

## Chapter 2

### Multiple Choice

1. Which of the following statements about evolution is NOT correct?

- a. Evolution emerges from the close interaction of organisms with their environment.
- b. Evolution guides the organism toward better solutions to fundamental problems.
- c. Evolution leads to the development of new species and the extinction of others.
- d. Evolution results in heritable changes in a population over many generations.

Ans: b

2. Originally, all humans lived in hunter-gatherer societies, but by \_\_\_\_\_ years ago about half of all humans were engaged in some form of agriculture.

- a. 500
- b. 5,000
- c. 50,000
- d. 500,000

Ans: b

3. "How does the process of facial perception work?" is an example of a(n) \_\_\_\_\_ question.

- a. operative
- b. phylogenetic
- c. proximate
- d. ultimate

Ans: c

4. The fusiform face area (FFA), located in the \_\_\_\_\_ lobe, is a complex set of brain structures for making, recognizing, and discriminating between facial expressions.

- a. frontal
- b. occipital
- c. parietal
- d. temporal

Ans: d

5. The scientific principle of parsimony states that

- a. a hypothesis cannot be precise unless it is expressed mathematically.
- b. scientists should strive to remove all biases from their experiments.
- c. similar processes should be explained by the same fundamental principles.
- d. theories are not proven until they are tested in controlled laboratory settings.

Ans: c

6. When doing science, we must not only consider what evidence supports our hypothesis, we must also consider

- a. what evidence would be required to refute our hypothesis.
- b. what results other researchers have obtained.
- c. whether the evidence is of the right kind.
- d. whether the evidence was obtained in an ethical manner.

Ans: a

7. According to philosopher of science Thomas Kuhn, a paradigm refers to the

- a. evidence we gather and how we evaluate it.
- b. tests we perform and the methods we use.
- c. theories we propose and the hypotheses we test.
- d. topics we study and the questions we ask.

Ans: d

8. The present-day eye evolved from a structure that detected

- a. gross changes in light but not specific images and colors.
- b. regions of relative warmth or coldness.
- c. specific images but not changes in light or color.
- d. two-dimensional but not three-dimensional images.

Ans: a

9. Vestigial structures retain previous physiology that is

- a. adaptive but not functional.
- b. both adaptive and functional.
- c. neither adaptive nor functional.
- d. not adaptive but is functional.

Ans: c

10. \_\_\_\_\_ independently developed a theory of evolution similar to Darwin's.

- a. Alfred Wallace
- b. Gregor Mendel
- c. Richard Dawkins
- d. Thomas Kuhn

Ans: a

11. During Darwin's voyage on the *Beagle*, his thinking was greatly influenced by

- a. James' *Principles of Psychology*.

- b. Lyell's *Principles of Geology*.
- c. Malthus' *Principle of Population*.
- d. Spencer's *Principles of Biology*.

Ans: b

12. What amazed Darwin about the Galápagos Islands was the
- a. number of new plant and animal species.
  - b. similar of species there to those in Europe.
  - c. wide variety of fish species.
  - d. white cliffs created by small volcanic eruptions.

Ans: a

13. Which of the following was NOT something Darwin discovered on the Galápagos Islands?
- a. Birds on one of the islands were different from those on the other islands.
  - b. Different species occupied identical habitats on the east and west sides of an island.
  - c. Some 100 new species of flowering plants existed only on these islands.
  - d. The people on these islands were well adapted to their environment.

Ans: d

14. Darwin's thinking began with the assumption that
- a. acquired characteristics are passed on to offspring.
  - b. heritable variations can and do occur in nature.
  - c. organisms contain an inner drive to improve over time.
  - d. the number of species remains constant over time.

Ans: b

15. Darwin's idea of natural selection was inspired by his observations of
- a. human mating preferences.
  - b. plant and animal breeders.
  - c. reproductive behaviors in birds.
  - d. various species around the world.

Ans:

16. The biological concept of *species* is defined as a group that
- a. bears distinct characteristics that make it different from other groups.
  - b. has a unique feature shared by all members of the group by not by any other groups.
  - c. only breeds among the group and does not seek to breed with other groups.
  - d. shares a unique ecological niche not exploited by any other groups.

