BIOLOGY E/M TEST

FOR BOTH BIOLOGY-E AND BIOLOGY-M, ANSWER QUESTIONS 1–60

Directions: Each set of lettered choices below refers to the numbered questions or statements immediately following it. Select the one lettered choice that best answers each question or best fits each statement, and then fill in the corresponding oval on the answer sheet. A choice may be used once, more than once, or not at all in each set.

Questions 1–3 refer to the following parts of the human digestive system.

(A) Salivary glands
(B) Gall bladder
(C) Stomach
(D) Large intestine
(E) Liver

1. Contains symbiotic bacteria such as *E. coli*

2. Has a pH of less than 2 due to secretions of hydrochloric acid

3. Where bile is stored and concentrated

Questions 4–6 refer to members of the kingdom Plantae.

(A) Bryophytes
(B) Gymnosperms
(C) Seedless vascular plants
(D) Angiosperms
(E) Legumes

4. Divided into two subgroups—monocots and dicots

5. Include club mosses, horsetails, and ferns

6. Lack true roots, stems, and leaves

Questions 7–9 refer to the world's biomes.

(A) Taiga
(B) Tropical rainforest
(C) Tundra
(D) Savanna
(E) Desert

7. Exhibits radical temperature changes between night and day

8. Covered by ice sheets for the majority of the year

9. Has the highest rainfall of all biomes and the greatest plant and animal diversity

Questions 10–12 refer to the following components of DNA synthesis.

(A) Transcription
(B) Replication
(C) Messenger RNA
(D) Translation
(E) Transfer RNA

10. The process of assembling an RNA molecule that is complementary to a strand ofDNA

11. The process of creating an exact copy of a double helix of DNA

12. Carries a specific amino acid to a growing polypeptide chain

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Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Some questions pertain to a set that refers to a laboratory or experimental situation. For each question, select the best answer to the question and fill in the corresponding oval on the answer sheet.

13. Peristalsis during digestion and constriction of bronchioles during breathing are both actions of muscles that are

    (A) striated and involuntary
    (B) smooth and involuntary
    (C) striated and voluntary
    (D) smooth and voluntary
    (E) striated and smooth

14. A lion stalks an antelope, kills it, and then eats it. Which set of terms best describes the lion?

    (A) Prey, consumer, heterotroph
    (B) Predator, producer, heterotroph
    (C) Predator, consumer, heterotroph
    (D) Carnivore, consumer, autotroph
    (E) Prey, producer, autotroph

15. Which of the following is NOT true of enzymes?

    (A) Enzymes lower the activation energy for a reaction.
    (B) A single enzyme cannot be used repeatedly in many reactions.
    (C) Enzymes are catalytic proteins.
    (D) Enzymes are substrate-specific.
    (E) Enzyme performance is affected by temperature and pH.

16. What component of the circulatory system is responsible for fighting off infectious diseases?

    (A) Red blood cells
    (B) White blood cells
    (C) Hemoglobin
    (D) Platelets
    (E) Lymph

17. A community made up of a species of grass, deer, and wolves exists in equilibrium. The deer eat the grass, and the wolves eat the deer. What would likely happen to the deer population if a disease suddenly eliminated the wolf population from the community?

    (A) The deer population would increase exponentially.
    (B) The deer population would increase exponentially, then crash and level off.
    (C) The deer population would remain the same.
    (D) The deer population would crash, then increase and level off.
    (E) The deer population would crash.

18. An example of a mutualistic relationship is

    (A) A tapeworm fills a man's digestive system and makes him malnourished.
    (B) A spider kills and eats its partner after mating.
    (C) A bird helps pollinate a plant while getting nutrients from the plant.
    (D) A bird eats the insects flushed up by grazing cattle but does not harm or help the cattle.
    (E) A swarm of mosquitoes bites children at a picnic.

19. In a plant cell, respiration occurs in

    (A) chloroplasts
    (B) thylakoids
    (C) ribosomes
    (D) the nucleus
    (E) mitochondria

20. ATP is required for

    (A) passive transport
    (B) facilitated diffusion
    (C) osmosis
    (D) active transport
    (E) diffusion

21. Sweat glands and sebaceous glands would be found in

    (A) the epidermis
    (B) the hypodermis
    (C) the dermis
    (D) hair follicles
    (E) keratin follicles

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22. Which of the following is not required in order for evolution to occur?

(A) More organisms must be born than can survive to reproduce.
(B) There must be phenotypic variation among organisms in a population.
(C) The phenotypic variations must be heritable (passed from parent to offspring).
(D) A better trait must be acquired over an individual's lifetime.
(E) Some phenotypic variations must be more beneficial to survival than others.

