1. What roles did philosophy and physiology play in the development of psychology as an independent science?

2. How did Wilhelm Wundt and William James differ in their views of what psychology should study?

3. Discuss Charles Darwin's influence on William James and explain how Darwin's theory of evolution contributed to psychology.

4. What contributions did Mary Whiton Calkins and Margaret Floy Washburn make to psychology?

5. Discuss the achievements and contributions of Francis C. Sumner.

6. Who was Sigmund Freud, and what were the basic ideas of the school of psychological thought that he founded?

7. Compare and contrast psychoanalysis and behaviorism.

8. What roles did Ivan Pavlov, John B. Watson, and B. F. Skinner play in the founding of behaviorism?

9. What is humanistic psychology, and who introduced this approach?

10. List and describe the eight major perspectives in contemporary psychology described in the text. Be sure to address how each perspective differs in emphasis and approach.

11. Contrast the behavioral perspective with the cognitive perspective.

12. Which perspective in contemporary psychology was influenced by Carl Rogers and Abraham Maslow? What does this perspective focus on?

13. How do individualistic cultures differ from collectivistic cultures?

14. Evolutionary theory is based on the principle of natural selection. How does the evolutionary perspective relate to our understanding of human thought and behavior?

15. How do clinical psychologists differ from psychiatrists, and how are they similar?

16. Summarize the assumptions and attitudes that are held by psychologists.

17. List the steps in the scientific method.

18. Why is it important for psychologists to report their research findings?

19. How is a theory different from a hypothesis?

20. What strategies do pseudosciences often use in promoting their claims?

21. Describe the research method of naturalistic observation, and note some of its advantages.

22. Compare and contrast the naturalistic observation method and the case study method.

23. In a scientifically conducted survey, describe how participants should be selected and explain the importance of the selection process.

24. What do correlational studies examine, and what conclusions can be drawn from a correlational study?

25. Give an example of two factors that are positively correlated, and explain what that means.

26. What is the difference between a positive correlation and a negative correlation? Give an example of each.

27. What is the difference between the independent variable and the dependent variable?

28. Professor Rahn is conducting a study on the effects of caffeine on college students' study habits. His research question is: Will students who consume moderate doses of caffeine prior to studying perform better on an exam than students who do not consume any caffeine prior to studying? Professor Rahn randomly assigns students to one of two groups: One group is given two caffeinated beverages prior to studying, and the second group is given beverages without caffeine. Both groups of students believe they are consuming caffeinated beverages. According to research on experimental controls, what is the second group of participants receiving?

29. What is a natural experiment, and how does it differ from other research methods?

30. As a critical thinker, it is important to follow four steps when determining the validity of a particular claim presented in a research study. List the four steps.

31. Describe three commonly used brain-imaging techniques that are commonly used in psychological research.

32. Describe at least three of the APA ethical guidelines.

33. What are some of the reasons that psychologists use animals in research?

34. Your best friend is having difficulty in his Introduction to Psychology course. He scores low on tests and quizzes and wants to know how he can bring up his grade. According to Psych for Your Life, what are six research-based suggestions that will help your friend improve his performance in class?

