

PRACTICE TEST 1

Time: 60 Minutes

PART A (Core Questions 1–60—for Both Biology-E and Biology-M)

Directions: Determine the BEST answer for each question. Then fill in the corresponding oval on the answer sheet.

Questions 1–4

- (A) ribosome
- (B) mitochondria
- (C) chloroplast
- (D) endoplasmic reticulum
- (E) Golgi apparatus

1. Site where photosynthesis takes place
2. Extensive series of membranes throughout the cell
3. Powerhouse of the cell
4. Packaging and distribution system of a cell

Questions 5–7

- (A) lipids
- (B) proteins
- (C) carbohydrates
- (D) nucleic acids

5. long chains of amino acids
6. composed of only carbon, hydrogen, and oxygen
7. also known as fats

Questions 8–11

- (A) commensalism
- (B) mutualism
- (C) parasitism
- (D) symbiosis

8. Two or more organisms in a close, long-term association
9. One organism benefits, while the other suffers from the relationship.
10. Both organisms benefit from the relationship.
11. One organism benefits and the other does not benefit nor is it harmed from the relationship.





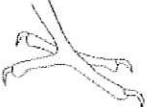
Questions 12–15

- (A) organ
- (B) cell
- (C) tissue
- (D) organ system

12. Group of cells with a similar function
13. Smallest unit of organization in living things
14. Many different groups of cells working together
15. The highest level of organization that carries out important body functions
16. Protists are classified by their
 - (A) method of feeding
 - (B) method of moving
 - (C) method of reproducing
 - (D) size
 - (E) habitat
17. The part of the human brain that controls balance, posture, and coordination is the
 - (A) cerebrum
 - (B) cerebellum
 - (C) medulla oblongata
 - (D) thalamus
 - (E) hypothalamus
18. The characteristics that gymnosperms and angiosperms share are
 - (A) leaves, rhizomes, and spore
 - (B) leaves, stems, roots, and seeds
 - (C) flat leaves, trunks, and naked seeds
 - (D) lack of vascular tissue and small leaflets
 - (E) needle-like leaves, stems, roots, and fleshy fruits

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PRACTICE TEST—Continued

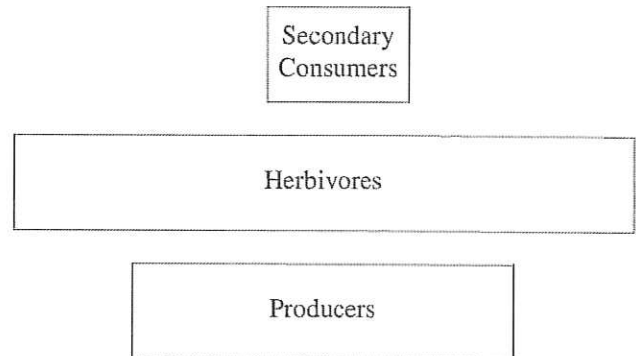
19. All of the following are characteristics of living things EXCEPT for the ability to
- perform cellular respiration
 - regulate their internal environment
 - reproduce
 - change their external environment
 - pass traits to offspring
20. What happens to an enzyme during a biochemical reaction?
- It becomes part of the product.
 - It is unchanged.
 - It is broken down into amino acids.
 - It reacts with fatty acids.
 - It becomes a polypeptide.
- 21.
- monera
 - plants
 - protists
- Which kingdom(s) contain(s) chemotrophs as members?
- I only
 - II only
 - III only
 - I and III only
 - I, II, and III
22. Which bird has feet that are modified for grasping prey?
- 
 - 
 - 
 - 
 - 
23. In RNA molecules, uracil is complementary to
- thymine
 - guanine
 - cytosine
 - adenine
 - uracil
24. Most mutations result from
- certain chemicals
 - ionizing radiation
 - infrared radiation
 - ultraviolet radiation
 - random events
25. The first vertebrates to evolve a three-chambered heart that ensured all cells in the body received the proper amount of oxygen are the
- fishes
 - reptiles
 - amphibians
 - birds
 - mammals
26. Which is the correct order of stages for an insect that undergoes complete metamorphosis?
- egg→larva→adult
 - egg→nymph→adult
 - egg→nymph→larva→adult
 - egg→larva→pupa→adult
 - egg→nymph→pupa→adult
27. Which process brings carbon into the living portion of its cycle?
- photosynthesis
 - cellular respiration
 - combustion
 - decomposition
 - fixation
28. Microspores of gymnosperms eventually develop into
- seeds
 - cotyledons
 - female gametophytes
 - pollen grains
 - archegonia


