BIOLOGY TEST

Part A

Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the one that is best in each case and then blacken the corresponding space on the answer sheet.

1. Which of the following neurons gathers information directly from the external environment?
   (A) Sensory
   (B) Effector
   (C) Association
   (D) Postsynaptic
   (E) Motor

2. Which of the following adaptive features would be found in wind-pollinated flowers?
   (A) Brightly colored petals
   (B) Freely exposed anthers or stigmas
   (C) Strong odors
   (D) Petals forming landing stages
   (E) Abundant nectar

3. Which of the following cellular organelles is most closely associated with the translation activity of messenger RNA ?
   (A) Mitochondrion
   (B) Ribosome
   (C) Lysosome
   (D) Chloroplast
   (E) Golgi apparatus

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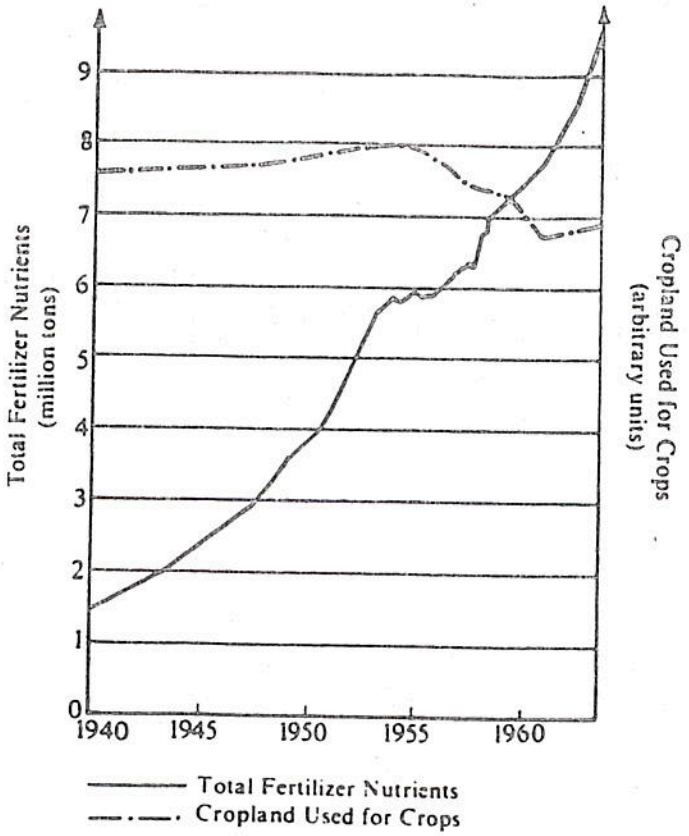
AMOUNT OF FERTILIZER APPLIED AND AREA OF LAND CULTIVATED IN THE UNITED STATES FROM 1940 TO 1963



4. From the graph above, which of the following is true about the change in the amount of cropland and of fertilizer used between 1955 and 1963 ?

	FERTILIZER	CROPLAND
(A)	Increased	Increased
(B)	Decreased	Increased
(C)	Increased	Decreased
(D)	Decreased	Decreased
(E)	No significant change	No significant change

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5. Movement of materials across animal cell membranes can be accomplished by all of the following EXCEPT
   (A) pinocytosis
   (B) phagocytosis
   (C) diffusion
   (D) active transport
   (E) denaturation

6. Root hairs of plants serve to
   (A) absorb water and dissolved minerals
   (B) release water during transpiration
   (C) protect the root cap
   (D) initiate secondary root formation
   (E) excrete organic wastes

7. Deep ocean (abyssal) communities are similar to cave communities in that both
   (A) have temperatures close to the freezing point of water
   (B) lack photosynthetic producers
   (C) have water supplies rich in calcium
   (D) include animals adapted to high pressures
   (E) are formed as a result of the activity of water

8. Mitochondria are similar to chloroplasts in that both
   (A) contain structures called grana
   (B) are sites for ATP synthesis
   (C) occur in animal cells
   (D) utilize the rays of the Sun
   (E) function only during daylight hours

9. According to our present system of classification, which of the following is LEAST closely related to the others?
   (A) Dog (B) Cat (C) Whale
   (D) Salmon (E) Man

10. In human pregnancy, the structure through which materials in solution are interchanged between the blood of the fetus and that of the mother is the
    (A) fallopian tube
    (B) ureter
    (C) navel
    (D) endometrium
    (E) placenta

11. Animals that possess a closed circulatory system include which of the following?
    I. Earthworm
    II. Frog
    III. Grasshopper
    (A) II only
    (B) III only
    (C) I and II only
    (D) I and III only
    (E) I, II, and III

