

FLORIDA END-OF-COURSE TEST**BIOLOGY**

- 1** The table below shows the classification of five different animals.

Classification Level	Aardwolf	Gray Wolf	Coyote	Lion	Blue Whale
<i>Kingdom</i>	Animalia	Animalia	Animalia	Animalia	Animalia
<i>Phylum</i>	Chordata	Chordata	Chordata	Chordata	Chordata
<i>Class</i>	Mammalia	Mammalia	Mammalia	Mammalia	Mammalia
<i>Order</i>	Carnivora	Carnivora	Carnivora	Carnivora	Cetacea
<i>Family</i>	Hyaenidae	Canidae	Canidae	Felidae	Balenopteridae
<i>Genus</i>	Proteles	Canis	Canis	Panthera	Balaenoptera
<i>Species</i>	Proteles cristatus	Canis lupus	Canis latrans	Panthera pantheraleo	Balaenoptera musculus

Which two organisms would you expect to have the most similar DNA sequences?

- A. aardwolf and grey wolf
- B. grey wolf and coyote
- C. coyote and lion
- D. lion and blue whale

- 2** Which kingdoms contain only unicellular organisms?

- F. Archaeobacteria and Protista
- G. Archaeobacteria and Eubacteria
- H. Eubacteria and Protista
- I. Eubacteria and Fungi

- 3** Robert Hooke was the first to describe cells in plants. What invention allowed Hooke and later scientists to develop the cell theory?



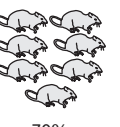





- A. light microscope
- B. genetic engineering
- C. X-ray crystallography
- D. 3-D computer imaging

- 4** How are regeneration and budding similar?

- F. They are both a result of mitosis.
- G. They are both a result of meiosis.
- H. They are both a result of apoptosis.
- I. They are both a result of crossing-over.

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- 5** A dark fur mutation occurred in a mouse population. The chart below shows how the population changed over 30 generations.

Initial Population	Generation 10	Generation 20	Generation 30
 90%	 80%	 70%	 40%
 10%	 20%	 30%	 60%

Which statement **most likely** explains the change shown in the chart?

- A. Light mice are less likely to mate.
 - B. Light mice are better able to find food.
 - C. Dark mice are harder for predators to see.
 - D. Dark mice are more susceptible to disease.
- 6** Which of the following is true about the functions of rough endoplasmic reticulum (rough ER) and smooth endoplasmic reticulum (smooth ER)?
- F. Although both are sites of cell membrane lipid assembly, proteins are assembled and packaged only in rough ER.
 - G. Neither kind of ER is a site of cell membrane lipid assembly but both are sites of protein assembly.
 - H. Enzymes within rough ER detoxify drugs and assemble proteins while smooth ER only assembles cell membrane lipids.
 - I. All protein assembly occurs in rough ER, and all cell membrane lipid assembly occurs in smooth ER.
- 7** In photosynthesis, plants use carbon (C), hydrogen (H), and oxygen (O) to form organic compounds. In what form do plants use these elements?
- A. glucose ($C_6H_{12}O_6$)
 - B. carbon dioxide (CO_2) and water (H_2O)
 - C. carbon monoxide (CO)
 - D. elemental forms (C, H, and O)