23. Rods and cones can be found in the

(A) eyes
(B) skin
(C) ears
(D) nose
(E) taste buds

24. Rank the following bonds in order from strongest to weakest.

(A) Ionic bond, hydrogen bond, polar covalent bond
(B) Polar covalent bond, ionic bond, hydrogen bond
(C) Hydrogen bond, ionic bond, polar covalent bond
(D) Ionic bond, polar covalent bond, hydrogen bond
(E) Hydrogen bond, polar covalent bond, ionic bond

25. A freshman moves into a college dorm. For the first month, he has a hard time studying at his desk because of his three noisy roommates. After a while, he is able to ignore the noise and study well. This is an example of

(A) habituation
(B) imprinting
(C) conditioning
(D) associative learning
(E) instinctual behavior

26. Turner's Syndrome (XO) is a chromosomal disorder that can be diagnosed by

(A) pedigree analysis
(B) biochemical analysis
(C) Punnett square analysis
(D) karyotyping
(E) blood type analysis

27. A scientist observes that an organism has the following characteristics: a hard shell, bilateral symmetry, a complete digestive tract and circulatory system, and a single muscular structure for movement. This organism belongs to the phylum

(A) Mollusca
(B) Arthropoda
(C) Cnidaria
(D) Porifera
(E) Platyhelminthes

28. When a protein loses its three-dimensional structure, it is said to be

(A) activated
(B) denatured
(C) nucleated
(D) dehydrated
(E) hydrolyzed

29. A human sex cell has

(A) the same number of chromosomes as a somatic cell
(B) 48 chromosomes
(C) 46 chromosomes
(D) 23 chromosomes
(E) a diploid number of chromosomes

30. Members of the same class are more closely related than members of the same

(A) species
(B) genus
(C) family
(D) phylum
(E) order

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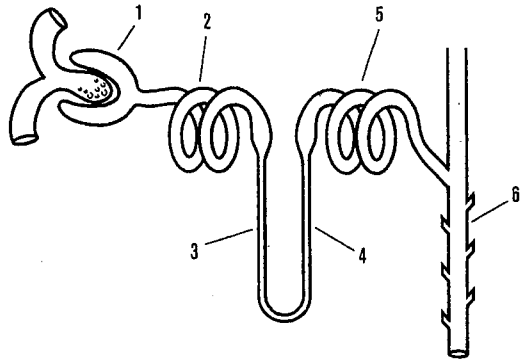
Questions 31–34 refer to the following diagram of a nephron.



31. Most reabsorption occurs in structure

(A) 2
(B) 3
(C) 4
(D) 5
(E) 6

32. Which of the following does not enter structure 1?

(A) Water
(B) Salts
(C) Red blood cells
(D) Amino acids
(E) Urea

33. The correct pathway for the elimination of urine is

(A) kidney, ureter, bladder, urethra
(B) kidney, bladder, ureter, urethra
(C) bladder, ureter, kidney, urethra
(D) bladder, urethra, kidney, ureter
(E) ureter, kidney, bladder, urethra

34. Nitrogenous wastes are the result of the metabolic breakdown of

(A) disaccharides and polysaccharides
(B) amino acids and nucleic acids
(C) lipids and phospholipids
(D) vitamins and minerals
(E) carbohydrates and monosaccharides

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Questions 35–36 refer to an experiment with reptiles.

A certain rare lizard is found only in New Zealand. This lizard has temperature-dependent sex determination, which means that the sex of its offspring is determined by the temperature at which its eggs are incubated. Scientists conducted an experiment to study the pattern of sex determination in the reptile. They incubated the eggs at different temperatures during each half of incubation and noted the sex of the hatchlings.

Temperature During First Half of Incubation	Temperature During Second Half of Incubation	Sex of the Hatchlings
> 25° C	> 25°C	Male
> 25° C	< 25° C	Female
< 25° C	> 25° C	Male
< 25° C	< 25° C	Female

35. Which of the following statements is supported by the data?

(A) If an egg is kept at a temperature less than 25°C during the first half of incubation, the lizard will always be male.
(B) If an egg is kept at a temperature greater than 25°C during the first half of incubation, the lizard will always be female.
(C) If an egg is kept at a temperature less than 25°C during the second half of incubation, the lizard will always be male.
(D) The sex of the lizard is determined by the temperature during the first half of incubation.
(E) The sex of the lizard is determined by the temperature during the second half of incubation.

36. Based on this data, what effect could global warming have on this population of lizards?

(A) The population will grow exponentially.
(B) There will be more males than females.
(C) There will be more females than males.
(D) The sex ratio of the population will stay the same.
(E) There will not be enough males to fertilize the eggs that females lay.