Answer Key

1. The answer should include the following information: The earliest origins of psychology can be traced back several centuries to the writings of the great philosophers. More than 2,000 years ago, the Greek philosopher Aristotle wrote extensively about topics like sleep, dreams, the senses, and memory. Many of Aristotle's ideas remained influential until the seventeenth century when René Descartes, a French philosopher, came on the scene and proposed interactive dualism —the notion that the mind and body were separate but interacting entities that produced sensations, emotions, and other conscious experiences. Philosophers also laid the groundwork for the nature–nurture issue. Philosophers had debated which was more important: inborn nature of an individual or the environmental influences (to nurture the individual) that nurture the individual. So, while some psychologists investigate the relative influences of heredity versus environmental factors on behavior, today's researchers also focus on studying the dynamic interaction between environmental factors and genetic heritage. These philosophical discussions influenced the topics that would be considered in psychology. However, philosophers could only advance the understanding of human behavior to a point because of the limitation of their methods. Their methods were limited to intuition, observation, and logic. The emergence of psychology as a science hinged on advances in physiology. Physiology is a branch of biology that studies the functions and parts of living organisms, including humans. In the 1600s, interest was in the human brain and its relation to behavior. By the early 1700s, it was discovered that damage to one side of the brain produced a loss of function in the opposite side of the body. In the 1800s, scientists began to suggest that different brain areas were related to different behavioral functions. Taken together, the early work of physiologists established the foundation for the scientific methods that were subsequently applied to better understand behavior and mental processes.
2. The answer should include the following information: Wundt defined psychology as the study of consciousness and emphasized the use of experimental methods to study and measure consciousness. Edward Titchener was one of Wundt's most devoted students and he championed Wundt's ideas about the nature of psychology. He developed the concept of structuralism, which held that even our most complex conscious experiences can be broken down into elemental structures, or component parts, of sensations and feelings. William James, an American, had become intrigued by the emerging science of psychology after reading one of Wundt's articles. But there were other influences on the development of James's thinking. He took a more evolutionary approach to understanding physiology and behavior. James's ideas became the basis for a school of psychology, referred to as functionalism, which stressed studying the adaptive and practical functions of human behavior and mental experiences. Both structuralism and functionalism believed that psychology should focus on the study of conscious experiences. However, functionalists had very different ideas about the nature of consciousness and how it should be studied.
3. The answer should include the following information: In 1859, Charles Darwin's groundbreaking work, *On the Origin of Species,* was published. The book came to have a profound impact on William James's thinking about the developing field of psychology. James stressed the importance of adaptation to environmental challenges.

He wrote his own textbook on psychology that discussed brain function, habit, memory, sensation, perception, and emotion. James's ideas became the basis for a new school of psychology, called functionalism. Functionalism stressed the importance of how behavior functions to allow people and animals to adapt to their environments. Rather than trying to identify the essential structures of consciousness at a given moment, James saw consciousness as an ongoing stream of mental activity that shifts and changes. Functionalism's themes regarding the importance of the adaptive role of behavior and the application of psychology to enhance human behavior continue to be important in modern psychology.

4. The answer should include the following information: Mary Calkins studied with William James. She completed all the requirements for a Ph.D. in psychology. However, Harvard refused to grant her the Ph.D. degree because she was a woman, and at the time Harvard was not a coeducational institution. Nonetheless, Calkins made many contributions to psychology. She conducted research in dreams, memory, and personality. In 1891, she established a psychology laboratory at Wellesley College and wrote a well-regarded textbook titled *Introduction to Psychology*. In 1905, she was elected president of the American Psychological Association—the first woman, but not the last, to hold that position. Margaret Floy Washburn was the first American woman to earn an official Ph.D. in psychology. She was Edward Titchener's first doctoral student at Cornell University. She strongly advocated the scientific study of the mental processes of different animal species, and she published an influential textbook in 1908 titled *The Animal Mind*. She became the second woman elected president of the American Psychological Association.
5. The answer should include the following information: Francis C. Sumner was one of G. Stanley Hall's notable students as he was the first African American to receive a Ph.D. in psychology, from Clark University in 1920. He taught at several southern universities before moving to Howard University in Washington, D.C. At Howard, Sumner published many papers related to psychology, and he chaired a psychology department that produced more African American psychologists than all other American colleges and universities combined.
6. The answer should include the following information: Sigmund Freud, a physician from Vienna, Austria, developed a theory of personality based on uncovering causes of behavior that were unconscious, or hidden from the person's conscious awareness. Freud's school of thought, called psychoanalysis, emphasized the role of unconscious conflicts in determining behavior and personality. Freud was trained as a neurologist, but his thinking was strongly influenced by developments in psychology. Freud's psychoanalytic theory of personality and behavior was based largely on his work with his patients and on insights derived from self-analysis. Freud believed that human behavior was motivated by unconscious conflicts that were almost always sexual or aggressive in nature. Past experiences, especially those from childhood, were thought to be critical in the formation of adult personality and behavior. According to Freud, glimpses of these unconscious impulses are revealed in everyday life in dreams, memory blocks, slips of the tongue, and spontaneous humor. Freud believed that when unconscious conflicts became overwhelming, psychological disorders could result.
7. The answer should include the following information: Psychoanalysis emphasized the role of unconscious conflicts in determining behavior and personality. The

