestrial animal that must go back to a water environment in order to reproduce is MOST likely to belong to which of the following classes of vertebrates?

- A Amphibia
- B Aves
- C Mammalia
- D Reptilia

37 As represented in the diagram below, bacteria have cell walls like plant cells do.



Unlike the plant cell walls, however, the bacterial cell wall is made of which of the following?

- A cellulose and starches
- B chitin and fats
- C sugars and amino acids
- D cellulose and sugars

38 A type of cell that can exist in a broad range of environmental conditions, can rapidly multiply, and lacks a nucleus is known as what type of cell?

- A animal
- B eukaryotic
- C plant
- D prokaryotic

39 Some viral diseases require only one vaccination, which lasts for years. For other diseases like the flu, vaccinations last only one season. The flu vaccine lasts such a short time because the flu virus

- A is more easily transmitted
- B mutates much more rapidly
- C is less dangerous
- D is much smaller

40 Which of the following practices is MOST likely to slow the buildup of CO₂ in the atmosphere?

- A increased use of tropical rain forest areas for agriculture
- B increased use of genetically engineered plants
- C decreased pesticide use in favor of biological controls
- D decreased use of fossil fuels

41 FIELD TEST ITEM

42 FIELD TEST ITEM

43 FIELD TEST ITEM

44 FIELD TEST ITEM

45 FIELD TEST ITEM



STOP WORK

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SECTION II

Do not turn page until instructed to do so.

46 Sea turtles are classified as vertebrates because they have

- A a backbone
- B two germ layers
- C radial symmetry
- D a brain

47 The process by which the order of bases in messenger RNA (mRNA) codes for the order of amino acids in a protein is called

- A translation
- B transcription
- C replication
- D nondisjunction

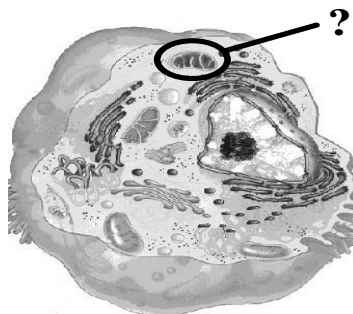
48 Predators often feed on weak or sick animals in an ecosystem. The role of the predator is described as its

- A community
- B habitat
- C niche
- D population

49 Sodium chloride (table salt) is an example of which of the following?

- A an element
- B a radioactive isotope
- C a chemical compound
- D a chemical formula

50 The function of the cell organelle circled below is to produce energy.



What is the name of this organelle?

- A Golgi apparatus
- B mitochondrion
- C nucleus
- D ribosome

51 Athletes are often concerned with the question of how much protein they need in their diets because of the requirement of growing muscles for protein. Just as muscles need the basic building block of protein, protein itself has basic building blocks also. Which of the following are the basic building blocks of protein?

- A nitrates
- B amino acids
- C monosaccharides
- D nucleotides

52 Members of which of the following groups of organisms have an internal skeleton?

- A mollusks
- B jellyfish
- C insects
- D fish

53 The genetic disorder trisomy 21 (Down syndrome) is caused by what genetic event?

- A crossing-over
- B nondisjunction
- C base pair substitution
- D frame-shift location

54 Pea plants have seeds that are either round or wrinkled. In this cross, what will be the phenotypic ratio of the offspring?

Punnett Square

	R	R
R		
r		

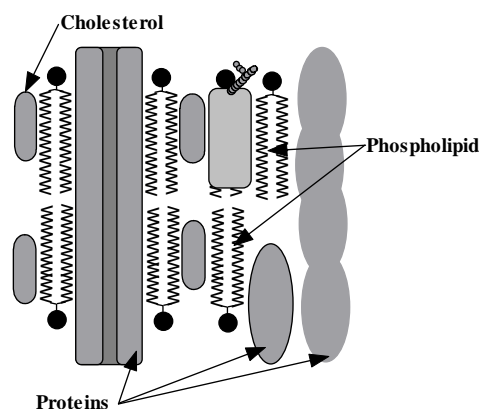
R = Round Seeds
r = Wrinkled Seeds

- A 50% *RR* and 50% *Rr*
- B 25% *RR*, 50% *Rr*, and 25% *rr*
- C 50% round seeds and 50% wrinkled seeds
- D 100% round seeds

55 Which of these can help farmers counteract the negative effects on their soil?

- A contour planting
- B insect predators
- C large-scale irrigation
- D expensive fertilizers

56 The drawing below illustrates a small portion of the molecules that make up a cell membrane.



The phospholipid molecules serve to

- A help cells recognize each other
- B allow glucose molecules into the cell
- C prevent the passage of certain molecules into the cell
- D line up amino acids for protein synthesis

57 A hard, protective exoskeleton is a key characteristic shared by all members of which of the following invertebrate phyla?