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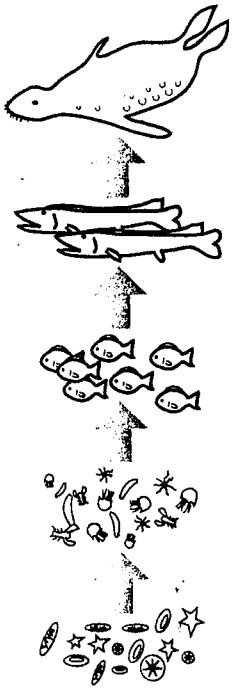
Questions 37–39 relate to the aquatic food chain below.



37. The forage fishes are

(A) primary producers
(B) consumers
(C) autotrophs
(D) saprophytes
(E) secondary producers

38. Which trophic level would have the most energy?

(A) Fish-eating predators
(B) Predator fishes
(C) Forage fishes
(D) Zooplankton
(E) Phytoplankton

39. A pesticide production plant accidentally dumps DDT into the bay. The average amount of DDT found in a forage fish is 2 parts per million, while the average amount found in a fish-eating predator is 10 parts per million. This is an example of

(A) amplification
(B) biomagnification
(C) energy loss
(D) chemosynthesis
(E) biodampening

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Questions 40–42 refer to a breeding experiment using plants with unknown genotypes. The plant phenotypes include a plant with red flowers and a plant with white flowers.

	Offspring	
Cross	**Red**	**White**
I. Red is self-pollinated	100	0
II. White is self-pollinated	0	100
III. Red is cross-pollinated with white	100	0
IV. Red is cross-pollinated with white	50	50

40. In which of the crosses is at least one parent homozygous for red flowers?

(A) I only
(B) III only
(C) IV only
(D) I and III only
(E) I and IV only

41. If the offspring in Cross III had all been pink, then the gene for flower color would be an example of

(A) complete dominance
(B) incomplete dominance
(C) codominance
(D) complete recessiveness
(E) polygenetics

42. If the red progeny of Cross III are self-pollinated, what is the probability that an individual offspring will be red?

(A) 0%
(B) 25%
(C) 50%
(D) 75%
(E) 100%

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Questions 43–44 refer to the following sequence of nucleotides in an mRNA strand.

AAAGCGCUAGCUCUG

43. What would be the nucleotide sequence on the strand of tRNA that will associate with this mRNA?

(A) TTTCGCGATCGACAC
(B) UUUCGCGAUCGAGAC
(C) CAGAGCUAGCGCUUU
(D) CACAGCTAGCGCTTT
(E) AAAGCGCUAGCUCUG

44. The mRNA strand will travel

(A) from the nucleus to the Golgi apparatus
(B) from the nucleus to the ribosomes
(C) from the ribosomes to the cytoplasm
(D) to find an amino acid
(E) to the nucleus from the cytoplasm

Questions 45–48 refer to the following laboratory exercise.

Students in a laboratory were given 5 unknown solutions and asked to correctly identify them. The solutions were: water, glucose syrup, a pure protein shake, salt water, and vegetable oil. Students ran 4 tests.

Silver Nitrate Test – A solution containing chloride will turn brown when silver nitrate is added.

Sudan Test – A solution containing fats will turn red when Sudan IV is added.

Biuret Test – A solution containing proteins will turn purple when NaOH and $CuSO_4$ are added.

Benedict's Test – A solution containing monosaccharides will turn greenish yellow when Benedict's solution is added.

Test	Solution A	Solution B	Solution C	Solution D	Solution E
Benedict's Test	+	–	–	–	–
Biuret Test	–	–	+	+	–
Silver Nitrate Test	–	+	–	–	–
Sudan Test	–	–	–	+	–

45. Solution B contains

(A) lipids
(B) nucleic acids
(C) chloride ions
(D) carbohydrates
(E) amino acids

46. The correct identity of Solution A is

(A) water
(B) glucose syrup
(C) protein shake
(D) salt water
(E) vegetable oil

47. A student added a test reagent to his solution, and the solution turned red. What reagent did he add?

(A) Protein shake
(B) Vegetable oil
(C) Salt water
(D) Water
(E) Glucose syrup

48. A polymer of amino acids is called a

(A) monosaccharide
(B) polysaccharide
(C) triglyceride
(D) polypeptide
(E) nucleic acid

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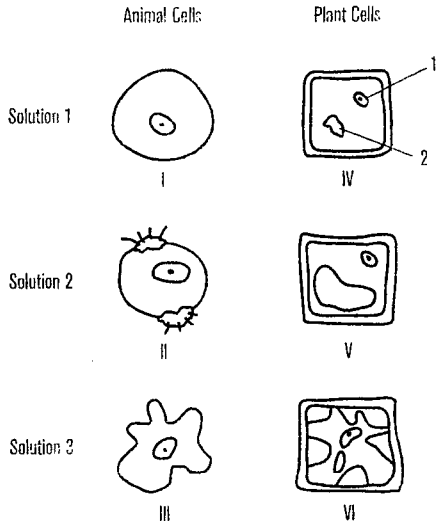
Questions 49–52 refer to the following illustrations of osmosis that is occurring in an animal and a plant cell in three different solutions.