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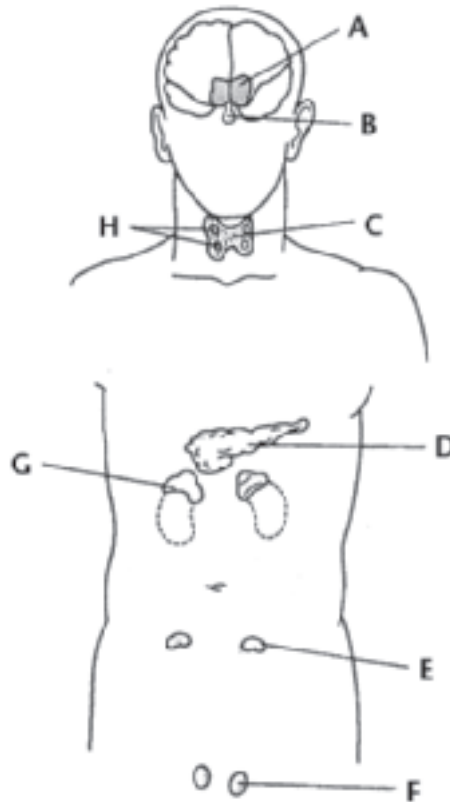
- 8** Which of the following describes the water in an estuary?
- F. salt water only
 - G. salt water in warmer months and fresh water in cooler months
 - H. fresh water only
 - I. a mixture of fresh water and salt water
- 9** What is the function of ATP in living things?
- A. ATP aids in protein folding and coiling.
 - B. ATP identifies DNA start sequences in preparation for transcription.
 - C. ATP is used to capture and transfer chemical energy.
 - D. ATP helps maintain the fluidity of cell membranes.
- 10** Which of the following is **not** an example of a successful national policy or international cooperation on environmental problems?
- F. a ban on CFCs, resulting in the reduction of the size of the ozone hole
 - G. a reduction in greenhouse gases, resulting in the complete reversal of the effects of global warming
 - H. a ban on lead in gasoline, resulting in dropping lead levels in the environment
 - I. a ban on DDT, resulting in the recovery of many top-level predatory birds
- 11** Which of the following is true of plant cells, but not of bacterial cells?
- A. have cell walls
 - B. do not undergo mitosis
 - C. move by means of flagella
 - D. have chromosomes located in a nucleus
- 12** Drawing on Mendel's principle of independent assortment, Thomas Hunt Morgan found that genes located on the same chromosome sort together. What is this principle called?
- F. codominance
 - G. incomplete dominance
 - H. crossing over
 - I. linkage

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- 13** The diagram below shows the glands of the endocrine system.

The Endocrine System



Which letter labels the gland that produces nine major hormones and controls the release of hormones by several other endocrine glands?

- A. H
 - B. B
 - C. G
 - D. D
- 14** What causes blood pressure?
- F. cholesterol in the blood
 - G. stress that exercise puts on heart muscle
 - H. contraction of the ventricles in the heart
 - I. removal of oxygen from blood

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- 15** What is the major function of meiosis?
- A. to produce haploid (1N) gametes
 - B. to produce diploid (2N) gametes
 - C. to produce haploid (1N) zygotes
 - D. to produce diploid (2N) zygotes
- 16** The Punnett square below shows the results of a cross to produce F₂ generation plants.

F₂ generation

	<i>W</i>	<i>w</i>
<i>W</i>	<i>WW</i>	<i>Ww</i>
<i>w</i>	<i>Ww</i>	<i>ww</i>

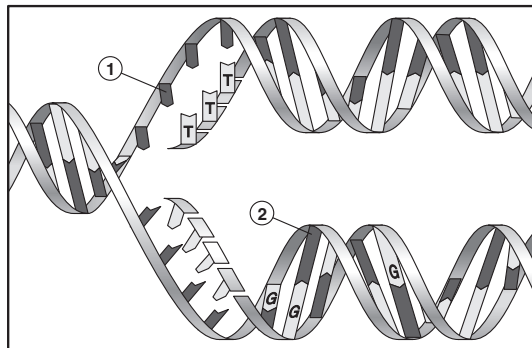
W = white flowers *w* = purple flowers

In the F₂ generation, what percent of the offspring have white flowers?

- 17** Which of the following does not prevent pathogens from entering the human body?
- F. red blood cells
 - G. tears
 - H. mucus
 - I. skin

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- 18** A company sells a drug for treating pain. A group of consumers claims that the drug causes side effects. The company pays scientists to study the group's claims. How can the scientists best reduce the chance for bias in their results?
- A. Present their results only to the company that hired them.
 - B. Report only the data that are most favorable to the company.
 - C. Talk to a small sample of people who claim to have had side effects.
 - D. Ask other scientists to perform independent experiments on the drug.
- 19** A mutation in which of the following would result in offspring with a phenotype **different** from the parents?
- F. skin cell
 - G. nerve cell
 - H. egg cell
 - I. heart cell
- 20** In what way are electron microscopes **different** from light microscopes?
- A. Electron microscopes use beams of electrons instead of light.
 - B. Electron microscopes use infrared light instead of UV light.
 - C. Electron microscopes use magnetic fields instead of light.
 - D. Electron microscopes use UV light instead of magnetic fields.
- 21** The diagram below shows a process that occurs in DNA.



