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Practice Questions

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**1. Sam sits at a computer terminal and watches some flashes on the screen. After watching the flashes, Sam becomes happier. Unknown to Sam the flashes are actually the words kittens and smile.

What psychological phenomenon is Sam experiencing?**

A. General well-being
B. Emotional contagion
C. Accommodation
D. Priming

2. Early personality theories in psychology assumed that personality was expressed in people's physical appearance. Which alternative correctly matches an early approach with a definition?

A. Physiognomy—personality is expressed in the shape of the skull
B. Phrenology—personality is expressed in body type
C. Somatology—personality is expressed in the shape of the skull
D. Physiognomy—personality is expressed in facial characteristics

3. The son of a bricklayer goes to college and i) becomes a teacher at a medical school, ii) gets promoted to tenured professor, and iii) moves across the country for a new tenured professor position at a different school. Sequentially, this man has experienced:

A. intergenerational mobility with respect to the father, horizontal mobility, horizontal mobility
B. intragenerational mobility with respect to the son, horizontal mobility, upward mobility
C. intergenerational mobility with respect to the father, upward mobility, horizontal mobility
D. intragenerational mobility with respect to the son, upward mobility, upward mobility

4. Which of the following is characteristic of stage 1 of non-rapid eye movement sleep (NREM sleep)?

A. Electroencephalogram (EEG) activity is increased, with the appearance of spikes called K complexes.
B. Electroencephalogram records delta activity.
C. Eye movement ceases, wave frequency is reduced, and wave amplitude is increased.
D. Eye movements are slow and electroencephalogram (EEG) shows low brain wave activity.

5. According to attachment theory, which of the following children is most likely to attach to a male psychologist, previously unknown to the child, in the course of a psychological study?

A. A five month old male infant raised in a safe, stable environment
B. A thirteen month old female infant raised by two caregivers who occasionally neglect the child
C. A two month old female infant raised in a safe, stable environment
D. An eight month old male infant raised by a single caregiver who frequently neglect the child

6. Why might implicit measures such as the IAT be used to assess racial stereotypes?

A. To assess them on computers
B. To assess them in people who cannot answer self-report measures
C. To assess them more quickly
D. To assess them more accurately

**7. One outcome of stereotypes is that they may end up guiding our behaviors. For instance, a woman who attends a high school in which girls are not expected to enjoy or excel at mathematics may end up taking only a minimal number of mathematics courses and having little interest in math.

Which of the following psychological concepts best describes this?**

A. Behavioral confirmation
B. Fundamental attribution error
C. Social enhancement
D. Cognitive dissonance

8. What conclusions can you draw from the attached graph?

A. The wild type of the virus is unable to cause infection.
B. The mutation increased the infection rate.
C. The mutation slowed the infection rate.
D. The mutation had no impact on infection rate.

9. Mutations to p53 that interfere with DNA binding are most likely to result in

A. Upregulation of p21 expression and an increase in CDK-dependent phosphorylation.
B. Downregulation of p21 expression and a decrease in CDK-dependent phosphorylation.
C. Upregulation of p21 expression and a decrease in CDK-dependent phosphorylation.
D. Downregulation of p21 expression and an increase in CDK-dependent phosphorylation.

10. According to the attached table, what effect does the addition of cholesterol have on the palmitic acid synthetic membranes?

A. The cholesterol increased fluidity at temperatures above 35 degrees C.
B. The cholesterol reduced the fluidity at temperatures below 0 degrees C.
C. The cholesterol reduced the fluidity at all temperatures.
D. The cholesterol increased the fluidity at all temperatures.

11. Which characteristic is shared by the human pancreas and gastric glands?

A. They produce insulin.
B. Their secretions contain zymogens.
C. Their secretions are acidic.
D. They are simple tubes that open into a single duct.

12. Based on the results of these experiments, what kind of evolutionary selection in M. guttatus might result from variations in bee visitation and probes for inbred and outbred plants?