49. With respect to cells III and VI, the surrounding solution is

(A) hypertonic
(B) isotonic
(C) hypotonic
(D) subtonic
(E) supertonic

50. The function of structure 2 is to

(A) house the genetic material
(B) synthesize proteins
(C) digest wastes
(D) protect the cell
(E) store fluid and other materials

51. Cell II swelled and then burst due to

(A) diffusion of salt from the solution into the cell
(B) diffusion of salt from the cell into the solution
(C) diffusion of water from the solution into the cell
(D) diffusion of water from the cell into the solution
(E) mismatched electrical charges in the cell

52. The plant cell and the animal cell are different because

(A) the plant is a prokaryote, and the animal is a eukaryote
(B) an animal cell has a nucleus, but a plant cell does not
(C) a plant cell has a cell membrane, but an animal cell does not
(D) a plant cell has a cell wall, but an animal cell does not
(E) an animal cell has mitochondria, but a plant cell does not

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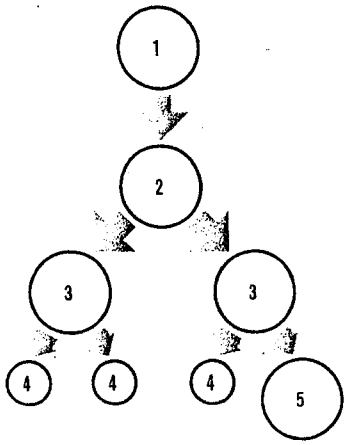
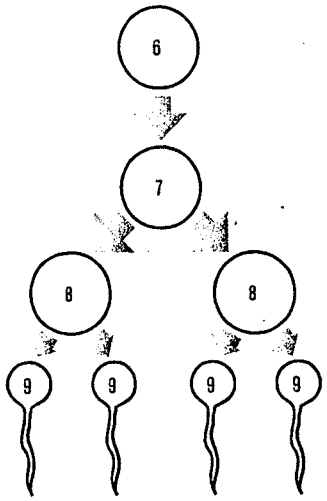
Questions 53–56 refer to gametogenesis in a human.





53. How many chromosomes are in structures 1 and 6?

(A) 48
(B) 46
(C) 24
(D) 23
(E) 0

54. The polar bodies are numbered

(A) 3
(B) 4
(C) 5
(D) 8
(E) 9

55. What process occurs to create structure 8 from structure 7?

(A) Mitosis
(B) Meiosis I
(C) Meiosis II
(D) Fertilization
(E) Oogenesis

56. The processes depicted occur in the

(A) fallopian tubes and prostate gland
(B) vagina and penis
(C) uterus and urethra
(D) ovaries and testes
(E) cervix and vas deferens

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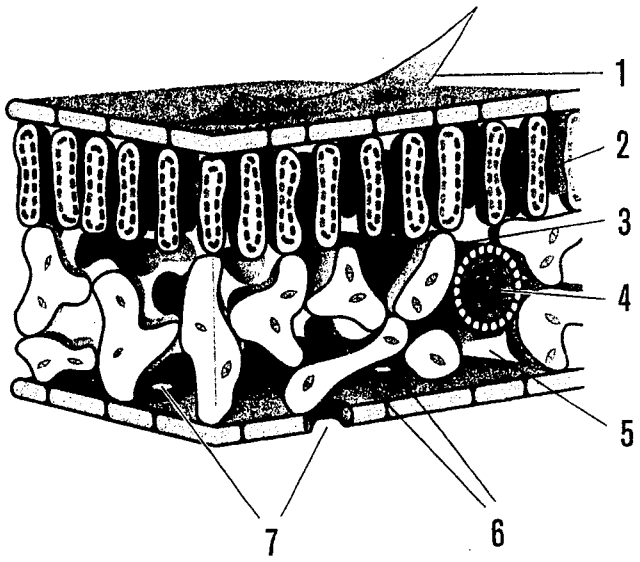
Questions 57–60 refer to the cross-section of a leaf.