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PRACTICE TEST—Continued

29. Bacteria are an important part of most food chains because they serve as
- primary consumers
 - secondary consumers
 - scavengers
 - decomposers
 - producers
30. Ground tissue provides all of the following functions in plants EXCEPT
- protection of other tissues
 - supporting the plant
 - storage of water and carbohydrates
 - transport of materials
 - photosynthesis
31. Which of the following scientific names is written in the correct form to identify a species?
- meleagris gallopavo*
 - Meleagris Gallopavo*
 - Meleagris Gallopavo
 - Meleagris gallopavo
 - Meleagris gallopavo*
32. Which best describes the source of genes in an offspring resulting from sexual reproduction?
- The offspring gets a full set of genes from the mother and from the father.
 - The offspring gets half the genes from the mother and half the genes from the father.
 - The offspring gets all of its genes from the father.
 - The offspring gets a random mixture of genes from the mother and father.
 - The offspring gets all of its genes from the mother.

33. Which best describes how the following ecosystem will change over time?



- The herbivores will decline because there is not enough food to support them.
 - The herbivores will increase and the secondary consumers increase.
 - The populations of producers, herbivores, and carnivores will remain the same.
 - The secondary consumers will decline and the producers will increase.
 - The producers will increase to support the herbivores.
34. If an organism has a haploid number of 28, how many chromosomes does it have?
- 7
 - 14
 - 28
 - 42
 - 56
35. A pea plant with a genotype of YY produces yellow seeds. A pea plant with a genotype of yy produces green seeds. If the pea plants are crossed, which describes the possible genotypes of the offspring?
- all are YY
 - all are Yy
 - all are yy
 - half YY and half yy
 - half YY and half Yy

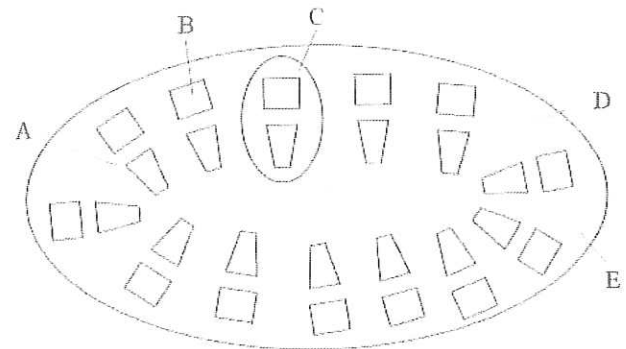
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PRACTICE TEST—Continued

36. Which set of offspring would result from a cross that was controlled by the law of independent assortment?
- (A) Half the offspring are tall with white flowers and half are short with white flowers.
 (B) All the offspring are tall or short and have white or purple flowers.
 (C) All the offspring are short and have purple flowers.
 (D) All the offspring are tall and have white flowers.
 (E) All the offspring are tall and have purple flowers.
37. Which of the following statements about evolution is accurate?
- (A) Populations evolve while individuals do not evolve.
 (B) Populations do not evolve while individuals evolve.
 (C) Populations evolve only when individuals evolve.
 (D) Populations evolve only when isolated individuals evolve.
 (E) Populations evolve only through mutations.
38. On the human skeletal system, which type of joint allows rotational movement?
- (A) slightly moveable joint
 (B) ball-and-socket joint
 (C) pivot joint
 (D) plane joint
 (E) saddle joint
39. Which of the following best describes what will happen if cells are placed in a very salty solution?
- (A) The cells remain unchanged.
 (B) Water moves from inside of the cell to the outside.
 (C) Water moves from outside of the cell to the inside.
 (D) The cells burst.
 (E) The cells dissolve.
40. The color red and the color white are codominant in horses. What would you expect if you crossed a homozygous red horse with a homozygous white horse?
- (A) The offspring is white.
 (B) The offspring is red.
 (C) The offspring has both red and white hairs.
 (D) The offspring is brown.
 (E) The offspring is black.
41. The DNA of two closely related species would likely be
- (A) completely different
 (B) somewhat different
 (C) very different
 (D) very similar
 (E) identical
42. All of the following are mechanisms of reproductive isolation EXCEPT
- (A) geographical isolation
 (B) ecological isolation
 (C) temporal isolation
 (D) reproductive failure
 (E) niche overlap
43. The process of photosynthesis produces many products. Which of these products are used for starting cellular respiration?
- (A) oxygen and ATP
 (B) water and carbon dioxide
 (C) NADP and hydrogen
 (D) glucose and oxygen
 (E) carbohydrates and NADP

