Bio12-Q3W4-Fish-Amphibians-Qs.Bank

True/False
Indicate whether the statement is true or false.

____ 1. Ancestral amphibians appeared on Earth about the same time as ancestral fishes.

____ 2. Amphibians probably evolved from tetrapods during the Paleozoic Era.

____ 3. Because the climate was hot and dry when amphibians first appeared on Earth, they had to stay near water.

____ 4. Like present-day salamanders, early amphibians probably had legs set at right angles to the body.

____ 5. Because amphibians were a transitional group, they never were the dominant vertebrates on land.

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 6. Early amphibians needed large amounts of food and oxygen to
a. walk on land.
b. breathe on land.
c. become dormant in cold weather.
d. all of these.

____ 7. In many amphibians, the most important organ for gas exchange is the
a. blood.
b. skin.
c. lungs.
d. circulatory system.

____ 8. Many frogs and toads use ____ as a defense against predators.
a. toxins
b. electricity
c. sharp claws
d. all of these

____ 9. Frogs and toads have sound-producing bands of tissues in their throat called
a. tongues.
b. vocal cords.
c. vocal tissue.
d. none of these.

____ 10. Salamanders are unlike frogs and toads because they have
a. long, slender bodies.
b. tails.
c. necks.
d. all of these.

____ 11. Caecilians are amphibians that have no
a. eyes.
b. skin.
c. limbs.
d. heart.

____ 12. Bony fishes belong to the class _____.
a. Agnatha
b. Osteichthyes
c. Amphibia
d. Chondrichthyes

____ 13. Scientists hypothesize that amphibians evolved from _____.
a. sharks
b. tetrapods
c. lampreys
d. salmon

____ 14. Frogs have a tympanic membrane that _____.
a. allows water to pass into cells
b. picks up vibrations from water or air and transmits them to the inner ear
c. protects cells from harmful chemicals
d. allows nutrients to enter the body

____ 15. Fishes have great flexibility when they swim because they have _____.
a. separate vertebrae
c. scales

b. no limbs
d. no skin

____ 16. A fish can detect movement and vibrations in the water by means of its _____.
a. keen sense of smell
c. excellent vision
b. scales
d. lateral line system

____ 17. Lampreys are parasites that attach themselves to other fishes by suckerlike mouths and they use their _____ to scrape away the flesh.
a. teeth
c. jaws
b. fins
d. a skeleton

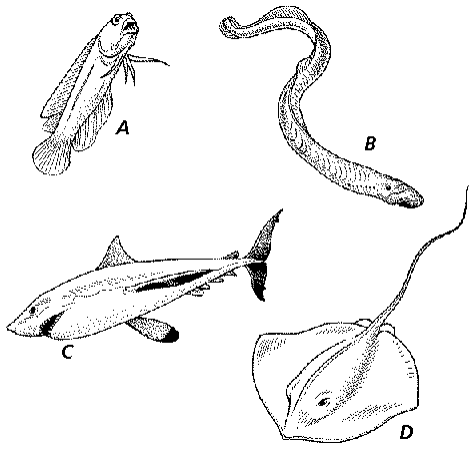

Figure 30-1

____ 18. What is the major classification between fish A and fish B in Figure 30-1?
a. one uses gills
c. one has a jaw
b. one is a parasite
d. one has a two-chambered heart

____ 19. Which fish in Figure 30-1 has bones?
a. A
c. C
b. B
d. D

____ 20. Which fish in Figure 30-1 was the earliest to evolve?
a. A
c. C
b. B
d. D

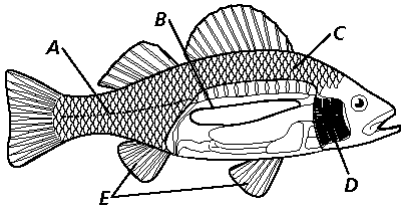

Figure 30-2

____ 21. Which structure pictured in Figure 30-2 is analogous to your lungs?
a. A
c. C
b. B
d. D

____ 22. Which structure pictured in Figure 30-2 aids a fish in floating?
a. A
c. C
b. B
d. D

____ 23. Which structure pictured in Figure 30-2 allows a shark to feel vibrations of a struggling fish several hundred yards away?