57. Gases diffuse in and out of the leaf through structure

(A) 3
(B) 4
(C) 5
(D) 6
(E) 7

58. Which of the following would not be found in structure 2?

(A) Thylakoid
(B) Chlorophyll
(C) Stroma
(D) Guard cells
(E) Granum

59. All of the following are true regarding structure 4 EXCEPT

(A) It is comprised of sieve elements
(B) It distributes the products of photosynthesis
(C) It is comprised of living cells
(D) It can carry materials both up and down the plant body
(E) It will become wood

60. If structure 1 were very thick, and structure 7 were closed during the warmest part of the day, then this plant likely lives in the

(A) desert
(B) taiga
(C) rainforest
(D) temperate deciduous forest
(E) ocean

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BIOLOGY-E SECTION

If you are taking the Biology-E test, continue with questions 61–80.
If you are taking the Biology-M test, go to question 81 now.

Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Some questions pertain to a set that refers to a laboratory or experimental situation. For each question, select the one choice that is the best answer to the question and then fill in the corresponding oval on the answer sheet.

61. Counter-current exchange occurs in the respiratory system of

(A) jellyfish
(B) insects
(C) frogs
(D) humans
(E) birds

62. An earthquake creates a large crater that divides one population into two populations. Over time, the two populations become so dissimilar that they can no longer be considered populations of the same species. What process occurred?

(A) Adaptive radiation
(B) Allopatric speciation
(C) Convergent evolution
(D) Hardy-Weinberg equilibrium
(E) Larmackian evolution

63. In times of favorable environmental conditions, a particular population of organisms grows at nearly exponential speed. In times of unfavorable environmental conditions, however, the population crashes. Which of the following is likely NOT true of the organisms in the population?

(A) They reproduce early in life.
(B) They reproduce asexually.
(C) They have a short life span.
(D) They have young that require extensive parental supervision.
(E) They display little variation between individuals.

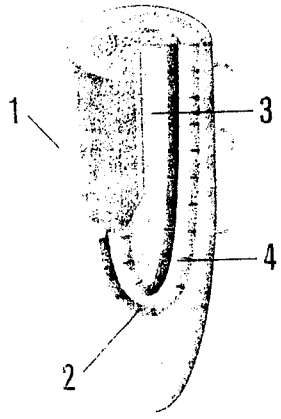
64. Suppose that a botanical disease were to destroy aspen trees in Rocky Mountain National Park. What would happen with respect to the elk population that feeds on aspen trees?

(A) The carrying capacity would decrease due to competition for space.
(B) The carrying capacity would decrease due to competition for food.
(C) The carrying capacity would increase due to competition for space.
(D) The carrying capacity would increase due to predation.
(E) The carrying capacity would increase due to disease.

65. Evolution occurs at the level of the

(A) individual
(B) population
(C) community
(D) ecosystem
(E) biome

66. In the diagram of a root, the purpose of structure 1 is to



(A) increase the absorptive area of the roots
(B) produce new cells
(C) keep CO_2 out of the plant
(D) close the stomata
(E) store chloroplasts

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Questions 67–69 refer to the following experiment.

A group of students in Texas decided to conduct an experiment with a group of students in Alaska. At the beginning of the school year, the classes in Texas and Alaska collected and dried grasses from nearby natural areas. The students put 5 grams of grass in each of 20 mesh bags. They kept 10 bags and mailed 10 bags to the students in the other state. When the bags from the other state arrived, the students took all 20 bags (10 from Texas and 10 from Alaska) to a field and nailed them to the ground in random locations. At the end of the school year, the students collected the bags and weighed them.

Here are their results:

Samples at Texas Site	Average Initial Weight	Average End Weight
Bags from Texas	5 grams	2.3 grams
Bags from Alaska	5 grams	2.8 grams

Samples at Alaska Site	Average Initial Weight	Average End Weight
Bags from Alaska	5 grams	3.9 grams
Bags from Texas	5 grams	4.1 grams

67. Which bags had the greatest change in weight?

(A) The bags from Texas that were kept in Texas
(B) The bags from Alaska that were sent to Texas
(C) The bags from Alaska that were kept in Alaska
(D) The bags from Texas that were sent to Alaska
(E) The bags from Texas and Alaska had an equal change in weight.

68. Why did the bags lose weight?

(A) Grass fell out of the bags.
(B) Water evaporated from the bags.
(C) The grass grew in the bags.
(D) Microorganisms broke down the compounds in the grass and fed on them.
(E) The grass harnessed carbon dioxide from the atmosphere.