- A Arthropoda
- B Nematoda
- C Peripheral
- D Platyhelminthes

58 Organisms in an ecosystem are linked together by

- A geochemical pathways
- B greenhouse effects
- C food webs
- D water cycles

59 Lyme disease can be transmitted from ticks by a spirochete called *Borrelia burgdorferi*, causing a rash followed by flu-like symptoms. Which of the following approaches is MOST effective in the treatment of Lyme disease?

- A herbicides that destroy the grass where ticks live
- B pesticides that destroy the ticks that are infected
- C vaccinations in people that already have the disease
- D antibiotics to destroy the bacteria that cause the disease

60 FIELD TEST ITEM

61 FIELD TEST ITEM

62 Biology is the study of

- A science
- B molecules
- C life
- D animals

63 Which of the following shows how information is transformed to make a protein?

- A DNA → RNA → protein
- B gene → chromosome → protein
- C cell respiration → ATP → protein
- D ATP → amino acid → protein

64 Homeostasis is the maintenance of stable conditions within the body. Which of the following is a method of maintaining homeostasis in the human body?

- A working in air conditioning
- B shivering when cold
- C eating balanced meals
- D sleeping regularly

65 Humans have had a tremendous impact on the environment. What has caused an increase in the amount of acid rain?

- A use of chlorofluorocarbons
- B use of pesticides
- C coal burning power plants
- D nuclear power plants

66 Members of which of the following phyla have the MOST species which are parasites of humans?

- A Porifera
- B Mollusca
- C Echinodermata
- D Platyhelminthes

67 The gene for red/green colorblindness in humans is recessive and primarily affects males. It must be located on

- A the X chromosome
- B the Y chromosome
- C both the X and Y chromosomes
- D either the X or Y chromosome

68 The shaded portion of the map below, which includes the state of Georgia, would BEST be described as belonging to which biome?



- A temperate grassland
- B temperate deciduous forest
- C tropical forest
- D chapparal

69 Water (H₂O) is an example of a molecule whose atoms are held together by which of the following?

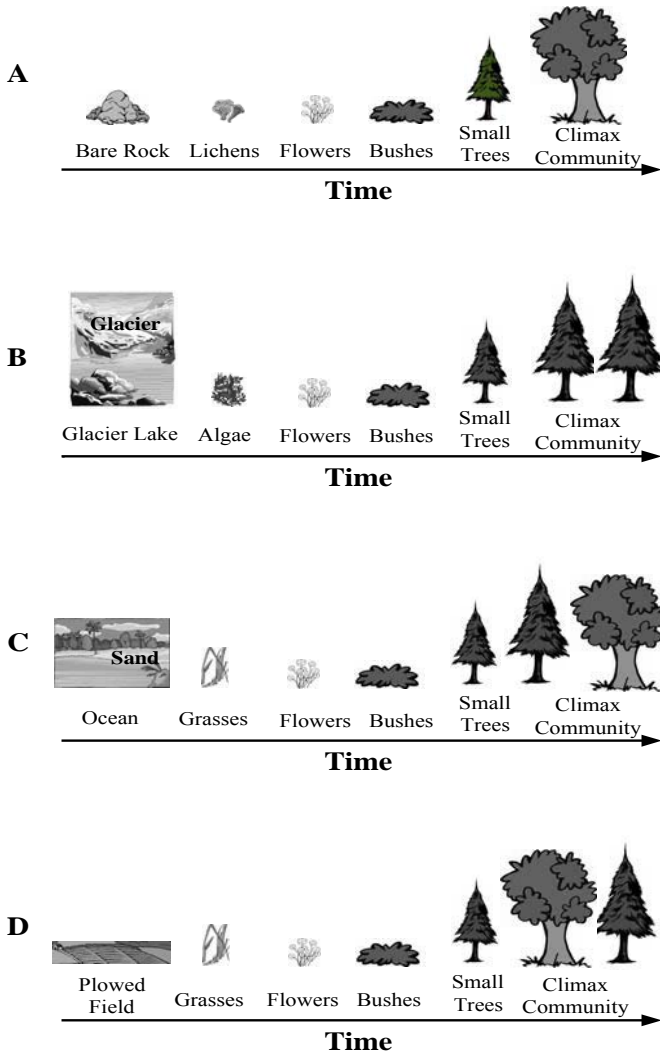
- A covalent bonds
- B ionic bonds
- C metallic bonds
- D hydrogen bonds