Questions 44 and 45

This diagram is a cross section through the primary stem of a woody plant.



44. Which part of this stem is the vascular tissue?
- (A) A
 (B) B
 (C) C
 (D) D
 (E) E

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PRACTICE TEST—*Continued*

45. Which part of this stem will develop into the bark of the woody plant?
- (A) A
 - (B) B
 - (C) C
 - (D) D
 - (E) E
46. Sequences of DNA that are easily and naturally copied from one location in the genome and inserted elsewhere are called
- (A) duplication genes
 - (B) jumping genes
 - (C) crossing over genes
 - (D) recessive genes
 - (E) deletion genes
47. A bat wing and a human's arm are examples of
- (A) homologous structures
 - (B) analogous characters
 - (C) vestigial structures
 - (D) adaptive structures
 - (E) derived traits
48. A type of mutation that occurs when part of a chromatid breaks off and attaches to its sister chromatid resulting in the duplication of a gene on a chromosome is called
- (A) deleting
 - (B) inserting
 - (C) separating
 - (D) substituting
 - (E) inverting
49. Cellular respiration in the absence of oxygen is called fermentation. What is the product of fermentation in animal cells?
- (A) Acetyl-CoA
 - (B) alcohol
 - (C) carbon dioxide
 - (D) pyruvic acid
 - (E) lactic acid
50. Natural selection is an evolutionary force that can affect an entire population. One species can evolve into two species when only the extreme forms of a trait are favored and intermediate forms are selected against. This is known as
- (A) artificial selection
 - (B) directional selection
 - (C) targeted selection
 - (D) disruptive selection
 - (E) stabilizing selection
51. An example of a density-dependent factor is
- (A) weather
 - (B) climate
 - (C) air
 - (D) food
 - (E) drought
52. Which best describes the advantage of crossing over during meiosis?
- (A) makes for healthy offspring
 - (B) provides a source of genetic variation
 - (C) creates a random mix of chromosomes
 - (D) allows gametes to have half the number of chromosomes
 - (E) increases the number of gametes
53. A segment of a DNA molecule that carries instructions for a specific trait is called a
- (A) gene
 - (B) chromosome
 - (C) nucleotide
 - (D) codon
 - (E) chromatid
54. Small, round bacteria that grow in a chain are called
- (A) streptococci
 - (B) staphylobacilli
 - (C) spirillum
 - (D) diplococci
 - (E) bacillus
55. According to Darwin, organisms best suited to their environment
- (A) are most likely to evolve
 - (B) are more likely to survive and reproduce
 - (C) are most likely to live the longest
 - (D) are the fastest organisms
 - (E) have the same chance of survival as other organisms
56. When lions and hyenas fight over a dead zebra, their interaction is called
- (A) mutualism
 - (B) competition
 - (C) commensalism
 - (D) parasitism
 - (E) predation