69. The experiment taught the students about the process of

(A) photosynthesis
(B) production
(C) decomposition
(D) succession
(E) secondary consumption

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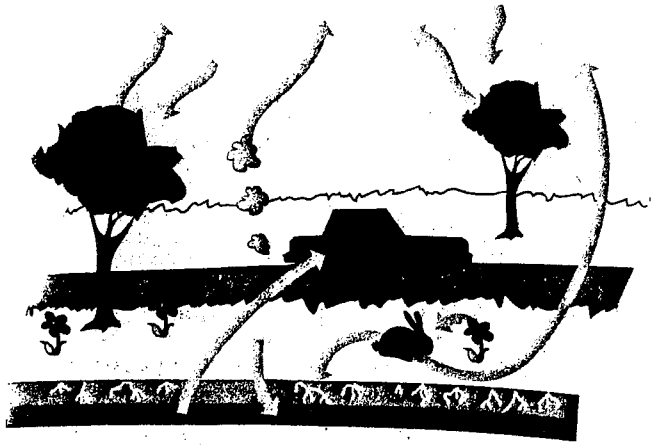
Questions 70–71 refer to the following illustration of the carbon cycle.



70. The process by which carbon dioxide is transferred from the rabbit to the atmosphere is called

(A) photosynthesis
(B) erosion
(C) carbonation
(D) respiration
(E) assimilation

71. When the rabbit eats the flower, the flower's carbon matter

(A) remains entirely in the rabbit until it dies and decomposes
(B) partially remains in the rabbit until death, and partially is given off as waste
(C) is eliminated by the rabbit through waste
(D) is given off into the atmosphere via respiration
(E) is processed by bacteria that release the carbon as carbon dioxide

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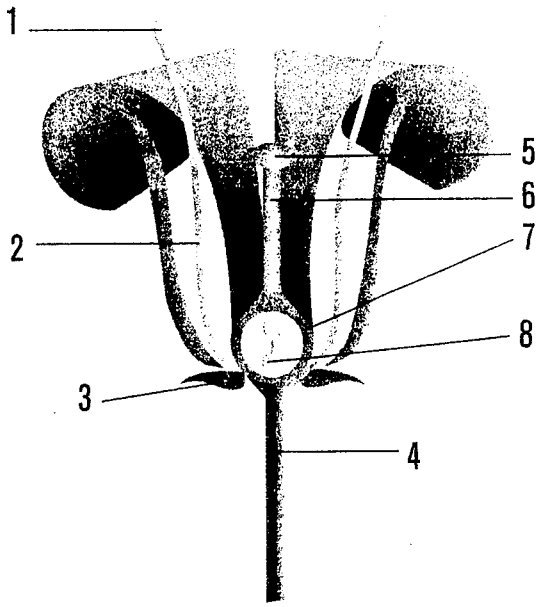
Questions 72–75 refer to the following diagram of a flower.



72. In order to fertilize the plant, pollen must land on structure

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

73. Which structure will develop into fruit after fertilization?

(A) Pollen
(B) Sepal
(C) Pistil
(D) Ovules
(E) Ovary

74. The plant in the diagram could be a

(A) fern
(B) bryophyte
(C) conifer
(D) dicot
(E) gymnosperm

75. A plant that has small and drab flowers is mostly likely to be pollinated by

(A) bees
(B) birds
(C) ants
(D) wind
(E) arthropods

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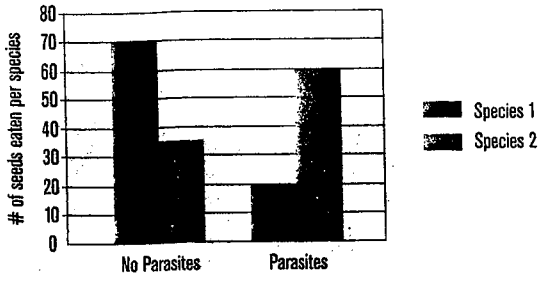
Questions 76–78 refer to the following experiment.



Two species of birds compete for seeds. These birds are susceptible to a parasite that affects their overall health. A researcher decided to count the number of seeds that the birds ate when they were free of parasites and the number of seeds that they ate when they were infected.

76. What is the number of seeds that species 2 consumed when infected by parasites?

(A) 70
(B) 35
(C) 60
(D) 20
(E) 80

77. After the birds were infected by parasites, the total number of seeds eaten by bothspecies combined

(A) increased
(B) decreased
(C) stayed the same
(D) was greater than 100
(E) was greater than 150

78. Based on the graph, what can you conclude about the effects of the parasite on competition?

(A) Parasites have no influence on competition.
(B) When parasites are present, species 1 is the better competitor.
(C) When parasites are absent, species 1 is the better competitor.
(D) Parasites affect the digestive system of the birds.
(E) Parasites increase species 1's ability to gather, consume, and digest seeds.

Questions 79–80 refer to the following scenario.