What process is shown in this diagram?

- F. DNA translation
- G. DNA transcription
- H. DNA replication
- I. DNA degradation

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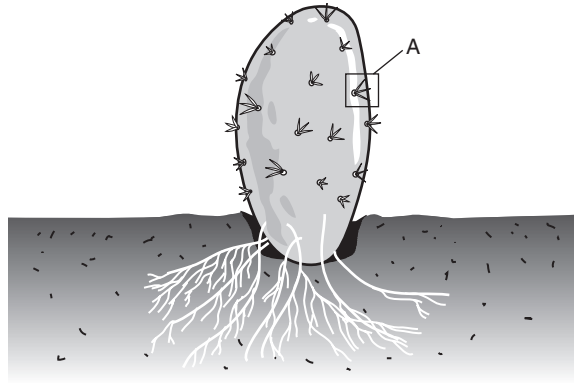
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- 22** What is the difference between modern methods of classification and traditional methods of classification?
- A. Modern classification is based on the phenotypic similarities of organisms while traditional classification is not.
 - B. Modern classification is based on evolutionary relationships between organisms while traditional classification is not.
 - C. Traditional classification methods are the foundation on which modern classification is built.
 - D. Traditional classification is based on shared-derived characteristics while modern classification is not.
- 23** In eukaryotic cells that are making proteins, translation refers to what part of the protein synthesis process?
- F. making messenger RNA from the DNA molecule in the nucleus
 - G. removing introns from the messenger RNA and splicing exons together
 - H. moving messenger RNA molecules from the nucleus to the cytoplasm
 - I. joining amino acids together at the ribosome according to messenger RNA instructions
- 24** What is the **most likely** reason that teachers now encourage their students to sneeze or cough into the area near their elbow instead of their hands to prevent transmission of a pathogen from one student to another?
- A. Washing your hands has been proven ineffective in preventing disease transmission.
 - B. People are less likely to come in direct physical contact with the elbow region than with the hands of an infected person.
 - C. The sleeve of the shirt will contain the pathogen and keep it from spreading.
 - D. The elbow contains specialized pathogen fighting cells.

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- 25** The diagram below shows a type of plant.



What is the primary function of the leaf structures shown by A in the diagram?

- F.** to provide the plant with water
 - G.** to carry out photosynthesis
 - H.** to protect the plant from herbivores
 - I.** to catch insects and other small prey
- 26** What feature of the genetic code makes it possible for a mouse gene to work inside the cell of a fly?
- A.** All organisms with the same number chromosomes have the same genetic code.
 - B.** The genetic code is the same for all organisms.
 - C.** The mouse gene determines the genetic code of the fly cell.
 - D.** The genetic code is the same for all animals.
- 27** When are asexually reproducing organisms at a disadvantage compared to sexually reproducing organisms and why?
- F.** during times of environmental stability; because the population expands too quickly, causing increased competition
 - G.** during times of major environmental change; because the lack of genetic variation makes the whole population vulnerable to extinction
 - H.** during seasonal changes; because they cannot reproduce as quickly as they can once a season is established
 - I.** during times of influx of new organisms to the area; because they are not used to competing with the new organisms
- 28** A student is measuring the mass of 25 beakers. Each beaker has a mass of 48.73 g. What is the total mass of all 25 beakers in kilograms and expressed to the correct number of significant digits?

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- 29** How do fossils provide evidence of relatedness between ancient ancestors and modern species?
- A.** by displaying gradual changes in specific morphological characteristics
 - B.** by showing when mass extinctions occurred
 - C.** by showing how widely separated organisms have similar features
 - D.** by showing evidence of coevolution
- 30** The table below shows the number of chromosomes in the body cells of various animals.