12. Tracheophytes have four major characteristics: a protective layer of cells around the gametes, multicellular embryos, cuticles on parts above the soil, and conducting tissue such as xylem and phloem. The primary importance of these characteristics is that they all
    (A) accelerate transpiration in tracheophytes
    (B) aid in nitrogen fixation
    (C) enable tracheophytes to survive in land habitats
    (D) aid in the distribution of the pollen
    (E) are essential in the process of photosynthesis

13. Which of the following most accurately defines the term "species"?
    (A) All those organisms, within a certain group, that are the same color
    (B) Those members of a population capable of exchanging genetic material and producing fertile offspring
    (C) Members of a local population that share the same habitat
    (D) Organisms that look alike and share the same niche throughout the world
    (E) All organisms within the same genus

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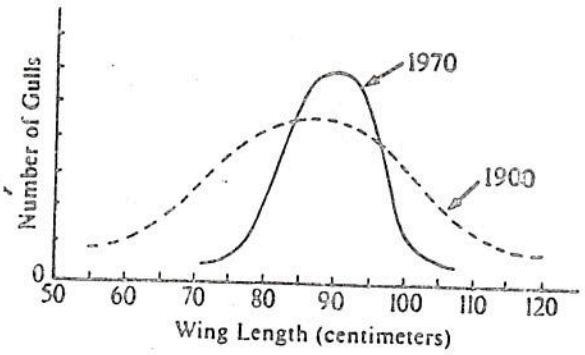


14. In 1900 and 1970, equal-sized samples of an adult gull population were studied and wing lengths were measured. The data collected are shown on the graph above. The best explanation for the change in the wing length is

(A) migration
(B) maturation
(C) disease
(D) natural selection
(E) natural disaster

15. Which of the following is NOT found in DNA molecules?

(A) Adenine
(B) Deoxyribose
(C) Phosphorus
(D) Uracil
(E) Thymine

16. In a prairie ecosystem, there is a delicate balance between populations of prairie grasses, coyotes, and jackrabbits. If the coyote population is reduced by hunting, which of the following is likely to occur?

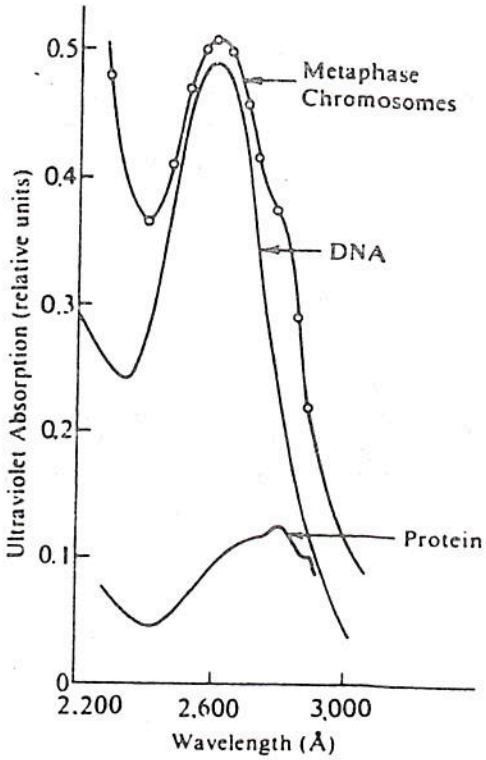
(A) The prairie grasses will be reduced over the next few years.
(B) The number of jackrabbits will be reduced significantly.
(C) The prairie grasses will be the predominant vegetation for a short time.
(D) The jackrabbits will become predators of coyotes.
(E) No change in interspecies relationships will occur.

17. All of the following organisms reproduce both sexually and asexually EXCEPT the

(A) lobster (B) hydra (C) sponge
(D) planarian (E) fluke

18. All of the following are characteristics of enzymes EXCEPT:

(A) They are proteins.
(B) They are inactivated by high temperature.
(C) They are organic catalysts.
(D) Each binds temporarily with its substrate.
(E) Each is active within a wide range of pH.



19. From the graph above showing the degree of ultraviolet absorption by metaphase chromosomes, pure DNA, and protein, which of the following can be inferred?

(A) Ultraviolet light promotes the pairing of chromosomes during metaphase.
(B) Chromosomes contain DNA.
(C) Chromosomes contain neither protein nor DNA.
(D) Chromosomes in metaphase do not absorb ultraviolet light.
(E) Proteins absorb ultraviolet light to a higher degree than does DNA.