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PRACTICE TEST—Continued

57. Which is the best method for preserving the biodiversity of an ecosystem?
- (A) creating a preserve in an urban area
 - (B) building botanical gardens based on the ecosystem
 - (C) preserving a few very large areas on an ecosystem
 - (D) preserving many small areas of an ecosystem
 - (E) creating greenbelts along creeks and roadways in urban areas
58. Gregor Mendel found that the inheritance of one trait had no effect on the inheritance of different trait. He described this observation as the
- (A) law of dominance
 - (B) law of universal inheritance
 - (C) law of segregation
 - (D) law of independent assortment
 - (E) law of separate chromosomes
59. Meiosis is the process of making sex cells or gametes. In humans, how many mature egg cells result from meiosis?
- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
 - (E) 6
60. Which of the following are considered prokaryotes?
- (A) animals
 - (B) plants
 - (C) fungi
 - (D) protists
 - (E) bacteria



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PRACTICE TEST—*Continued***PART B (Biology-E Questions 61–80)**

61. Which represents the correct order from simplest to most complex?
- (A) organ system, organ, tissue, cell
 - (B) cell, tissue, organ, organ system
 - (C) tissue, cell, organ, organ system
 - (D) cell, organ, tissue, organ system
 - (E) cell, organ, organ system, tissue
62. Which property of a population may be described as even, clumped, or random?
- (A) habitat
 - (B) dispersion
 - (C) size
 - (D) density
 - (E) growth rate
63. The process of evolution where an ancestral species evolves into an array of species that occupy different niches is called
- (A) gradualism
 - (B) convergent evolution
 - (C) adaptive radiation
 - (D) punctuated equilibrium
 - (E) divergent evolution
64. Natural selection is often described as survival of the fittest. Which of the following species would likely be best able to survive in rapidly changing environmental conditions?
- (A) a tree that takes 20 years to reach maturity and produces thousands of seeds
 - (B) a weed that only lives one year and produces hundreds of seeds
 - (C) a mouse that reproduces six to eight times a year with a litter of six mice
 - (D) a bird that reproduces once a year but lays four to six eggs
 - (E) a tree that lives for more than 500 years and produces many slow growing seeds
65. Bryophytes are nonvascular plants. In which of the following habitats would you most likely find bryophytes growing?
- (A) in a desert
 - (B) on the top of a high tree
 - (C) in a cave
 - (D) under the soil
 - (E) at the mouth of a spring
- 66.
- I. temperature
 - II. humidity
 - III. vegetation
- Which of the above are abiotic factors?
- (A) I only
 - (B) II only
 - (C) III only
 - (D) I and II only
 - (E) I, II, and III
67. When energy is transferred from one trophic level to the next, about 90% of the energy is lost. If plants produce 1,000 kcal of energy, how much of the energy is passed to the next trophic level?
- (A) 10,000 kcal
 - (B) 1,000 kcal
 - (C) 100 kcal
 - (D) 10 kcal
 - (E) 1 kcal
68. Which main factor(s) determine(s) which biome exists in a certain area?
- (A) temperature
 - (B) elevation
 - (C) precipitation
 - (D) temperature and moisture
 - (E) temperature and elevation

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PRACTICE TEST—Continued

Questions 69–74

Some Land (Terrestrial) Biomes:

Biome	Water	Temperature	Soil	Plants	Animals
<u>Desert</u>	Almost none	Hot or cold	Poor	Sparse—succulents (like cactus), sage brush	Sparse—insects, arachnids, reptiles and birds (often nocturnal)
<u>Chaparral</u> (<u>scrub</u>)	Dry summer, rainy winter	Hot summer, cool winter	Poor	Shrubs, some woodland (like scrub oak)	Drought and fire- adapted animals
<u>Tundra</u>	Dry	Cold	Permafrost (frozen soil)	Lichens and mosses	Migrating animals
<u>Taiga</u> (<u>coniferous</u> <u>forest</u>)	Adequate	Cool year around	Poor, rocky soil	Conifers	Many mammals, birds, insects, arachnids, etc.
<u>Temperate</u> <u>deciduous</u> <u>forest</u>	Adequate	Cool season and warm season	Fertile soil	Deciduous trees	Many mammals, birds, reptiles, insects, arachnids, etc.
<u>Grassland</u>	Wet season, dry season	Warm to hot (often with a cold season)	Fertile soil	Grasses (few or no trees)	Many mammals, birds, insects, arachnids, etc.
<u>Tropical rain</u> <u>forest</u>	Very wet	Always warm	Poor, thin soil	Many plants	Many animals
<u>Swamp</u>	Very wet	Warm	Nutrient-rich soil	Many plants	Many animals
<u>Cave</u> (<u>terrestrial</u>)	Variable	Cool (and dark)	Rocks	Almost no plants	Few animals
Biome	Water	Temperature	Soil	Plants	Animals