psychoanalytic theory of personality and behavior was based largely on Freud's work with patients and on insights derived from self-analysis. Freud believed that human behavior was motivated by unconscious conflicts that were almost always sexual or aggressive in nature. Past experiences, especially childhood experiences, were thought to be critical in the formation of adult personality and behavior. Freud believed that unconscious impulses were revealed in everyday life in dreams, memory blocks, slips of the tongue, and spontaneous humor. On the other hand, behaviorism rejected the emphasis on consciousness promoted by structuralism and functionalism as well as Freud's ideas about unconscious influences on behavior since they are difficult to test. For the behaviorist, consciousness and unconscious variables are not usable concepts. Instead, behaviorism believed that psychology should focus its scientific investigations strictly on overt, observable behaviors that could be objectively measured and verified.

8. The answer should include the following information: Behaviorism grew out of the pioneering work of Russian physiologist, Ivan Pavlov. Pavlov showed that dogs could learn to associate a neutral stimulus such as the sound of a bell with an automatic behavior, such as reflexively salivating to food. Once an association between the sound of the bell and the food was formed, the sound of the bell alone would trigger the salivation reflex in the dog. Pavlov believed he had discovered the mechanism by which all behaviors were learned. John B. Watson shared Pavlov's enthusiasm and championed behaviorism as a new school of thought for psychology. He believed that how behavior is acquired and modified in response to environmental influences is essential to the understanding of psychology. B. F. Skinner extended the ideas of Watson, believing that psychology should restrict itself to studying overt, observable behaviors that could be measured and verified. Skinner systematically used reinforcement or punishment to shape the behavior of rats and pigeons.
9. The answer should include the following information: Humanistic psychology was primarily advocated by the American psychologists Carl Rogers and Abraham Maslow. Rogers, like Freud, was influenced by his experiences with patients. Rogers emphasized the conscious experiences of his patients (rather than the unconscious) and focused on each person's unique potential for psychological growth and self-direction. Rogers believed that human behavior was shaped and maintained by external causes. The humanistic approach emphasized self-determination, free will, and choice in human behavior. Maslow developed a theory of motivation that emphasized psychological growth. Like psychoanalysis, humanistic psychology included not only influential theories of personality but also a form of psychotherapy.
10. The answer should include the following information: The biological perspective emphasizes the examination of the physical bases of human and animal behavior, including the nervous, endocrine, and immune systems, and genetics. Neuroscience involves the study of the nervous system, particularly the brain. Equally important for this perspective has been the advances in imaging technology (e.g., fMRI, PET) that have allowed the study of the activity of the intact, living brain. The psychodynamic perspective, Freud's landmark theory of psychoanalysis, continues to be relevant today. The emphasis in this perspective is on unconscious influences, early life experiences, and interpersonal relationships in explaining the underlying dynamics of behavior or in treating people with psychological problems. The behavioral perspective, championed by Watson and Skinner, involves a focus on observable behaviors and the fundamental

laws of learning. Psychologists interested in this perspective continue to study how behavior is acquired or modified by environmental causes. The humanistic perspective was influenced by the work of Carl Rogers and Abraham Maslow. This approach focuses on the motivation of people to grow psychologically, the influence of interpersonal relationships on a person's self-concept, and the importance of choice and self-direction in striving to reach one's potential. Positive psychology perspective focuses on the study of positive emotions and psychological states, positive individual traits, and the social institutions that foster those qualities in individuals and communities. The cognitive perspective involves examining the role of mental processes in how people process and remember information, develop language, solve problems, and think. The cross-cultural perspective involves studying how cultural factors influence behavior. Today, psychologists are keenly attuned to the influence of cultural factors on behavior. Although many psychological processes are shared by all humans, it's important to keep in mind that there are cultural variations in behavior. The evolutionary perspective involves the application of the principles of evolution to explain psychological processes and phenomena. Psychologists who take the evolutionary perspective assume that psychological processes are also subject to the principle of natural selection.