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20. The eighteenth-century biologist who devised the binomial system of nomenclature for the classification of plants and animals was
    (A) Anton van Leeuwenhoek
    (B) Charles Darwin
    (C) Edward Jenner
    (D) Robert Hooke
    (E) Carolus Linnaeus

21. Which of the following statements about bioluminescence and photosynthesis is correct?
    (A) In photosynthesis, chemical reactions produce light; in bioluminescence, light promotes chemical reactions.
    (B) In photosynthesis, light promotes chemical reactions; in bioluminescence, chemical reactions produce light.
    (C) Both photosynthesis and bioluminescence produce light from chemical reactions.
    (D) Light promotes chemical reactions in both photosynthesis and bioluminescence.
    (E) Both photosynthesis and bioluminescence are inhibited by light.

22. The fact that humans have a coccyx (the vestigial tail vertebrae) can best be explained by which of the following?
    (A) Tails are functional in some animals.
    (B) Tails are probably mutations.
    (C) Tail formation is a recessive characteristic.
    (D) Tails were a characteristic of ancestors of humans.
    (E) Tails are required for good balance.

23. All of the following statements related to evolution are correct EXCEPT:
    (A) Characteristics of living things change with time.
    (B) Changes in species are influenced by natural selection.
    (C) Individuals cannot evolve, but populations can.
    (D) The genetic makeup of an individual is set at the time of fertilization.
    (E) Change occurs within species, but new species do not evolve.

24. Each of the following represents one of the four protozoan groups: *Plasmodium* (malarial protozoan), *Trypanosoma*, *Amoeba*, and *Paramecium*. This classification is based on
    (A) cell pigmentation
    (B) the manner in which movement is accomplished
    (C) the method employed in the uptake of oxygen
    (D) the kind of habitat in which the organisms live
    (E) the characteristics of the contractile vacuole

25. Many vitamins function as
    (A) hormones
    (B) coenzymes
    (C) nucleic acids
    (D) antibodies
    (E) buffers

26. The small intestine absorbs digested food rapidly because it
    (A) has a large surface area
    (B) has a smooth lining
    (C) lacks an appendix
    (D) is short
    (E) has a large diameter

27. During embryonic development, the germ layer from which the inner lining of the digestive tract develops is the
    (A) ectoderm
    (B) epidermis
    (C) mesenchyme
    (D) endoderm
    (E) mesoderm

28. Which of the following invertebrates is considered to be most primitive?
    (A) Arthropods
    (B) Coelenterates (Cnidaria)
    (C) Mollusks
    (D) Annelids (segmented worms)
    (E) Echinoderms

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29. Of the following, which is the best procedure for sterilizing glass test tubes?
    (A) Washing the tubes thoroughly with hot water and soap
    (B) Exposing the tubes to direct sunlight for 30 minutes
    (C) Refrigerating the tubes for 12 hours
    (D) Placing the tubes in an oven for 5 hours at 37° C
    (E) Placing the tubes in an oven for 2 hours at 200° C

30. The crab, spider, ant, and lobster are classified in the same phylum. Which of the following sets of characteristics do they share?
    (A) Segmented body and six appendages
    (B) Jointed appendages and a digestive system with a single opening
    (C) Jointed appendages and a chitinous exoskeleton
    (D) A dorsal nerve cord and a chitinous exoskeleton
    (E) A dorsal nerve cord and jointed appendages

31. The chemical element that is always present in protein but absent from fats and carbohydrates is
    (A) carbon (B) hydrogen (C) oxygen (D) nitrogen (E) sodium

32. Which of the following provides the best evidence that water is a limiting factor in the growth of plants in the desert?
    (A) A cactus transplanted to a coastal area fails to survive.
    (B) Rainfall in the desert is more common in the winter than in the summer.
    (C) Flash floods destroy many desert plants.
    (D) The volume of plant life increases when desert areas are irrigated.
    (E) Deciduous trees transplanted to the desert fail to survive.

33. Which of the following contributes most to genetic variability?
    (A) Mitosis (B) Regeneration (C) Meiosis (D) Linkage (E) Vegetative propagation

34. Although termites eat wood, they cannot digest cellulose. If newly hatched termite nymphs are prevented from eating the adults' feces, the nymphs will die. This situation is best understood if one recognizes that termites
    (A) harbor mutualistic intestinal protozoa
    (B) are highly specialized social insects
    (C) belong to the same order as the cockroach
    (D) live in the dark and thus have poorly developed eyesight
    (E) are important decomposers in the forest

35. All of the following are endocrine glands EXCEPT the
    (A) salivary
    (B) adrenal
    (C) pituitary
    (D) testis
    (E) thyroid

36. Which of the following is true about the flow of energy through a food chain?
    (A) There is more energy available to consumers than to producers.
    (B) There is more energy available to secondary consumers than to primary consumers.
    (C) There is more energy available to primary consumers than to secondary consumers.
    (D) The energy available to producers is determined by their interactions with primary and secondary consumers.
    (E) There is more energy available to decomposers than to producers.