Ans: c

17. The term *adaptive radiation* refers to the situation in which

- a. cosmic radiation results in adaptive mutations.
- b. multiple species come to occupy the same habitat.
- c. one species develops into multiple species.
- d. species A drives other species B from its habitat.

Ans: c

18. In addition to natural selection, Darwin proposed that species could evolve through \_\_\_\_\_ selection.

- a. artificial
- b. habitat
- c. kin
- d. sexual

Ans: d

19. Through the process of adaptation, organisms will

- a. appear to fit closely with their environment.
- b. become more and more similar to each other.
- c. seek new environments to exploit.
- d. take on the characteristics of their parents.

Ans: a

20. For Darwin, humans and other animals differed

- a. behaviorally but not physiologically.
- b. both physically and mentally.
- c. only in degree of functioning.
- d. to a greater degree than expected.

Ans: c

21. Decartes argued that humans and animals

- a. expressed similar emotions.
- b. varied only in degree of functioning.
- c. were biologically similar.
- d. were qualitatively different.

Ans: d

22. Morgan's Canon directs that scientific explanations should be as \_\_\_\_\_ as possible.

- a. complex

- b. elegant
  - c. far-reaching
  - d. simple
- Ans: d

23. Galton laid the groundwork for the future study of

- a. animal intelligence and reasoning.
- b. individual differences in ability.
- c. the mechanisms of heredity.
- d. sexual selection in primates.

Ans: b

24. The biogenetic law, stated as “ontogeny recapitulates phylogeny,” means that \_\_\_\_\_ can be seen as paralleling the evolutionary history of the species.

- a. changes over the lifespan
- b. development from conception
- c. related species
- d. the range of abilities in a group

Ans: b

25. Sigmund Freud incorporated Darwin’s emphasis on instinct into his work, but he emphasized \_\_\_\_\_ over \_\_\_\_\_.

- a. genetics, environment
- b. sexual selection, natural selection
- c. mutation, adaptation
- d. phylogeny, ontogeny

Ans: b

26. Jung’s idea of the collective unconscious reflects the manner in which the expressive predispositions of current-day humans are the result of

- a. evolutionary pressures on our ancestors.
- b. multiple interactions in modern society.
- c. repeated exposure to mass media.
- d. sympathetic and empathetic processes.

Ans: a

27. William James was particularly interested in the \_\_\_\_\_ aspects of psychological processes.

- a. behavioral
- b. functional

- c. physiological
  - d. structural
- Ans: b

28. William James disagreed with other scholars of his day in his belief that humans had \_\_\_\_\_ instincts than other animals.

- a. far fewer
- b. far more
- c. more complex
- d. simpler

Ans: b

29. Watson argued that the proper study of psychology was

- a. behavior.
- b. consciousness.
- c. development.
- d. emotion.

Ans: a

30. Skinner suggested that such concepts as freedom, will, dignity, and other concepts referring to the mind or internal states.

- a. are irrelevant to modern life.
- b. belong to the collective consciousness.
- c. have no explanatory value.
- d. should be studied behaviorally.

Ans: c

### Short Answer (15-20)

1. \_\_\_\_\_ is a process that results in heritable changes in a population over many generations.

Ans: Evolution

2. "Why do peacocks have colorful tails?" is an example of a(n) \_\_\_\_\_ question.

Ans: ultimate

3. Kuhn pointed out that, at different periods in the history of science, some questions are overemphasized and others ignored; he called the topics we study and the types of questions we ask a(n) \_\_\_\_\_.

Ans: paradigm

4. Evolution by natural selection can only work when there is \_\_\_\_\_, giving some organisms a survival and reproductive advantage over others.

Ans: variation

5. The manner in which males and females choose to mate is known as \_\_\_\_\_, and this is also an important factor in evolution.

Ans: sexual selection

6. The best-fit line through the values on a scatter plot is called a(n) \_\_\_\_\_.

Ans: regression line

7. For Freud, the sexual \_\_\_\_\_ was the major driving force for human life and interaction.

Ans: instinct

8. The tendency for ideas that are presented together in time to be mentally called forth together is known as \_\_\_\_\_.

Ans: associationism

9. Freud believed the nervous system was capable of retaining and discharging a type of energy he called \_\_\_\_\_.

Ans: libido *or* sexual energy

10. In Freud's theory, \_\_\_\_\_ refers to the ability of higher cognitive functions to inhibit the experience of lower ones.