11. The answer should include the following information: The behavioral perspective focuses on observable behaviors and the fundamental laws of learning. The primary interest is in how behavior is acquired or modified by environmental causes. On the other hand, the cognitive perspective is interested in how mental processes influence behavior. These mental processes include memory, perception, intelligence, language, judgment, and thinking.
12. The answer should include the following information: The humanistic perspective was influenced by Carl Rogers and Maslow's development of a theoretical framework for motivation. This approach focuses on the motivation of people to grow psychologically, the influence of interpersonal relationships on a person's self-concept, and the importance of choice and self-direction in striving to reach one's potential.
13. The answer should include the following information: Individualistic societies emphasize the needs and goals of an individual over the needs and goals of the group. In these cultures, the self is seen as independent, autonomous, and distinctive. Personal identity is defined by individual achievements, abilities, and accomplishments. However, collectivistic cultures emphasize the needs and goals of the group over those of the individual. Social behavior is more heavily influenced by cultural norms and social context than by individual preferences and attitudes. Further, the self is seen as being much more interdependent with the group. That said, the majority of cultures are neither completely individualistic nor completely collectivistic, falling somewhere between these two extremes.
14. The answer should include the following information: The evolutionary perspective within psychology refers to the application of the principles of evolution to explain psychological processes. The theory of evolution proposes that the individual members of a species compete for survival. Because of inherited differences, some members of a species are better adapted to their environment than are others. Organisms that inherit characteristics that increase their chances of survival in their particular habitat are more likely to survive, reproduce, and pass on their characteristics to their offspring. But

individuals that inherit less useful characteristics are less likely to survive, reproduce, and pass on their characteristics. This process reflects the principle of natural selection: The most adaptive characteristics are "selected" and perpetuated in the next generation. In the context of psychology, psychologists assume that psychological processes are similarly subject to the principle of natural selection. Those psychological processes that help individuals adapt to their environments also help them survive, reproduce, and pass those abilities on to their offspring.

15. The answer should include the following information: Many people think that psychologists and psychiatrists are the same profession and undergo the same training. However, this assumption is not correct. Psychologists who specialize in clinical psychology are trained in the diagnosis, treatment, causes, and prevention of psychological disorders, leading to a doctorate in clinical psychology—a Ph.D. On the other hand, psychiatry is a medical degree either an M.D. or D.O., followed by several years of specialized training in the treatment of mental disorders. Psychiatrists can hospitalize people, order biomedical therapies, and prescribe medications for individuals. Generally speaking, clinical psychologists cannot order medical treatments or prescribe medications. However, in a few states, laws have been passed that allow clinical psychologists to prescribe medications following specialized training.
16. The answer should include the following information: Regardless of their approach or specialty, psychologists who do research are scientists. And like scientists, they rely on the scientific method to guide their research. Psychologists are guided by the basic scientific assumption that events are lawful and explainable. Psychologists are also open-minded and willing to consider new or alternative explanations of behavior and mental processes. However, their open-minded attitude is tempered by a healthy sense of scientific skepticism, using which they critically evaluate the evidence for new findings, especially when they seem contrary to established knowledge.
17. The answer should include the following information: Psychologists follow four basic steps as part of the scientific method. These steps are as follows:
    - Formulate a specific research question that can be tested.
    - Design a study to collect relevant data
    - Analyze the data and arrive at conclusions.
    - Report the results.
18. The answer should include the following information: Psychologists report and share their findings with others in the scientific discipline in order to advance the general body of knowledge within a particular area. They provide a detailed description of the study itself, who participated in it, how variables were operationally defined, how data were analyzed, and so forth. Describing the exact details of the study allows other investigators to repeat the study. This replication is an important step in the scientific process. If an experiment can be replicated and the same basic results are obtained again, it increases confidence in the results.
19. The answer should include the following information: As research findings accumulate from individual studies, theories will be developed. A theory, sometimes also called a model, is a tentative explanation that tries to account for diverse findings in a particular area. A theory attempts to integrate and summarize many research findings in a particular area. On the other hand, a hypothesis is a specific question that an experiment is designed to test. A good theory will generate new predictions and hypotheses that can

be tested by further research.