37. Which of the following is NOT a characteristic of primates?
    (A) Flat nails
    (B) Opposable thumb
    (C) Binocular vision
    (D) Body hair
    (E) Three-chambered heart

38. The most important function of nitrates in the nitrogen cycle is to
    (A) provide a source of nitrogen for protein synthesis by plants
    (B) facilitate excretion of waste products in mammals
    (C) establish a symbiotic relationship between plants and fungi
    (D) act as a toxic agent to kill harmful bacteria
    (E) restore nitrogen gas to the atmosphere

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39. The study of crossing-over between homologous chromosomes is most useful for determining which of the following?
    (A) Number of mutations on a chromosome
    (B) Length of a chromosome
    (C) Position of genes on a chromosome
    (D) Presence of dominant genes
    (E) Occurrence of polyploidy

40. In an organism that is heterozygous for three independently assorting traits (*AaBbCc*), what fraction of its gametes will contain all three recessive genes (*abc*)?
    (A) 0 (B) 1/8 (C) 1/4 (D) 1/2 (E) 3/4

41. All of the following kinds of organisms are capable of converting light energy to chemical energy EXCEPT
    (A) maple trees
    (B) cactus plants
    (C) red algae
    (D) mushrooms
    (E) mosses

42. The primary function of NAD in the Krebs cycle is to serve as
    (A) an oxygen acceptor
    (B) an oxygen donor
    (C) a source of phosphate ions
    (D) a hydrogen ion and electron acceptor
    (E) a photosynthetic pigment

43. All of the following statements about cartilage are correct EXCEPT:
    (A) It is a part of the skeletal system.
    (B) It is less rigid than bone.
    (C) It contains salts and proteins.
    (D) It appears earlier than does bone during embryonic development.
    (E) It is richly supplied with blood vessels.

44. The oxygen given off by plants is a product of
    (A) aerobic respiration
    (B) anaerobic respiration
    (C) the light phase of photosynthesis
    (D) the dark phase of photosynthesis
    (E) oxidation of carbohydrates

45. All of the following processes are involved in translocation in plants EXCEPT
    (A) root pressure
    (B) cohesion
    (C) transpiration
    (D) capillarity
    (E) phototropism

46. The brewing of beer is an application of which of the following cellular processes?
    (A) Photosynthesis
    (B) Oxidative phosphorylation
    (C) Aerobic respiration
    (D) Fermentation
    (E) Transformation

47. Which of the following is NOT a part of the pistil?
    (A) Stigma (B) Style (C) Anther
    (D) Ovule (E) Ovary

48. As one travels northward from the geographical center of the United States, the correct sequence of major biomes (life zones) encountered is
    (A) grassland, taiga, arctic tundra
    (B) deciduous forest, alpine tundra, arctic tundra
    (C) grassland, desert, alpine tundra
    (D) desert, deciduous forest, taiga
    (E) desert, grassland, taiga

49. For which of the following pairs does the molecule given as the first term NOT contribute to the synthesis of the molecule given as the second term?
    (A) Amino acid..protein
    (B) Glucose..starch
    (C) Urea..glycogen
    (D) Phosphoric acid..nucleotide
    (E) Fatty acid..lipid

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50. Which of the following is NOT characteristic of monocots?

(A) The flower parts are usually in threes or multiples of three.
(B) The leaves have parallel veins.
(C) The stems contain cambium for production of secondary xylem.
(D) The seeds contain a single cotyledon.
(E) The seeds at maturity usually contain a large endosperm.

51. Which of the following occurs in meiosis but not in mitosis?

(A) Production of diploid cells
(B) Synapsis of homologous chromosomes
(C) Duplication of DNA
(D) Duplication of the centrioles
(E) Appearance of spindle fibers

52. Scientists who study evolution look for homologous structures when determining similarities among species. These structures are said to have been inherited from common ancestors. All of the following are examples of homologous structures EXCEPT the

(A) wings of a robin and the wings of an owl
(B) wings of a blue jay and the wings of a butterfly
(C) wings of an ostrich and the front legs of a dog
(D) front legs of a horse and the arms of a human
(E) legs of a chicken and the hind legs of a lizard

53. Factors that may contribute to divergent evolution include which of the following?

I. Separation of populations by geographic barriers, such as mountains or rivers
II. Breeding of populations at different times of the year
III. Spreading of populations into different habitats

(A) I only (B) III only (C) I and II only
(D) II and III only (E) I, II, and III

54. If a cell uses 100 amino acid molecules to produce a particular polypeptide chain in a protein, the number of water molecules formed during the process is