Ans: repression

11. According to Jung, the \_\_\_\_\_ reflects the manner in which the expressive predispositions of current-day humans are the result of evolutionary pressures on our ancestors.

Ans: collective unconscious

12. Jung referred to the universal patterns of thought that are available to all humans as \_\_\_\_\_.

Ans: archetypes

13. In response to those who said humans were different from other animals in that they lacked instincts, James replied, "Man has a far greater variety of \_\_\_\_\_ than any lower animal."

Ans: impulses

14. Watson said the proper study of psychology was \_\_\_\_\_ and not the mind.

Ans: behavior

15. Skinner developed a process of shaping behavior through reinforcement is known as \_\_\_\_\_.

Ans: operant conditioning

16. Prior to 10,000 years ago, there was no agriculture, and all humans lived in \_\_\_\_\_ societies.

Ans: hunter-gatherer

17. The \_\_\_\_\_, located in the temporal lobe, is a complex set of brain structures for making, recognizing, and discriminating between facial expressions.

Ans: fusiform face area or FFA

18. Newton suggested that the same forces that cause rocks to fall to the earth in England will also cause rocks to fall in Africa or Asia; this is an example of the scientific principle of \_\_\_\_\_.

Ans: parsimony

19. Organisms may retain previous physiology that is neither adaptive nor functional; these are called \_\_\_\_\_.

Ans: vestigial structures

20. What is the name of the ship that Darwin traveled to the Galápagos Islands on?

Ans: The *Beagle*.

## Essay

1. Trace the development of Darwin's thinking on evolution. Include a discussion of thinking on evolution in Darwin's time, the voyage of the *Beagle*, the influence of Lyell and Malthus, and the ideas of Wallace.

Ans:

- Evolution was actively discussed in Darwin's time, but its mechanism was unknown.



- The voyage of the *Beagle*, and especially his visit to the Galápagos Islands, exposed him to many new species, and he could observe how species were adapted to their environments
- Lyell argued that the structure of the earth changed over time; Darwin extended this thinking to living things.
- Malthus argued that populations increase faster than resources, creating competition; Darwin saw competition for survival as one driving force behind natural selection.
- Wallace independently developed a theory similar to Darwin's, but he was reluctant to extend it to humans, unlike Darwin.

2. The peppered moth in England is commonly used to illustrate natural selection in action. Explain.

Ans:

- Wing color ranges from light gray to almost black.
- Before industrial revolution in 1850s, most peppered moths were light, resembling the lichens on trees and hence camouflaged from predators.
- During industrial revolution, soot and pollutants darkened trees, and dark pepper moths became more numerous.
- With introduction of pollution controls after 1950s, lichens returned, trees lightened, and so did peppered moths.

3. Discuss the roles of natural selection and sexual selection in the evolution of species.

Ans:

- Natural selection: variation gives some individuals a survival advantage; these are more likely to reproduce and hence pass on those advantages to their offspring.
- Sexual selection: individuals within a species tend to display patterns of preference in the characteristics of mates, and these preferences shape the opposite sex. For example, peahens prefer peacocks with bright feathers.
- Sexual selection can explain evolution of traits that are not obviously advantageous for survival. For example, bright feathers make peacocks more visible to predators.

4. Discuss how Galton, Freud, Jung, and James extended Darwin's theory to the study of human cognitive processes.

Ans:

- Galton studied individual differences in intelligence and how it is inherited.
- Freud incorporated Darwin's emphasis on instincts in his theory of unconscious mental processes.
- Jung's collective unconscious resulted from evolutionary pressures on our ancestors.
- James was particularly interested in the functional aspects of psychological processes and how they evolved.

5. During the first half of the twentieth century, there was a movement in psychology away from evolutionary thinking. What was the dominant school of thought during this time, and who were its main proponents? Discuss their key ideas and those ideas ran counter to evolutionary thinking.

Ans:

- Behaviorism was the major school of psychology during the first half of the twentieth century.
- Watson argued that the proper study of psychology was behavior, not mind; he emphasized the influence of the environment in directing behavior.
- Skinner emphasized the role of reinforcement in shaping behavior, denied explanatory value of concepts like freedom, will, dignity and mind.
- Behaviorists viewed organisms as blank slates, emphasized the importance of environment and ignored any discussion of internal processes.