a. A
b. B
c. C
d. D

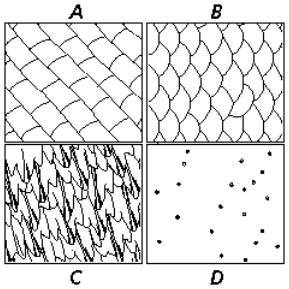

Figure 30-3

____ 24. Which illustration in Figure 30-3 depicts the close-up of a hagfish's exterior?

a. A
b. B
c. C
d. D

____ 25. Which illustration in Figure 30-3 is characteristic of a shark?

a. A
b. B
c. C
d. D

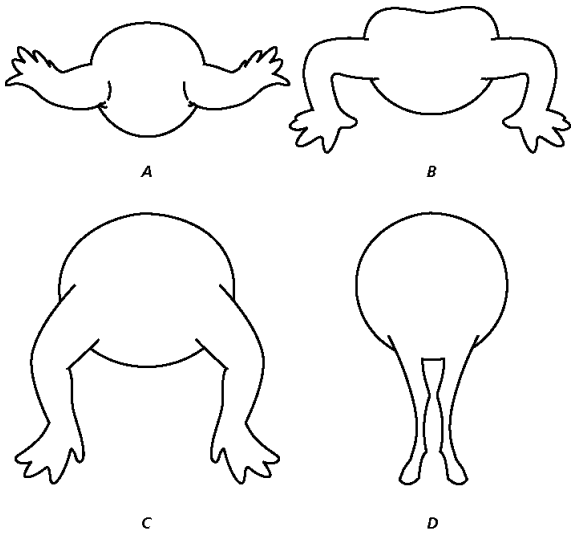

Figure 30-4

____ 26. Which appendages shown in Figure 30-4 belong to the earliest animals to set foot on land?

a. A
b. B
c. C
d. D

____ 27. Which appendages shown in Figure 30-4 are most likely from an organism that lives almost exclusively on land?

a. A
b. B
c. C
d. D

____ 28. What is the general progression of evolution from A to D in Figure 30-4?

a. thinner legs were needed to stand in water
b. legs moved under the body to hold the animal off the ground

c. stronger legs were needed in order to swim
d. the legs made it easier to move in a warm, wet climate

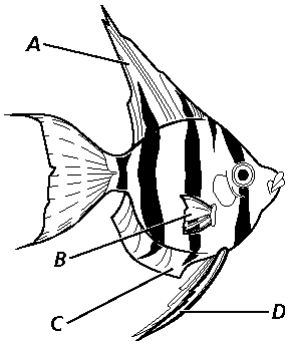

Figure 30-5

____ 29. Which is the dorsal fin in Figure 30-5?
a. A
b. B
c. C
d. D

____ 30. Which is the pectoral fin in Figure 30-5?
a. A
b. B
c. C
d. D

____ 31. Which fin shown in Figure 30-5 is not in a pair?
a. A
b. B
c. C
d. D

Matching

Match each item with the correct statement below.

a. two-chambered
b. three-chambered
c. skin
d. tadpoles
e. ectotherms

____ 32. Adult frogs and toads have legs, lungs, and a ____ heart.
____ 33. Tadpoles have gills, fins, and a ____ heart.
____ 34. Amphibians are ____, animals whose body temperature changes with the temperature of their surroundings.
____ 35. Fertilized amphibian eggs hatch into ____ during the aquatic phase of their life.
____ 36. Some salamanders have no lungs and breathe through their ____.

Completion
Complete each statement.

37. All vertebrates are in the phylum _____, and fish, amphibians, reptiles, birds, and mammals are in the subphylum _____.
38. Vertebrates are bilaterally symmetrical, coelomate animals with endoskeletons, closed _____ systems, complex _____, and efficient _____ systems.
39. If you compared the number of fish species to the number of all other vertebrate species combined, there would be more species of _____.
40. Fishes depend on their _____ for balance, steering, and swimming. These structures are fan-shaped membranes supported by stiff spines.
41. External fertilization in fishes is called _____.
42. The _____ of a fish can be toothlike, diamond-shaped, cone-shaped, or round. These structures are made of bone formed from the skin.
43. Frogs and toads have bands of tissue in their throats called _____, which are capable of producing a wide range of sounds.
44. Amphibians are _____ because their body temperature changes with the temperature of the surroundings.
45. The skeletons of lampreys, hagfishes, and sharks are made of a tough, flexible material called _____.
46. Many bony fishes possess a(n) _____, which is a thin-walled, internal sac found just below the backbone. By altering the gas pressure in this structure, a fish can control its depth in the water.
47. All classes of fishes possess a(n) _____, composed of fluid-filled canals arranged along the sides of the body, which permit them to detect movement and vibrations in the water.
48. _____ are fishes characterized by lobelike, fleshy fins and were thought to be extinct until one was caught in 1938.
49. Catfish, perch, salmon, and cod are members of the _____ subclass of fishes.
50. Scientists hypothesize that the _____ were directly ancestral to amphibians, the first land vertebrates.
51. The heart of a fish pushes most blood through the _____.
52. The activity level of amphibians requires more oxygen, which is supplied by a(n) _____.
53. Having _____ gave early fishes an advantage because it allowed them to grasp and crush their prey.
54. The cartilaginous and bony fishes possibly evolved from ancient armored fish called _____.
55. In amphibians, the _____ is the most important organ of gas exchange.
56. Amphibians live mostly in regions that have warm temperatures because they are ectotherms whose body temperatures change with the temperature of the _____.