20. The answer should include the following information: First, they will use testimonials rather than scientific evidence. Second, they will use scientific jargon that lacks any real substance. Third, pseudoscientists will combine established scientific knowledge with unfounded claims to promote their agenda. Fourth, they will make irrefutable or nonfalsifiable claims. Fifth, scientific conclusions are based on converging evidence from multiple studies, not a single study. Pseudoscientists ignore this process and will instead focus on the findings of a single study that supports their claims. They will exclude other studies that contradict, or that are not consistent with, their agenda. Sixth, when challenged, pseudoscientists will shift the burden of proof to the skeptic, challenging the skeptic to disprove their claim. Finally, when pseudoscience fails to deliver, these individuals offer multiple excuses to explain why their approach or product did not work.
21. The answer should include the following information: Naturalistic observation involves the systematic observation and recording of behaviors as they occur in natural settings. The basic goal of naturalistic observation is to detect the behavior patterns that exist naturally—patterns that might not be apparent in a laboratory or if the subjects knew they were being watched. An advantage to this approach is that researchers can study human behaviors that cannot ethically be manipulated in an experiment, such as bullying behavior in children. As a research tool, naturalistic observation can be used wherever patterns of behavior can be openly observed—from the rain forests of the Amazon to restaurants, city streets, and classrooms. Because the observations occur in the natural setting, the results of naturalistic observation studies can be generalized to real-life situations with more confidence than can the results of studies using artificially manipulated or staged situations.
22. The answer should include the following information: Naturalistic observation involves the systematic observation and recording of behaviors as they occur in natural settings. The basic goal of naturalistic observation is to detect the behavior patterns that exist naturally—patterns that might not be apparent in a laboratory or if the subjects knew they were being watched. On the other hand, a case study is an intensive, in-depth investigation of an individual, a family, or some other social unit. Case studies involve compiling detailed information from numerous sources to construct a complete picture of an individual. This approach may involve interviews with friends and family as well as co-workers. Psychological and biographical records neurological and medical records, and even school or work records may be examined. Case studies are often used by clinical psychologists to develop a complete profile of a psychotherapy client.
23. The answer should include the following information: Scientists randomly select a sample of participants to be included in a study. Random selection means that every member of the larger group or population may have an equal opportunity to be included in the sample.
24. The answer should include the following information: A correlational study examines how strongly two variables are related to, or associated with, one another. Correlations can be used to analyze the data gathered by any type of descriptive method, and they are also used to analyze the results of experiments. However, even if two factors are very strongly correlated, a correlation does not indicate a causal relationship between variables. It only tells you that two variables seem to be related or co-vary in some

systematic way. This approach cannot be used to demonstrate a true cause-and-effect relationship—an experiment would be required to achieve that goal.