70 Which kingdom has representatives with the following characteristics?

Cell Type	eukaryotic
Body Plan	multicellular
Organ Systems	present
Method of Acquiring Food	photosynthesis

- A Fungi
- B Plantae
- C Protista
- D Animalia

71 Which of the diagrams below shows an example of secondary succession in an ecosystem?



72 What is the diploid chromosome number in a human body cell?

- A 23
- B 32
- C 44
- D 46

73 A.I. Oparin and J.B.S. Haldane each suggested that Earth's oceans once contained large amounts of organic molecules that eventually gave rise to pre-cells. What is Oparin and Haldane's idea historically known as?

- A big bang theory
- B cell theory
- C primordial soup model
- D evolutionary model

74 Fungi have filamentous bodies, are heterotrophic, and have cell walls that contain chitin. Which of these are examples of fungi?

- A bacteria
- B molds
- C algae
- D amoebas

75 Which of the following is an example of micro-evolution in organisms?

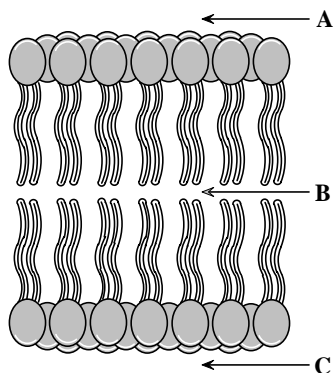
- A speciation
- B bio-magnification
- C habitat selection
- D pesticide resistance

76 Algae are commonly found in both fresh and saltwater. Under certain conditions, they may undergo population explosions. When this happens with one particular type of algae, it causes a red tide. Because of the toxins produced and released by these single-celled algae, many fishes are killed. Which of the following organisms is responsible for red tides?

- A zooplankton
- B dinoflagellates
- C green algae
- D brown algae

- 77** To observe a skin cell through a microscope at its highest magnification, you should first
- A use the coarse adjustment and the lowest power lens to focus and then switch to the highest power lens
 - B use the highest magnification and the fine adjustment until the object is in focus
 - C use the fine adjustment and lowest power lens to focus the object and then switch to the highest power lens
 - D use the highest power and the coarse adjustment until the object is in focus
- 78** The MOST nutritious part of grains such as rice and wheat is the
- A endosperm
 - B flower
 - C stamen
 - D embryo
- 79** The major source of the oxygen that is released into the atmosphere is
- A cellular respiration
 - B photosynthesis
 - C automobile exhaust
 - D the weathering of rocks
- 80** In humans, which body system has the primary role of detecting and responding to stimuli?
- A muscular
 - B nervous
 - C respiratory
 - D skeletal
- 81** What part of a plant functions as an anchor and as an absorption and storage unit?
- A flower
 - B leaf
 - C root
 - D stem
- 82** The biome populated by cone-bearing trees such as pine, spruce, and fir is the
- A deciduous forest
 - B coniferous forest
 - C savanna
 - D tundra
- 83** The body temperatures of warm-blooded creatures, such as birds and mammals, are kept fairly constant by automatic responses controlled by which of the following?
- A hypothalamus of their brains
 - B size of their hearts
 - C covering of their bodies
 - D amount of skeletal muscle

- 84** As illustrated below, the molecules of many membranes are arranged with their polar heads to the outside and their nonpolar tails to the inside.



With this arrangement, where would you MOST likely find water molecules?

- A A only
 - B B only
 - C C only
 - D A and C
- 85** To identify an unfamiliar species of bird, it is MOST useful to refer to which of the following resources?
- A biology textbook
 - B field guide
 - C genetics textbook
 - D web site about breeding exotic birds

86 FIELD TEST ITEM

87 FIELD TEST ITEM

88 FIELD TEST ITEM

89 FIELD TEST ITEM

90 FIELD TEST ITEM