A woman hikes to the top of Mt. Denali in Alaska. Her hike starts in an area populated by coniferous trees and ends in an area where the vegetation is very short and the soil is permanently frozen 1 meter below the surface.

79. Which of the following statements describes the woman's hike?

(A) She hiked from temperate deciduous forest to tundra.
(B) She hiked from tundra to taiga.
(C) She hiked from taiga to grassland.
(D) She hiked from taiga to tundra.
(E) She hiked from tundra to temperate deciduous forest.

80. An increase in altitude often shows the same change in biomes as

(A) traveling west along the equator
(B) traveling east along the equator
(C) traveling north from the equator
(D) traveling south from the North Pole to the South Pole
(E) traveling north toward the equator

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BIOLOGY-M SECTION

If you are taking the Biology-M test, continue with questions 81–100.
Be sure to start this section of the test by filling in oval 81 on your answer sheet.

Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Some questions pertain to a set that refers to a laboratory or experimental situation. For each question, select the one choice that is the best answer to the question and then fill in the corresponding oval on the answer sheet.

81. The sides of the DNA "ladder" are made of

(A) nitrogenous bases
(B) deoxyribose and a phosphate group
(C) thymine, adenine, guanine, and cytosine
(D) uracil, adenine, guanine, and cytosine
(E) ribose and a phosphate group

82. What is the correct arrangement of the "heads" and "tails" of the phospholipids in the phospholipid bilayer?

(A) Head, tail, tail, head
(B) Tail, head, tail, head
(C) Tail, tail, head, head
(D) Head, tail, head, tail
(E) Tail, head, head, tail

83. A good example of a set of homologous structures is

(A) a person's fingers and toes
(B) the paw of a tiger and the paw of another tiger
(C) the wing of an insect and the fin of a whale
(D) the arm of a man and the wing of a bat
(E) the appendix and the tonsils

84. Which of the following requires oxygen?

(A) Glycolysis
(B) Photosynthesis
(C) Lactic acid fermentation
(D) Alcoholic fermentation
(E) The Krebs cycle

85. If you find fossilized seashells 3 feet below the surface of a sedimentary rock and fossilized trees 7 feet below the surface, you can infer that the region was

(A) a forest before it was covered by ocean
(B) a grassland before it was a forest
(C) covered by an ocean before it was a forest
(D) populated by tropical insects
(E) a desert after it was a forest

86. Red-green color blindness is an X-linked trait. If a woman is red-green colorblind, and both of her parents have normal vision, what are the genotypes of her mother and father? (X' denotes that a chromosome is positive for red-green colorblindness.)

(A) Mother is X'X, father is X'Y
(B) Mother is XX, father is X'Y
(C) Mother is XX, father is XY
(D) Mother is X'X, father is XY
(E) Mother is X'X', father is X'Y

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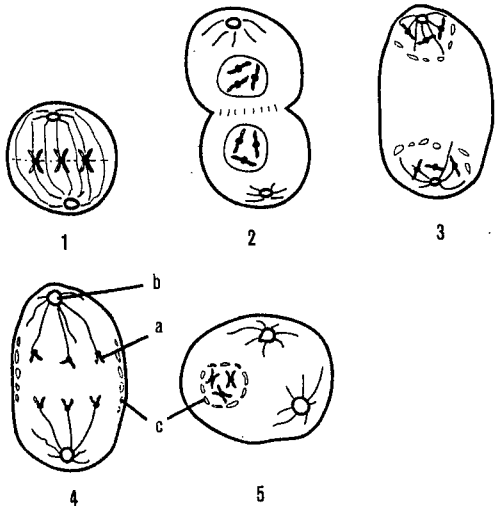
Questions 87–90 refer to the illustrations of the stages of mitosis in a human.



87. Put the illustrations in the order in which they would occur during mitosis.

(A) 2, 3, 4, 1, 5
(B) 3, 5, 4, 2, 1
(C) 1, 2, 3, 4, 5
(D) 5, 4, 2, 3, 1
(E) 5, 1, 4, 3, 2

88. The two halves of the X-shaped structure labeled "a" are called

(A) chromatids
(B) chromosomes
(C) centrioles
(D) centromeres
(E) microtubules

89. The process occurring in diagram 4 is called

(A) anaphase
(B) telophase
(C) cell division
(D) cytokinesis
(E) splitting

90. The two cells that are produced will be

(A) genetically identical, haploid, somatic cells
(B) genetically identical, diploid, sex cells
(C) genetically different, haploid, sex cells
(D) genetically identical, diploid, somatic cells
(E) genetically different, diploid, somatic cells

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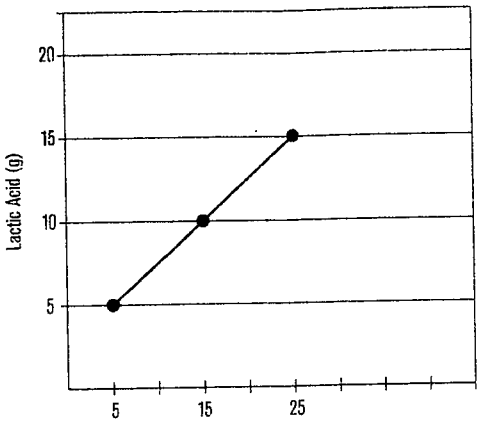
Questions 91–92 refer to cellular respiration.