(A) 1
(B) 50
(C) 99
(D) 100
(E) 101

55. The primitive atmosphere existing just before the time that life arose on Earth is believed to have contained all of the following gases EXCEPT

(A) hydrogen
(B) water vapor
(C) ammonia
(D) oxygen
(E) methane

56. Which of the following represents the normal sequence of animal development?

(A) Gastrula formation—blastula formation—mesoderm formation—cleavage—somite formation
(B) Cleavage—blastula formation—somite formation—gastrula formation—mesoderm formation
(C) Cleavage—blastula formation—mesoderm formation—gastrula formation—somite formation
(D) Cleavage—blastula formation—gastrula formation—mesoderm formation—somite formation
(E) Blastula formation—gastrula formation—mesoderm formation—cleavage—somite formation

57. Replacing inorganic nutrients in soil is accomplished primarily by the

(A) first-order consumers
(B) second-order consumers
(C) herbivores
(D) producers
(E) decomposers

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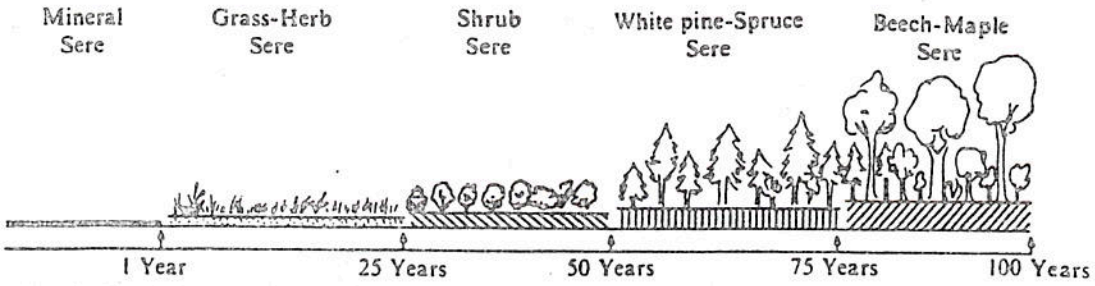
ECOLOGICAL SUCCESSION



58. The climax community in the ecosystem above is

(A) shrub
(B) white pine-spruce
(C) beech-maple
(D) mineral
(E) grass-herb

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Part B

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

Questions 59-62

(A) Trial and error
(B) Habituation
(C) Imprinting
(D) Reasoning
(E) Conditioning

59. The most complex type of learning; an ability that can be demonstrated by primates

60. Learning demonstrated when an animal randomly displays several forms of behavior until the "right" one is found or rewarded

61. Demonstrated in newly hatched chicks or ducklings when they follow the first moving object they see as though it were their mother

62. Occurs when a dog salivates at the sound of a bell because the dog has learned to associate the bell with food

Questions 63-65

(A) Amnion
(B) Allantois
(C) Yolk sac
(D) Chorion
(E) Eggshell

63. Provides for storage of the nitrogenous wastes of a developing chick embryo and functions in respiratory gas exchange

64. Forms a fluid-filled chamber in which a terrestrial animal may develop in an aquatic medium

65. Stores an adequate amount of nourishment for the egg stage of a chick's development

Questions 66-68

(A) Grafting
(B) Fission
(C) Sexual reproduction
(D) Parthenogenesis
(E) Hermaphroditism

66. A unicellular organism divides to give rise to new individuals.

67. Both male and female reproductive organs are present in the same individual.

68. In the absence of fertilization, an egg develops into a new individual.

Questions 69-70

(A) Birds
(B) Bony fish
(C) Amphibians
(D) Cartilaginous fish
(E) Reptiles

69. Have bones that are light, porous, and sometimes air-filled

70. Have toes that are soft and generally lack claws

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Questions 71-74

(A) Xylem vessel
(B) Companion cell
(C) Guard cell
(D) Apical meristem
(E) Sieve-tube element

71. Regulates the opening and closing of stomates

72. Accounts for continual growth in length of plants

73. Is usually dead in a mature plant; is cut when a finished board of lumber is sawed

74. Transports manufactured food from leaves to roots in green plants

Questions 75-78

In cats, tiger stripe (*S*) is an autosomal trait that is dominant over plain coat (*s*). In order to study this trait, breeding experiments were conducted. The lettered headings below represent the percentages of tiger-striped cats in first-generation offspring produced by different crosses that were made during the breeding experiments.