57. Sharks have _____ fertilization.
58. Blood flow in fishes is slow because most of the pumping action is used to push blood through the _____.
59. Fishes have a _____-chambered heart.

Essay

60. How does a fish breathe through its gills?
61. What two adaptations of cartilaginous and bony fishes help them to locate food?
62. What three orders make up the class Amphibia?
63. Why do amphibian eggs need to be laid in water?
64. Where does an amphibian heart pump oxygen-rich blood, and where does it pump oxygen-poor blood?

Short Answer

65. What adaptation made placoderms successful predators?
66. What important characteristic did the ostracoderms possess?
67. How does the three-chambered heart equip amphibians for life on land?
68. What were the advantages for early amphibians to live on land? What were the disadvantages of living on land?
69. What is the purpose of the swim bladder in bony fishes?
70. How does blood circulate in a fish?
71. Why was the evolution of jaws an important event in vertebrate history?
72. Removing the thyroid gland from a tadpole will prevent it from undergoing metamorphosis. If the gland is reimplanted, the tadpole will then undergo metamorphosis. Make a hypothesis to explain this observation.
73. In what way does metamorphosis in frogs represent a shortened version of evolution that took place over countless generations?
74. How might being able to jump have been a factor in the success of frogs on land?

Problem

Many investigators would like to know whether sleep has an adaptive function. Some of the studies of sleep focus on fishes. Do fishes sleep? Although fishes cannot close their eyes because they lack eyelids, they do remain immobile in the same position and location for a period of time. At these times, the fishes are in a state of decreased sensitivity to disturbances. To an investigator, this means they are asleep. There are other signs, such as decreased rate of respiration, decreased reaction to sound, and a lessened response to the approach of a foreign object, that are indicative of sleep.

75. One nocturnal fish, the *Tinca tinca,* has been recorded as lying at the bottom of the fish tank for periods of 15-20 minutes during the day without moving. Their respiratory rates at that time are reduced to 65 percent of the nocturnal rate. What would you expect to happen to the respiratory rates of the *Tinca tinca* if lights were left on at night and the tank were darkened during the day?

76. What kind of correlation would you expect to find between any of the variables that you test and the depth of sleep, or degree of insensitivity to disturbances?

77. What will be the control in this investigation?

78. What will be the variable in this investigation?

79. Plan an experiment to prove that fishes sleep. Because 24-hour observations are not feasible, you may want your plan to include recordings by infrared videos, electromechanical sensors, ultrasound telemetry, or infrared photo cells. Another approach might be to change the fishes' sleep patterns by reversing the patterns of light and darkness during a 24-hour period. You could then monitor oxygen consumption as an indicator of the level of the fishes' activity. Make sure that there is a shelter for the fishes to go to during the rest phase. Not all fishes use a shelter, but many do.