69. A biome that is characterized by warm temperatures throughout the year and seasonal heavy rainfall is found in the
- (A) temperate deciduous forest
 - (B) taiga
 - (C) tundra
 - (D) tropical rain forest
 - (E) savannah

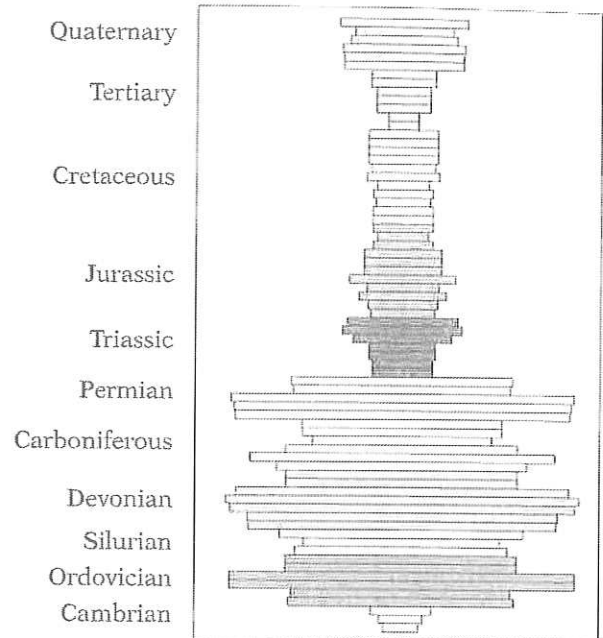

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PRACTICE TEST—Continued

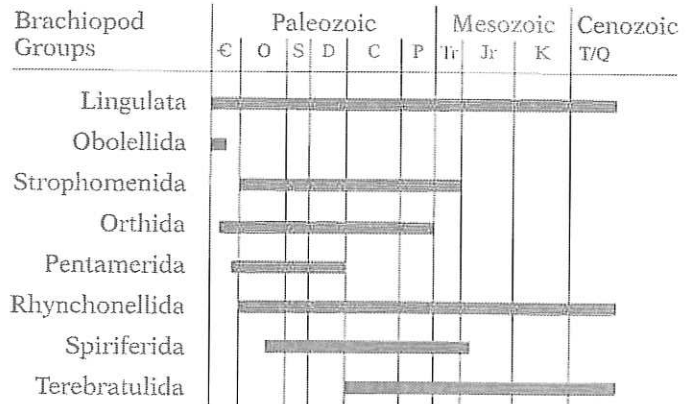
70. Which pair of biomes would most likely be found adjacent to each other?
- (A) temperate deciduous forest—taiga
 - (B) taiga—tundra
 - (C) tundra—swamp
 - (D) tropical rain forest—deciduous forest
 - (E) chaparral—tundra
71. Which describes the change you most likely see when moving from the equator toward the North Pole?
- (A) tropical rain forests→deserts→taiga
 - (B) tundra→deserts→grasslands
 - (C) grasslands→tundra→rainforests
 - (D) temperate deciduous forests→taiga→rain forests
 - (E) tropical rainforest→taiga→grasslands→tundra
72. Which biome produces much of our wheat crop?
- (A) taiga
 - (B) grassland
 - (C) chaparral
 - (D) tropical rain forest
 - (E) temperate deciduous forest
73. Which two biomes are most similar in annual rainfall?
- (A) taiga and tundra
 - (B) taiga and grassland
 - (C) grassland and tropical rain forest
 - (D) taiga and temperate deciduous forest
 - (E) tundra and grassland
74. The biome that has the highest biodiversity is the
- (A) temperate deciduous forest
 - (B) taiga
 - (C) tundra
 - (D) savannah
 - (E) tropical rain forest

Questions 75–77

This chart shows the number of genera of brachiopods, a type of mollusk, throughout geologic time. Brachiopods were once numerous but today they are rare. They resemble clams but they are very different in form and structure. Most of the brachiopods living today are found in very cold waters or in the deep ocean. Brachiopods are very important to paleontologists because they give information about both time sequence and past environmental conditions.