Number of Chromosomes in Body Cells of Various Animals	
Organism	Chromosome Number
Roundworm	2
Fruit Fly	8
Cricket	22
Mouse	40
Human	46
Pigeon	80

- Is a bar graph the **most** appropriate way to graph the data in the table?
- F.** No; it would be better to plot the data in a circle graph.
 - G.** No; it would be better to plot the data in a line graph.
 - H.** Yes; because the independent variable (the organisms) is not part of a continuous data set.
 - I.** Yes; because the dependent variable (the number of chromosomes) is not part of a continuous data set.
- 31** What can deforestation lead to?
- A.** increased biodiversity
 - B.** biological magnification
 - C.** ozone depletion
 - D.** soil erosion

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- 32** Ecologists study an isolated area in Canada and keep track of the predator and prey populations in the area. The table shows data for a six-year period.

Moose and Wolf Populations During a 6-year Period

Year	Moose Population	Wolf Population
2000	212	42
2001	220	68
2002	180	59
2003	167	55
2004	130	49
2005	159	38

Which of the following predictions for the future is **most likely**?

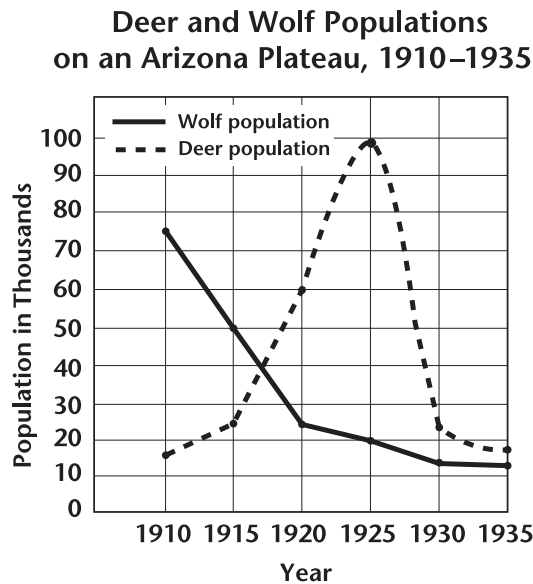
- F. The small moose population will no longer support a large wolf population. Wolves will starve, and the moose population will then recover.
 - G. Both species will become extinct when wolves eat all the moose and then have no prey to support their population.
 - H. Both populations will reach equilibrium and stay constant.
 - I. There is no pattern, and it is impossible to make a prediction.
- 33** Suppose you read in a newspaper that Mega-Cola Company sponsored a study that proves the safety of sugar substitute X for use in foods and beverages. The study was published in a peer-reviewed journal. Which statement below summarizes the **best** scientific response to the statement in the newspaper?
- A. The research should not be questioned, as it has been peer-reviewed.
 - B. The research may be questionable, as it was sponsored by a company that would benefit from the positive findings.
 - C. The study was a scientific study, therefore you can accept it without question.
 - D. Mega-Cola Company is a big, well known company, therefore its research can be always trusted.
- 34** Generally, only about 10 percent of the energy at one trophic level is converted to biomass at the next energy level. The chart shows the amount of energy that scientists estimate is available at various trophic levels in an ecosystem.

Trophic level	Amount of energy (kcal)
Producers	43 kcal
Primary consumers	430 kcal
Secondary consumers	? kcal
Tertiary consumers	43,000 kcal

How many kcal are available to **secondary** consumers?

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- 35** What are the bacteria and fungi that recycle nutrients in an ecosystem?
- F. producers
 - G. decomposers
 - H. third-level consumers
 - I. first-level consumers
- 36** The graph below shows deer and wolf population data from 1910 to 1935.