A. Both inbred and outbred plants should thrive equally, since the plants were, on average, equally attractive to pollinators.
B. E outbred plants were found, on average, to be less attractive to pollinators than inbred plants, which could reduce their fitness.
C. Ither inbred nor outbred plants attracted pollinators, which could lead to dramatic population declines for plants of both varieties.
D. E inbred plants were found, on average, to be less attractive to pollinators than outbred plants, which could reduce their fitness.

13. How many pi bonds are present in benzylamine?

A. Three
B. Seventeen
C. Eight
D. Four

**14. A patient is admitted to the hospital after a traumatic injury to her adrenal cortex.

Which of the following hormones is most likely to be present at normal levels?**

A. Corticotropin-releasing hormone (CRH)
B. Aldosterone
C. Adrenocorticotropic hormone (ACTH)
D. Antidiuretic hormone (ADH)

**15. Besides the enantiomer shown below, how many other possible stereoisomers of ephedrine are possible?

<img src="asset:assets/questions/cd8b65e6d851295f.jpg">**

A. 5
B. 3
C. 2
D. 4

16. Which of the following is not a function of microtubules?

A. Component of sarcomere scaffold structure
B. Produce mitotic spindle
C. Component of flagella structure
D. Component of the cytoskeleton

**17. A<tex>\displaystyle 1.0kg</tex> block slides along a smooth surface at a velocity of<tex>\displaystyle 2\frac{m}{s}</tex>. The block then encounters a rough surface and continues for six meters before coming to a complete stop.

What is the force of friction on the block?**

A. <tex>\frac{1}6\text{N}{}</tex>
B. <tex>6\text{N}</tex>
C. <tex>3\text{N}</tex>
D. <tex>\frac{1}{3}\text{N}</tex>

18. How will the gravitational force between two objects change if the distance between them is doubled?

A. It will be cut in half.
B. It will increase by a factor of 4.
C. It will decrease by a factor of 4.
D. It will remain constant.

19. The difference in refractive indices for chitin with light at 350 and 800 nm can be attributed to

A. Constructive optical interference, such that the light waves superpose to generate a resultant wave of a higher amplitude.
B. Destructive optical interference, such that the light waves superpose to generate a resultant wave of a smaller amplitude.
C. The photoelectric effect, such that electrons are ejected when light hits a given medium.
D. The principle of optical dispersion, such that the velocity of a wave in a given medium depends on its frequency.

20. How does the formal charge of nitrogen change over the course of this reaction?

A. The formal charge does not change.
B. The formal charge decreases by 1.
C. The formal charge decreases by 2.
D. The formal charge increases by 1.

**21. The student in the passage wants to replace the water, represented by the blue in the diagram, with an alternative solvent.

Which solvent would be most likely to produce a functioning cell?**

A. Acetic acid
B. Carbon tetrachloride
C. Benzene
D. Ethane

**22. Two campers are preparing food at an altitude of 13,000 feet on a mountain in Colorado.

Which of the following is true as they boil a pot of water?**

A. They will likely have to cook their food a shorter time than at sea level, since it takes less heat to make vapor pressure match atmospheric pressure
B. If they add salt to the water, it will help speed the rate at which the water boils
C. They will likely have to cook their food longer than at sea level, since it takes more heat to make vapor pressure match atmospheric pressure
D. They will likely have to cook their food a shorter time than at sea level, since it takes more heat to make vapor pressure match atmospheric pressure

23. What is the kinetic energy at the spring's equilibrium position?

A. 36 J
B. 72 J
C. 16 J
D. 12 J

**24. Nuclear reactions, such as the one described above with uranium, emit energy in the form of radiation. A scientist is considering three different forms of radiation to generate power.

Which of the following types of radiation is highest in energy?**

A. Positron emission
B. Alpha radiation
C. Gamma radiation
D. Electron capture

**25. A follow-up article is published by the same author.

Which of these do you think is most likely to be the focus of the follow-up article?**

A. An account of Churchill’s experiences in the army
B. A consideration of Churchill’s future in politics
C. Anecdotal evidence about Churchill’s political talents
D. A description of Churchill’s childhood

26. Which of these claims could be criticized for being unsupported?

A. The Pope would decry the French Revolution.
B. Wise men avoid summations and generalizations.
C. Robespierre is beloved by some historians and deplored by others.
D. All of these claims could be criticized for being unsupported.