Width of Bars Is Proportional to the Number of Genera Known from Each Geologic Time Period



75. During which of the following times did a mass extinction occur?
- (A) Cambrian–Ordovician
 - (B) Silurian–Devonian
 - (C) Permian–Triassic
 - (D) Jurassic–Cretaceous
 - (E) Tertiary–Quaternary

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PRACTICE TEST—Continued

76. During which period of time was there a population explosion of species?
- (A) Cambrian–Ordovician
 (B) Silurian–Devonian
 (C) Permian–Triassic
 (D) Jurassic–Cretaceous
 (E) Tertiary–Quaternary
77. A paleontologist finds a rock unit with *Strophomenida*, *Spiriferida*, and *Pentamerida* brachiopods. Which of the following times is the rock unit most likely from?
- (A) Cambrian
 (B) Silurian
 (C) Triassic
 (D) Cretaceous
 (E) Tertiary

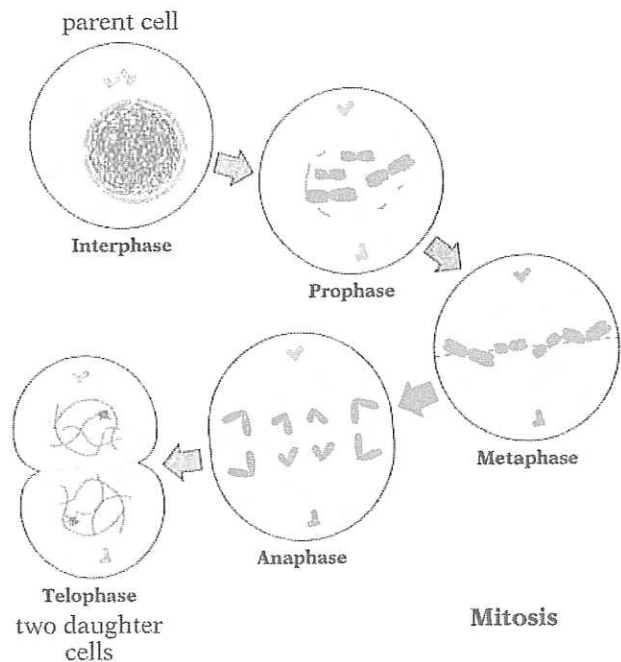
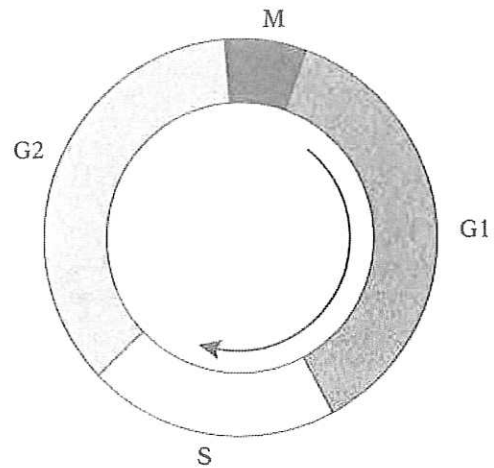
Questions 78–80

The diagram represents the events of the cell cycle:

- 78.
- I. mitosis
 - II. G1 phase
 - III. S phase

Which phase of the cell cycle involves DNA replication?

- (A) I only
 (B) II only
 (C) III only
 (D) I and III only
 (E) I, II, and III
79. During which phase of mitosis do the chromosomes uncoil at opposite ends of the cell followed by the formation of the nuclear membrane?
- (A) interphase
 (B) prophase
 (C) metaphase
 (D) anaphase
 (E) telophase
80. During which phase of mitosis do the chromosomes begin condensing and become visible?
- (A) interphase
 (B) prophase
 (C) metaphase
 (D) anaphase
 (E) telophase



S T O P

IF YOU FINISH BEFORE TIME RUNS OUT, GO BACK AND CHECK YOUR WORK.