25. The answer should include the following information (Answers will vary.): A positive correlation is one in which two factors vary in the same direction so that two variables increase or decrease together. For example, the text cites a strong positive correlation between GPA and the use of self-testing as a study strategy. The more students engage in self-testing, the better their GPA. The text gives several additional examples at the end of the chapter related to studying. These techniques may be used to improve GPA.
26. The answer should include the following information (Examples will vary.): A positive correlation is one in which the two factors vary in the same direction such that they increase or decrease together. For example, the text cites a strong positive correlation between GPA and the use of self-testing as a study strategy. The more students engage in self-testing, the better their GPA. In contrast, a negative correlation is one in which two variables move in opposite directions: As one factor decreases, the other increases. The text cites a study that investigated multitasking and GPA. A study found that there was a negative correlation between time spent sending text messages while studying and GPA: As time spent texting while studying increased, GPA decreased.
27. The answer should include the following information: In an experiment, the independent variable is deliberately manipulated by the researcher and the effects of this manipulation are observed on the dependent variable. Thus, changes in the dependent variable depend on variations in the independent variable; any changes that occur in the dependent variable can be attributed to the deliberate manipulation of the independent variable. In summary, the dependent variable is measured, and the independent variable is manipulated.
28. The answer should include the following information: The second group of participants is receiving a placebo, which is sometimes referred to as a sugar pill. In this example, the second group of participants believes they are consuming caffeine when in fact they are simply drinking decaffeinated beverages (the placebo).
29. The answer should include the following information: A natural experiment is not a true experiment. In this approach, researchers carefully observe and measure the impact of a naturally occurring event such as disasters, epidemics, or some other condition. One issue with typical laboratory experiments is that they are criticized for being too arbitrary and may not generalize to the real world. There may be experiments that cannot be conducted because of ethical issues. Researchers are sometimes able to take advantage of naturally occurring events or conditions. In natural experiments, researchers cannot randomly assign large numbers of participants to long-term living situations.
30. The answer should include the following information:
    1. Identify the claim.
    2. Evaluate the evidence.
    3. Consider alternative explanations.
    4. Consider the source of the research or claim.
31. The answer should include the following information: (1) Positron emission tomography (PET) is based on the fact that increased activity in a particular brain region is associated with increased blood flow and energy consumption. A small amount of radioactively tagged glucose, oxygen, or other substance is injected into the person's

blood stream. While performing a mental task, the PET scanner tracks the amounts of radioactive substances used in thousands of different brain regions. A computer analyzes the data, producing color-coded images of the brain's activity. (2) Magnetic resonance imaging (MRI) does not involve invasive procedures such as injections of radioactive substances. Instead, the individual lies inside a magnetic tube as powerful but harmless magnetic fields bombard the brain. A computer analyzes the signals generated by brain-tissue molecules in response to the magnetic fields. The result is a series of digital images, each a detailed "slice" of the brain's structures. (3) Functional MRI (fMRI) combines the ability to produce a detailed image of the brain's structures with the capacity to track the brain's activity or functioning. While the individual lies in the MRI scanner, a powerful computer tracks the electromagnetic signals that are generated by changes in the brain's metabolic activity, such as increased blood flow to a particular brain region. By measuring the ebb and flow of oxygenated blood in the brain, an fMRI produces a series of scans that show detailed moment-by-moment "movies" of the brain's changing activity in specific structures or regions.

32. The answer should include the following information: First, psychologists must inform participants of the purpose of the research as well as factors that might influence a person's willingness to participate in the study. These factors include potential risks, discomfort, or unpleasant emotional experiences. The psychologist must also inform the participants that they are free to decline to participate or to withdraw from the research at any time. This guideline is referred to as informed consent and voluntary participation. Second, deception may be used in experiments when it is not possible to use alternatives that do not involve deception. Alternatively, there may be situations in which deception is necessary for scientific, educational, or applied value. Third, information should remain confidential. Psychologists should not disclose the identity or identifying information about research subjects in their writing, lectures, or other public arenas.
33. The answer should include the following information: First, psychologists may be interested in the study of animal behavior for its own sake. Such research improves the quality of life of animals in zoos and may increase the likelihood of survival of endangered species in the wild. Second, animals may be used to address questions that cannot be done in human subjects. Finally, psychologists can exercise greater control over animals than they can over human subjects. Researchers can control the animals' environment as well as their genetic background.
34. The answer should include the following information: Six successful study tips include:
    1. Focus your attention.
    2. Engage your mind: Be an active reader.
    3. In the classroom, take notes by hand, not on your laptop.
    4. Practice retrieval: The testing effect.
    5. Use flashcards and practice tests correctly.
    6. Space out your study time.