27. What relevance does the underlined piece of information have to the author’s overall tone and argument?

A. Demonstrates how obvious the author thinks his argument is and the ease with which he feels the opposition could be refuted
B. Shows why the author is disinclined towards trusting the government and why he feels that changes need to be made
C. Provides evidence to support the author’s thesis that is frequently linked back to throughout the rest of the essay
D. Highlights the extent of bloodshed that has consistently gripped civilization

28. Which of the following would have most strengthened the author's argument?

A. Illustrations of the Beatles' clothing and album covers
B. Additional quotations from primary or secondary sources
C. Some background information on the individual Beatles
D. Examples supporting the second paragraph's conclusions

29. The Committee of Ten publishes another report five years after this one, stating that American children are more easily inspired by American historical figures than by foreign figures; how would this affect a revised edition released by the authors?

A. It would have no effect; the authors do not agree with the Committee of Ten.

B. The authors would adjust their focus to include the biographies of more common and relatable Americans.

C. The authors would continue to focus on great men, but adjust their it to include more famous Americans.

D. It would have no effect; the authors are assured of their methodology.

30. Which of the following sentences from the passage implies a source may have been biased?

A. Statistics on home-school.com present a remarkable disparity between homeschooled and public-schooled students.

B. The site also claims that homeschooled students are 9.2% more likely to graduate from college than ones who'd been publicly educated.

C. For example, a homeschooled student having trouble with math is more likely to receive special attention in that area from a teacher undistracted by an excess of other students.

D. While those educated in public schools consistently perform in the 50th percentile (meaning 50 percent of the total test takers scored lower than them) across all major subjects (reading, language, math, science, and social studies), homeschooled students tend to place somewhere in the mid- to upper-eighties range, a strong indication that homeschooling leads to far superior test scores.

Answer Key & Explanations

1. D — Priming
Priming occurs when, generally without awareness, exposure to a stimulus changes thoughts, feelings, or behaviors.

2. D — Physiognomy—personality is expressed in facial characteristics
Physiognomy refers to the study of a person's facial features or expression.

3. C — intergenerational mobility with respect to the father, upward mobility, horizontal mobility
Intragenerational mobility, also called career mobility, describes a change in an individual's social standing during the course of an individual's lifetime. Intragenerational mobility most often occurs through promotions and demotions at work. Intergenerational mobility involves a change in social standing across generations, such as when an upper class family loses their fortune and the next generation all become tradesmen. Alternatively, children of a working class family might work very hard to increase their social standing through education and career advancement. a) intergenerational mobility with respect to the father, horizontal mobility, horizontal mobility, incorrect, The promotion is an example of upward rather than horizontal mobility. Horizontal mobility refers to a move within the same category of status, e.g. taking a job in a new location with equivalent title to a former job. Vertical mobility, which may be upward or downward, refers to moving from one social level to another. b) intragenerational mobility with respect to the son, upward mobility, upward mobility, incorrect, The transfer is an example of horizontal rather than vertical mobility. c) intergenerational mobility with respect to the father, upward mobility, horizontal mobility, correct. d) intragenerational mobility with respect to the son, horizontal mobility, upward mobility, incorrect, The promotion is upward mobility and the transfer is horizontal mobility.

4. D — Eye movements are slow and electroencephalogram (EEG) shows low brain wave activity.
The non-rapid eye movement stage of sleep, NREM or synchronized sleep, involves four stages. The transition from wakefulness to sleep occurs during stage 1. Eye movements are slow and the electroencepalogram (EEG) shows low brain wave activity. In stage 2, EEG activity is increased. Spikes called K complexes are recorded. In stage 3, eye movement ceases. Wave frequency is reduced and amplitude is increased. Delta activity is recorded on the EEG in stage 4. Stages 3 and 4 are considered deep sleep.