- Which of the following is a conclusion that may be drawn from the data?
- A. A deer population is greatest when the wolf population is smallest.
 - B. A deer population may drop even if a wolf population is low.
 - C. The deer population has eliminated the wolf population.
 - D. The community is the healthiest when the deer and wolf populations are equal.
- 37** Which of the following statements about the effect of the oxygen produced by the first photosynthetic autotrophs is **false**?
- F. The oxygen they produced reacted with the iron in the oceans, forming iron oxide.
 - G. The oxygen they produced gave rise to the ozone layer.
 - H. The oxygen they produced reacted with the carbon monoxide in the atmosphere, forming carbon dioxide.
 - I. The oxygen they produced caused the first mass extinction on Earth.

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- 38** A set of fossils from about 2 million years ago is named *Homo habilis*, which means “handy man”. Why is this name appropriate for these fossils?
- A. *Homo habilis* had strong fingers and toes which was helpful for climbing trees.
 - B. *Homo habilis* lived in groups and helped others living in the group.
 - C. All of the *Homo habilis* fossils that have been discovered are male.
 - D. Some of the *Homo habilis* fossils were found with tools made of stone and bone.
- 39** What are two factors that increase the genetic variation in a population?
- F. crossing over and meiosis
 - G. crossing over and mitosis
 - H. budding and mitosis
 - I. budding and meiosis
- 40** A scientist owns a company that is producing a new chemotherapy drug, and the scientist is doing the research. What helps ensure that the scientist’s work isn’t biased in favor of the company?
- A. publishing the research in the company’s newsletter
 - B. publishing the research in a peer-reviewed journal
 - C. publishing the research in the local newspaper
 - D. publishing the research in a national news magazine
- 41** Cancer is a disorder in which some cells lose the ability to control which of the following?
- F. their size
 - G. their weight
 - H. their mass
 - I. their growth rate
- 42** Although fertilizers have been very important in increasing the food supply, there have also been negative effects from the overuse of fertilizers. How can the overuse of fertilizers kill crop plants?
- A. It can cause salts to build up in the soil.
 - B. It can cause roots to absorb too much nitrogen.
 - C. It can cause transpiration rates to increase.
 - D. It can cause soil to erode at a faster rate.
- 43** Which of the following helps slow the loss of biodiversity due to human activity?
- F. Clearing forests
 - G. Increasing fossil fuel use
 - H. Practicing sustainable development
 - I. Building dams for hydroelectric power

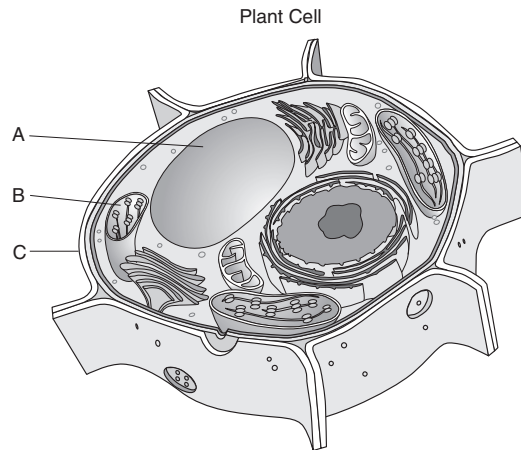
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- 44** A person with diabetes may need to take insulin every day. Which technology would probably be **most** important to that person?
- A. testing parents for genetic disorders before they have children
 - B. engineering fruits and vegetables that resist insects and other pests
 - C. developing ways to identify criminals through DNA fingerprinting
 - D. using recombinant DNA to produce human hormones from bacteria
- 45** During an experiment, a student removes 8.65 mL of solution from a beaker containing 40.00 mL of solution. How much liquid (mL) is remaining in the beaker, reported to the correct number of significant digits?
- 46** After the eighth week of development, what is the human embryo called?
- F. a zygote
 - G. an infant
 - H. a fetus
 - I. a morula
- 47** Which of the following statements is **not** used to define science?
- A. Science is a way of knowing.
 - B. Science is a process.
 - C. Science includes the study of astrology.
 - D. Science refers to the body of knowledge that scientists have gathered over the years.
- 48** Which of the following statements correctly explains why ice stays at the top of oceans instead of sinking to the bottom?
- F. Ice is colder than liquid water.
 - G. Ice is less dense than liquid water.
 - H. Ice is more dense than liquid water.
 - I. Ice is warmer than liquid water.
- 49** A student wants to find out more information about global warming. Which would be the **most** reliable source to use?
- A. a newspaper article
 - B. a university's Web site
 - C. an anonymous blog
 - D. a transcript of a politician's speech

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- 50** The illustration below shows a generalized diagram of a plant cell.