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

75. Result from crosses between a homozygous, striped male and a homozygous, plain female

76. Result from crosses between a homozygous, striped female and a homozygous, plain male

77. Result from crosses between a striped male, whose mother was plain, and a plain female

78. Result from crosses between two heterozygous, striped cats

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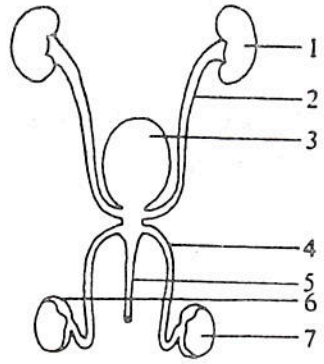
Part C

Directions: Each of the following questions refers to the diagram with certain parts labeled with numbers. Each question is followed by five suggested labels or answers. For each question select the one best answer and then blacken the corresponding space on the answer sheet.

Questions 79-83

MALE UROGENITAL SYSTEM



79. Sperm are produced in
(A) 1
(B) 3
(C) 4
(D) 5
(E) 7

80. Urine is stored in
(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

81. In a vasectomy, the tube that is tied off or cut is
(A) 2
(B) 3
(C) 4
(D) 5
(E) 6

82. Nitrogenous wastes are removed from the blood in
(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

83. Both sperm and urine are released through
(A) 2
(B) 3
(C) 4
(D) 5
(E) 6

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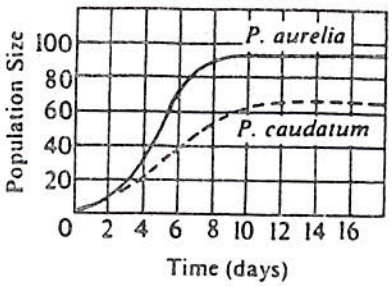
Part D

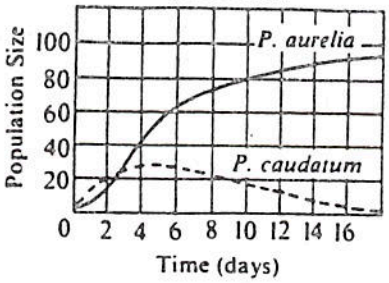
Directions: Each group of questions below concerns a laboratory or experimental situation. In each case, first study the description of the situation. Then choose the one best answer to each question following it and blacken the corresponding space on the answer sheet.

Questions 84-86 refer to the two graphs given below. Graph I shows the growth curve of *Paramecium aurelia* and *Paramecium caudatum* cultured in separate dishes. Graph II shows the growth curve of these two species cultured in the same dish. Similar conditions of food and other requirements were provided in each case.

GRAPH I
(separate dishes)



GRAPH II
(same dish)



84. The population *P. aurelia* when cultured by itself increases most rapidly
   (A) between days 0 and 2
   (B) between days 2 and 4
   (C) between days 4 and 6
   (D) between days 6 and 8
   (E) after 8 days

85. In graph I, the most likely explanation for the fact that the population curves of both *P. aurelia* and *P. caudatum* flatten out after an initial period of growth is that
   (A) organisms of both populations are no longer reproducing
   (B) population sizes have reached the maximum capacity that their environment can support
   (C) organisms of both populations have used up all the food
   (D) organisms of both populations are dying faster than they are reproducing
   (E) oxygen required by the organisms for survival has been all used up

86. The effects shown in graph II are most likely the result of
   (A) mutualism between two species
   (B) parasitism of one species by another
   (C) competition between members of the same species
   (D) competition between members of different species
   (E) toxic poisoning of one species after the first day

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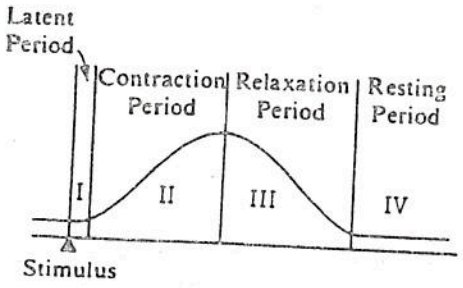
Questions 87-90 pertain to the muscle twitch of the gastrocnemius muscle of a frog in response to a stimulus. The diagram below illustrates a muscle twitch recorded on a kymograph.



87. The energy for the movement during the contraction period (II) is provided by
    (A) ADP
    (B) ATP
    (C) FAD
    (D) NAD
    (E) vitamins

88. There is very little action during the latent period for which of the following reasons?
    (A) The stimulus is changing the permeability of the membrane.
    (B) ADP is being decomposed.
    (C) The resynthesis of glycogen is taking place.
    (D) The oxygen debt is being replaced.
    (E) Actin and myosin are being synthesized.