Turtles often will stay underwater for long periods of time during the winter. The graph below depicts the accumulation of lactic acid in the bodies of turtles that were under water for different time periods (5, 15, and 25 days) during winter hibernation.



91. Based on the graph, what would you predict would be the amount of lactic acid in a turtle that has been under water for 35 days?

(A) 5 g
(B) 10 g
(C) 15 g
(D) 20 g
(E) 25 g

92. What is the most likely cause of the accumulation of lactic acid in the bodies ofthe turtles?

(A) Muscles in the turtles were breaking down after periods of inactivity.
(B) There was not enough oxygen in the brain to support glycolysis.
(C) There was not enough oxygen in the blood to support glycolysis.
(D) There was not enough oxygen in the blood for the Krebs cycle and electron transport chain.
(E) The CO_2 in the bloodstream inhibited the Krebs cycle.

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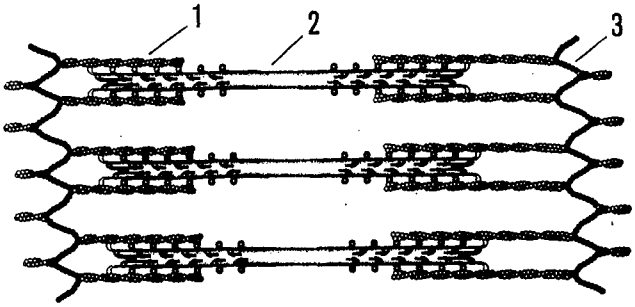
Questions 93–96 refer to the diagram of muscle tissue below.



93. Structure 1 is called

(A) actin
(B) myosin
(C) sarcomere
(D) myofibril
(E) thin filament

94. Which of the following is NOT correct?

(A) Muscle contractions are stimulated by neurons.
(B) ATP is needed for muscle contractions.
(C) During muscle contractions, the sarcomere shortens.
(D) During muscle contractions, the actin and myosin shorten.
(E) When a muscle is fully contracted, the actin and myosin completely overlap one another.

95. This arrangement of muscle fibers is found in

(A) smooth muscle only
(B) cardiac muscle only
(C) skeletal muscle only
(D) smooth and cardiac muscle
(E) skeletal and cardiac muscle

96. Muscles and bones are similar in that

(A) both are made of living cells rooted in a matrix of calcium
(B) both produce blood cells
(C) both grow when you exercise regularly
(D) both are flexible
(E) both help support and protect parts of the body

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Questions 97–100 refer to human blood types.

There is a mix-up of three babies at a hospital, and the nurse does not know which baby belongs to which parents. She thinks that she may be able to solve the problem by looking at the blood types of the parents and the babies. There are four phenotypes for blood: A, B, AB, and O.

Baby One's blood type is B. Baby Two's blood type is O. Baby Three's blood type is A.

The parents' blood types are:

Mr. Robinson - Type A	Mr. Lincoln - Type A	Mr. Smith - Type B
Mrs. Robinson - Type A	Mrs. Lincoln - Type AB	Mrs. Smith - Type B

97. Which is NOT a possible match?

(A) Baby Two - Mr. & Mrs. Smith
(B) Baby Three - Mr. & Mrs. Robinson
(C) Baby One - Mr. & Mrs. Smith
(D) Baby Three - Mr. & Mrs. Lincoln
(E) Baby Two - Mr. & Mrs. Lincoln

98. If the genotypes of Mr. and Mrs. Smith are both BB, then their baby could be

(A) Baby One only
(B) Baby Two only
(C) Baby Three only
(D) Baby One or Baby Two
(E) Baby One or Baby Three

99. The A and B alleles for blood type are

(A) recessive
(B) incompletely dominant
(C) codominant
(D) homologous
(E) analogous

100. Which two genotypes can be "crossed" to yield all four possible blood types?

(A) AB and AB
(B) Ai andBi
(C) O and AB
(D) O and O
(E) AA and Bi

S T O P

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DO NOT TURN TO ANY OTHER TEST IN THIS BOOK.