What is Structure C? What are its main functions?

- F.** cell membrane: to actively move raw materials in and waste materials out of the cell
 - G.** cell wall: to support, shape, and protect the cell
 - H.** cell membrane: to store cellulose and lipids
 - I.** cell wall: to reduce the loss of water from the cell and take in needed materials by endocytosis
- 51** Which of the following questions can be answered through science?
- A.** Which peanut butter tastes better, all natural peanut or processed peanut butter?
 - B.** Which organism has more chromosomes, a zebra or a frog?
 - C.** Which is more comfortable, a polyester fabric or a cotton fabric?
 - D.** Which artist was better, Leonardo da Vinci or Claude Monet?
- 52** Which of the following **best** describes a scientific theory?
- F.** A theory is considered an absolute truth.
 - G.** A theory can never be revised.
 - H.** A theory is used when scientists aren't certain about an observation or hypothesis.
 - I.** A theory is a well-tested explanation for a wide range of phenomena.
- 53** Which of the following **best** describes a scientific law?
- A.** A scientific law is the same as a scientific theory.
 - B.** A scientific law is a well supported description.
 - C.** A scientific law is a well supported explanation.
 - D.** A scientific law is the same as a scientific hypothesis.

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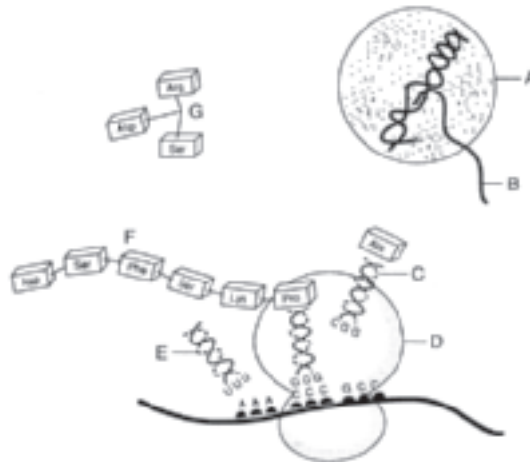
- 54** During cellular respiration, cells break down sugars in order to produce which of the following substances?
- F. ammonia
 - G. ATP
 - H. glucose
 - I. oxygen
- 55** One way to speed a chemical reaction is to heat the substances involved, providing activation energy for the reaction. The temperature required for many reactions that are necessary to life is higher than normal body temperature. What allows these reactions to take place at normal body temperature?
- A. Enzymes add additional energy to chemical reactions.
 - B. Carbohydrates provide additional energy for body cells.
 - C. Lipids store extra energy that can be used in the reactions.
 - D. Enzymes reduce the activation energy required for the reactions.
- 56** How are photosynthesis and cellular respiration related, in terms of energy transformation?
- F. The energy transformed by photosynthesis is used to power cellular respiration.
 - G. The energy transformed by cellular respiration is used to power photosynthesis.
 - H. Photosynthesis and cellular respiration both transform the same amount of energy.
 - I. Energy is not transformed in either photosynthesis or cellular respiration.
- 57** When Mendel crossed round yellow peas with wrinkled green peas, what did he find out about the genes for these two traits?
- A. they are sorted and inherited separately
 - B. they are sorted and inherited together
 - C. they are codominant
 - D. they are incompletely dominant
- 58** Which of the following are chemical compounds in the environment that are known to cause cancer?
- F. carcinogens
 - G. antigens
 - H. histamines
 - I. cytotoxins