89. Rapid and repeated stimulation of the muscle results in a buildup of
    (A) alcohol
    (B) oxygen
    (C) glucose
    (D) lactic acid
    (E) malic acid

90. The conversion of ADP to ATP in the muscle takes place primarily during
    (A) the instant that contact is made with the stimulus
    (B) I and II
    (C) I and IV
    (D) II and III
    (E) III and IV

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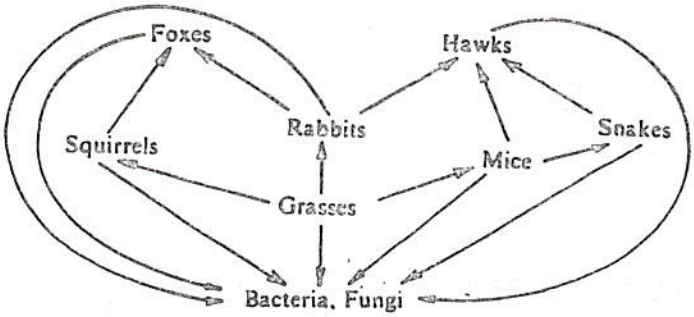
Questions 91-92 refer to the diagram of the food web below.



91. Which of the following organisms would probably be found in the fewest numbers?
    (A) Rabbits
    (B) Squirrels
    (C) Bacteria and fungi
    (D) Hawks
    (E) Snakes

92. One would expect to find a greater quantity, by weight, of
    (A) foxes than squirrels
    (B) rabbits than grasses
    (C) mice than snakes
    (D) hawks than foxes
    (E) hawks than mice

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Questions 93-94

H.B. Kettlewell carried out careful experiments of industrial melanism as related to the moth *Biston betularia*. This moth has dark and light phenotypes that are genetically determined. In repeating one of these experiments, a student released 200 light-colored and 200 dark-colored moths in a forest adjacent to a coal-burning factory. The forest had birds that are predators of the moth. After several months, the student returned to the forest to collect data.

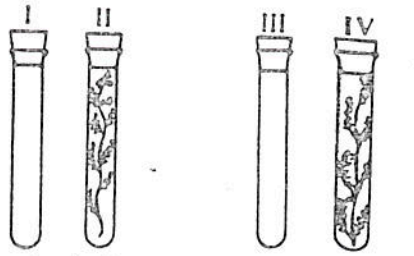
93. If the student could accurately sample this population, which of the following would be the most likely result?

(A) The numbers of the surviving light-colored moths and the dark-colored moths would be approximately the same.
(B) The number of the surviving dark-colored moths would be greater than that of the surviving light-colored moths.
(C) The number of the surviving light-colored moths would be greater than that of the surviving dark-colored moths.
(D) The ratio of the dark-colored moths to the light-colored moths that survived would be 3 to 1.
(E) The ratio of the light-colored moths to the dark-colored moths that survived would be 3 to 1.

94. In the student's experiment, which of the following is the hypothesis being tested?

(A) Natural selection favors organisms that are best adapted to their environment.
(B) Predator-prey relationships fluctuate with the seasons.
(C) Genetic dominance may be incomplete.
(D) Industrial pollution kills plant and animal life.
(E) Populations in equilibrium will remain unchanged.

Questions 95-96



Kept in the Dark at 25° C

Kept in the Light at 25° C

Four test tubes are set up as shown above. All of the tubes contain water to which a few drops of indicator have been added. The indicator used is yellow when the pH of the solution is less than 6.0, green when the solution pH is between 6.0 and 7.5, and blue when the solution pH is above 7.5. All tubes are greenish-blue at the beginning of the experiment. Tubes II and IV contain comparable sprigs of a green plant. Tubes I and II are kept in the dark; tubes III and IV are kept in the light. All are examined 24 hours later. At this time, the indicator in tube II is yellow; the indicator in tubes I, III, and IV is still greenish blue.

95. Which of the following statements about the experiment above is correct?

(A) Tubes I and III represent experimental sets.
(B) Tube II is the control for tube III.
(C) Temperature is the independent variable.
(D) Light is the independent variable.
(E) pH is the independent variable.

96. After 24 hours, the indicator in tube II is yellow because the

(A) plant photosynthesized and gave off O_2, which lowered the pH
(B) plant respired and gave off CO_2, which formed carbonic acid and lowered the pH
(C) plant could not photosynthesize and died, causing the H_2O to become alkaline
(D) plant excreted nitrogenous wastes which caused the medium to become more alkaline
(E) indicator decomposed in the dark causing the medium to become more acidic

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Questions 97-100

To test the effects of temperature on the metamorphosis and reproduction of a certain species of invertebrate, some investigators collected larvae from a creek and raised them to adulthood in the laboratory. They determined the average adult body weight, the average number of eggs laid by each female, and the time required for the adults to emerge from the larvae under five different growth temperatures. The average temperature of the creek was 18° C. The data are given in the table below.