80. Hypothesize as to the adaptive value of sleep for fishes.

Bio12-Q3W4-Fish-Amphibians-Qs.Bank
Answer Section

TRUE/FALSE

1. ANS: F PTS: 1
2. ANS: T PTS: 1
3. ANS: F PTS: 1
4. ANS: T PTS: 1
5. ANS: F PTS: 1

MULTIPLE CHOICE

6. ANS: A PTS: 1
7. ANS: B PTS: 1
8. ANS: A PTS: 1
9. ANS: B PTS: 1
10. ANS: D PTS: 1
11. ANS: C PTS: 1
12. ANS: B PTS: 1 DIF: B OBJ: 30-2
    NAT: C3 | F4 | F5
13. ANS: B PTS: 1 DIF: B OBJ: 30-3
    NAT: C3
14. ANS: B PTS: 1 DIF: B OBJ: 30-3
    NAT: C3
15. ANS: A PTS: 1 DIF: B OBJ: 30-1
    NAT: C3 | F4 | F5
16. ANS: D PTS: 1 DIF: B OBJ: 30-1
    NAT: C3 | F4 | F5
17. ANS: A PTS: 1 DIF: B OBJ: 30-2
    NAT: C3 | F4 | F5
18. ANS: C PTS: 1 DIF: A OBJ: 30-1
    NAT: C3 | F4 | F5
19. ANS: A PTS: 1 DIF: B OBJ: 30-1
    NAT: C3 | F4 | F5
20. ANS: B PTS: 1 DIF: A OBJ: 30-3
    NAT: C3
21. ANS: D PTS: 1 DIF: A OBJ: 30-3
    NAT: C3
22. ANS: B PTS: 1 DIF: A OBJ: 30-3
    NAT: C3
23. ANS: A PTS: 1 DIF: A OBJ: 30-3
    NAT: C3
24. ANS: D PTS: 1 DIF: A OBJ: 30-2
    NAT: C3 | F4 | F5
25. ANS: C PTS: 1 DIF: A OBJ: 30-2

NAT: C3 | F4 | F5

26. ANS: A PTS: 1 DIF: A OBJ: 30-4
NAT: C3 | C5 | C6

27. ANS: D PTS: 1 DIF: A OBJ: 30-4
NAT: C3 | C5 | C6

28. ANS: B PTS: 1 DIF: A OBJ: 30-4
NAT: C3 | C5 | C6

29. ANS: A PTS: 1 DIF: B OBJ: 30-1
NAT: C3 | F4 | F5

30. ANS: B PTS: 1 DIF: B OBJ: 30-1
NAT: C3 | F4 | F5

31. ANS: C PTS: 1 DIF: A OBJ: 30-1
NAT: C3 | F4 | F5

MATCHING

32. ANS: B PTS: 1
33. ANS: A PTS: 1
34. ANS: E PTS: 1
35. ANS: D PTS: 1
36. ANS: C PTS: 1

COMPLETION

37. ANS: Chordata, Vertebrata

PTS: 1

38. ANS: circulatory, brains, respiratory

PTS: 1

39. ANS: fishes

PTS: 1

40. ANS: fins

PTS: 1 DIF: B OBJ: 30-1 NAT: C3 | F4 | F5

41. ANS: spawning

PTS: 1 DIF: B OBJ: 30-1 NAT: C3 | F4 | F5

42. ANS: scales

PTS: 1 DIF: B OBJ: 30-1 NAT: C3 | F4 | F5

43. ANS: vocal cords

PTS: 1 DIF: B OBJ: 30-3 NAT: C3

44. ANS: ectotherms

PTS: 1 DIF: B OBJ: 30-3 NAT: C3

45. ANS: cartilage

PTS: 1 DIF: B OBJ: 30-2 NAT: C3 | F4 | F5

46. ANS: swim bladder

PTS: 1 DIF: B OBJ: 30-1 NAT: C3 | F4 | F5

47. ANS: lateral line system

PTS: 1 DIF: B OBJ: 30-1 NAT: C3 | F4 | F5

48. ANS: Coelacanths

PTS: 1 DIF: B OBJ: 30-2 NAT: C3 | F4 | F5

49. ANS: ray-finned

PTS: 1 DIF: B OBJ: 30-2 NAT: C3 | F4 | F5

50. ANS: aquatic tetrapod

PTS: 1 DIF: B OBJ: 30-3 NAT: C3

51. ANS: gills

PTS: 1 DIF: B OBJ: 30-4 NAT: C3 | C5 | C6

52. ANS: three-chambered heart

PTS: 1 DIF: B OBJ: 30-4 NAT: C3 | C5 | C6

53. ANS: jaws

PTS: 1 DIF: B OBJ: 30-1 NAT: C3 | F4 | F5

54. ANS: placoderms

PTS: 1 DIF: B OBJ: 30-2 NAT: C3 | F4 | F5

55. ANS: skin

PTS: 1 DIF: B OBJ: 30-3 NAT: C3

56. ANS: surroundings

PTS: 1 DIF: B OBJ: 30-3 NAT: C3

57. ANS: internal

PTS: 1 DIF: B OBJ: 30-2 NAT: C3 | F4 | F5

58. ANS: gills

PTS: 1 DIF: B OBJ: 30-1 NAT: C3 | F4 | F5

59. ANS: two

PTS: 1 DIF: B OBJ: 30-1 NAT: C3 | F4 | F5

ESSAY

60. ANS:

A fish takes in water through its mouth and then passes the water over capillary-rich gills and out through slits on the side of its body. Oxygen and carbon dioxide are exchanged through the capillaries.