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- 59** Which of the following is **not** a public health measure that would help prevent disease?
- A. monitoring and regulating food and water
 - B. promoting vaccinations
 - C. promoting appropriate behaviors
 - D. exposing individuals to diseases to build active immunity
- 60** Which of the following is a way that heredity affects a person's health.
- F. A person with a family history of laziness is more likely to catch the common cold.
 - G. A person with a family history of high blood pressure is more likely to have heart disease.
 - H. A person with a family history of obesity is less likely to enroll weight loss plans.
 - I. A person with a family history of cancer is less likely to seek regular cancer screenings.
- 61** What characteristic of the structure of DNA allows replication to occur?
- A. The arrangement of the phosphate groups
 - B. The support from the sugar groups
 - C. The way the bases pair up
 - D. The helical shape of the molecule
- 62** In the diagram, information from mRNA is used to produce proteins.

Protein Synthesis



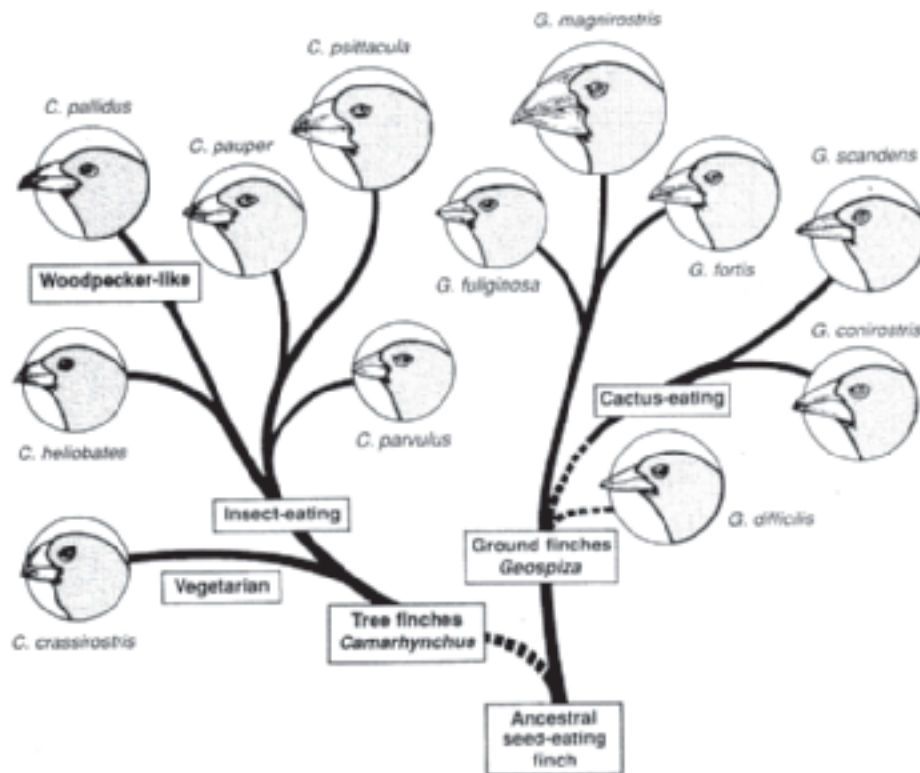
What is this process called?

- F. Transcription
- G. Translation
- H. Replication
- I. Gene regulation

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- 63** Which of the following statements about natural selection is true?
- A. It acts only on populations that have great genetic variation.
 - B. It acts on the phenotype of an organism and not on its genotype.
 - C. It acts more strongly on populations on the mainland than on islands.
 - D. It always leads to greater diversity.
- 64** According to the diagram below, finches share a recent common ancestor.



If this hypothesis is true, what was the final mechanism that separated them into different species?

- F. geographic isolation
- G. behavioral isolation
- H. temporal isolation
- I. reproductive isolation

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- 65** A forest area is cleared for farms. A few years later, the farms are abandoned, letting weeds and grasses overtake the land. If the area is not disrupted again by human activity, which of the following is **most likely** to happen over time?
- A.** The grasses will deplete the available resources that plants need, making the area barren.
 - B.** The area will continue to be dominated by weeds and grasses.
 - C.** The grasses will be replaced by shrubs and trees similar to those that made up the original forest.
 - D.** The area will likely become a dry tropical forest.