Average Temperature	Average Body Weight (milligrams)	Average Number of Eggs	Days to Adult
18° C	0.66	248	11
16° C	1.28	350	16
14° C	1.46	380	40
13° C	0.91	289	56
11° C	0.48	212	82

97. Theoretically, the greatest number of generations of offspring per year could be produced at which temperature?

(A) 18° C
(B) 16° C
(C) 14° C
(D) 13° C
(E) 11° C

98. Theoretically, the greatest number of offspring in a single generation could be produced at which temperature?

(A) 18° C
(B) 16° C
(C) 14° C
(D) 13° C
(E) 11° C

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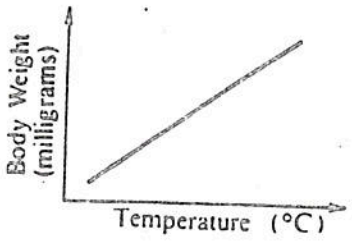
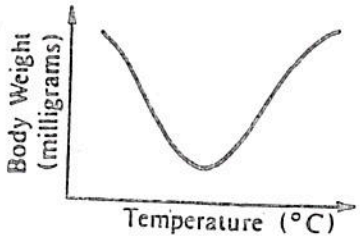
99. Which of the following graphs best represents the relationship between temperature and average adult body weight for the species studied in this experiment?

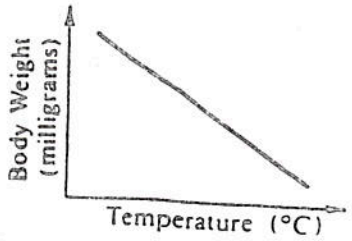
(A)



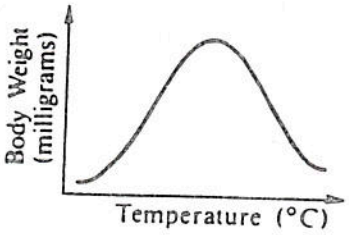
(B)



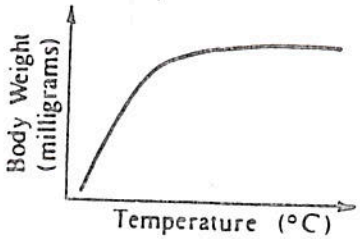
(C)



(D)



(E)



100. Suppose that some organisms of the same species had also been grown at 9° C. Which of the following would best describe the expected results?

(A) Low body weight, long developmental period
(B) Low body weight, short developmental period
(C) Low body weight, high egg production
(D) High egg production, long developmental period
(E) Low egg production, short developmental period

S T O P

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST ONLY.
DO NOT WORK ON ANY OTHER TEST IN THIS BOOK.

TABLE A

Answers to Biology Achievement Test, Form 3EAC2, and Percentage of Students Answering Each Question Correctly

Question Number	Correct Answer	Right	Wrong	Percentage of Students Answering the Question Correctly	Question Number	Correct Answer	Right	Wrong	Percentage of Students Answering the Question Correctly
1	A			92%	51	B			34%
2	B			87	52	B			46
3	B			77	53	E			60
4	C			91	54	C			26
5	E			75	55	D			31
6	A			83	56	D			28
7	B			86	57	E			79
8	B			71	58	C			81
9	D			91	59	D			88
10	E			72	60	A			91
11	C			33	61	C			66
12	C			65	62	E			79
13	B			73	63	B			25
14	D			79	64	A			42
15	D			50	65	C			73
16	A			79	66	B			78
17	A			71	67	E			68
18	E			49	68	D			64
19	B			48	69	A			74
20	E			52	70	C			81
21	B			78	71	C			77
22	D			85	72	D			51
23	E			63	73	A			31
24	B			55	74	E			30
25	B			54	75	E			55
26	A			74	76	E			53
27	D			44	77	C			53
28	B			39	78	D			56
29	E			58	79	E			88
30	C			47	80	C			89
31	D			68	81	C			84
32	D			55	82	A			78
33	C			45	83	D			94
34	A			70	84	C			87
35	A			46	85	B			81
36	C			47	86	D			59
37	E			73	87	B			66
38	A			54	88	A			18
39	C			33	89	D			71
40	B			60	90	E			19
41	D			64	91	D			43
42	D			28	92	C			32
43	E			61	93	B			74
44	C			38	94	A			77
45	E			38	95	D			45
46	D			91	96	B			35
47	C			42	97	A			45
48	A			47	98	C			69
49	C			65	99	D			71
50	C			19	100	A			66

Note: The percentages are based on the analysis of the answer sheets for a random sample of students who took this test in November 1982 and whose mean score was 543.