PTS: 1

61. ANS:
These fishes have an excellent sense of smell and can detect movement and vibrations in the water through their lateral line systems.

PTS: 1

62. ANS:
The three orders are Caudata, Anura, and Apoda.

PTS: 1

63. ANS:
The eggs lack protective membranes and shells. Water is necessary to keep them from drying out and to transport sperm.

PTS: 1

64. ANS:
Oxygen-rich blood is pumped to body tissues, and oxygen-poor blood is pumped to the lungs and skin.

PTS: 1

SHORT ANSWER

65. ANS:
Placoderms had jaws so they could eat a wide variety of food items.

PTS: 1 DIF: A OBJ: 30-1 NAT: C3 | F4 | F5

66. ANS:
The development of bone was an important evolutionary step. Bone provides a place for muscle attachment, which improves locomotion.

PTS: 1 DIF: A OBJ: 30-2 NAT: C3 | F4 | F5

67. ANS:
Moving about on land requires a great deal of energy from food and large amounts of oxygen for aerobic respiration. The evolution of the three-chambered heart provided an increased supply of oxygen to cells.

PTS: 1 DIF: A OBJ: 30-4 NAT: C3 | C5 | C6

68. ANS:
Advantages: life on land provided a large food supply, shelter, and no predators. There was also more oxygen in air than in water. Disadvantages: temperatures varied much more on land than in water. Also, without the support of water, bodies were clumsy and heavy.

PTS: 1 DIF: A OBJ: 30-3 NAT: C3

69. ANS:
The swim bladder can be filled with gases that diffuse out of a fish's blood. Fishes can control their depth by regulating the amount of gas in the bladder.

PTS: 1 DIF: A OBJ: 30-2 NAT: C3 | F4 | F5

70. ANS:
A fish has a two-chambered heart. One chamber receives deoxygenated blood from the body tissues, whereas the second chamber pumps blood directly to the capillaries of the gills. There, oxygen is picked up and carbon dioxide is released. Oxygenated blood is carried from the gills to the body tissues.

PTS: 1 DIF: A OBJ: 30-1 NAT: C3 | F4 | F5

71. ANS:
The jaw enables an animal to grasp and crush its prey with great force, increasing the possibilities of obtaining food.

PTS: 1 DIF: A OBJ: 30-1 NAT: C3 | F4 | F5

72. ANS:
The thyroid gland must secrete a chemical (hormone) that must be present for metamorphosis to occur.

PTS: 1 DIF: A OBJ: 30-3 NAT: C3

73. ANS:
Evolution from fish to amphibian required the development of limbs for walking on land and lungs for breathing in air. This same process occurs during metamorphosis when the fishlike tadpole develops lungs, loses its gills, and develops a three-chambered heart from a two-chambered heart. At the same time, the tadpole absorbs its tail and develops limbs for locomotion on land.

PTS: 1 DIF: A OBJ: 30-3 NAT: C3

74. ANS:
The early amphibians moved like the modern-day salamanders. The ability to jump was an advantage in escaping predation and also in capturing food.

PTS: 1 DIF: A OBJ: 30-3 NAT: C3

PROBLEM

75. ANS:
The respiratory rates would rise during the day and be lowered at night.

PTS: 1 DIF: A OBJ: 30-1 NAT: C3 | F4 | F5

76. ANS:
Answers will *vary* but students may find that a fish that is in deep sleep can be touched or lifted by hand without evoking a response.

PTS: 1 DIF: A OBJ: 30-1 NAT: C3 | F4 | F5

77. ANS:
Answers may vary. The control will most likely be the normal patterns of rest.

PTS: 1 DIF: A OBJ: 30-1 NAT: C3 | F4 | F5

78. ANS:
Answers will vary according to which indicators of sleep will be monitored in the investigation.

PTS: 1 DIF: A OBJ: 30-1 NAT: C3 | F4 | F5

79. ANS:

Plans will vary according to the method of observation.

PTS: 1 DIF: A OBJ: 30-1 NAT: C3 | F4 | F5

80. ANS:
Answers will vary. Students may hypothesize that sleep forces the fishes to become less sensitive to external stimuli and thus conserve energy. They may also suggest that sleep forces the fishes to find a safe shelter during the time of day when they are most vulnerable to predators.

PTS: 1 DIF: A OBJ: 30-1 NAT: C3 | F4 | F5