5. C — A two month old female infant raised in a safe, stable environment
Attachment theory describes a series of steps that infants will progress through as they grow. During the first three months of life, an infant will indiscriminately attach to any person and will respond equally to any caregiver. Thus (A) is an apt description of attaching to a previously unknown adult. Around 4 to 6 months babies will begin to recognize certain caregivers but will still accept care from anyone. Thus in (B) the baby will probably accept care from the psychologist, but the infant in (A) is much more likely to attach to the psychologist. From 6 to 9 months a baby will exhibit a strong attachment preference for a single caregiver, although the pattern of that attachment will vary based on the relationship that has developed between the caregiver and the child. Despite the neglect, the child in (C) will still have a preference for a single caregiver.

After 9 months, children slowly develop increasing independence and will slowly form multiple attachments. The child in (D) will thus begin to develop attachments to both caregivers, but not to the psychologist, who is a stranger.

6. D — To assess them more accurately
The IAT is used to assess stereotypes without people being able to hide them from the experimenter.

7. A — Behavioral confirmation
Behavioral confirmation is a concept type self-fulfilling prophecy that occurs when one's expectations about appropriate behavior ends up creating that behavior.

8. C — The mutation slowed the infection rate.
The infection radius is larger in the wild type of the pox virus, which indicates the extent of infection.

9. D — Downregulation of p21 expression and an increase in CDK-dependent phosphorylation.
p53 regulates p21 expression, increasing p21 expression when it detects damaged DNA. An inability of p53 to bind to DNA would downregulate p21 expression levels. p21, in turn, binds to cyclins, preventing activation of CDK-dependent phosphorylation.

10. C — The cholesterol reduced the fluidity at all temperatures.
Comparing the POPC/CHOL and POPC results, the fluidity was reduced because the speeds in the POPC/CHOL results are lower than the POPC results.

11. B — Their secretions contain zymogens.
The pancreas produces multiple zymogens that are activated within the small intestine; the gastric glands produce pepsinogen, which is converted to pepsin under acidic conditions.

12. D — E inbred plants were found, on average, to be less attractive to pollinators than outbred plants, which could reduce their fitness.
The inbred plants attracted fewer pollinators and experienced fewer probes per visit than outbred plants. This could result in further reduced fitness of inbred plants and effectively select for future out-crossing. On average, the outbred plants were more attractive to pollinators than inbred plants—but both inbred and outbred plants were capable of attracting pollinators.

13. A — Three
Benzylamine consists of a benzene ring with a -CH₂NH₂ substituent. The benzene ring contains three double bonds, and the substituent has none.

Each bond in a compound represents a sigma bond. Each additional bond represents a pi bond; thus, double binds result from one sigma and one pi bond, and triple bonds from one sigma and two pi bonds. In benzylamine, there are three double bonds and seventeen total bonds, three of which are double bonds. The compound will have a total of seventeen sigma bonds and three pi bonds.

14. D — Antidiuretic hormone (ADH)
Of all the hormones listed, antidiuretic hormone (ADH) is the only one that neither acts on, nor is released by, the adrenal cortex. ADH is released from the posterior pituitary and causes the kidneys to retain more water.

Aldosterone (a mineralcorticoid) and cortisol (a glucocorticoid) are both incorrect choices because they are released by the adrenal cortex and would be greatly affected by trauma to that area. ACTH is released by the anterior pituitary and acts to stimulate the adrenal cortex; these hormones act as part of a negative feedback chain, so damage to the target area would temporarily cause more ACTH to be produced.

The same goes for CRH, which is released by the hypothalamus and stimulates secretion of ACTH.

15. B — 3
Ephedrine has two stereocenters (carbons 1 and 2), meaning there would be <tex>\displaystyle 2^2</tex>, or <tex>\displaystyle 4</tex>, total possible stereoisomers. One is already shown, so there would be three others.

16. A — Component of sarcomere scaffold structure
Microtubules are made of the tubulin protein and play integral roles in cell structure. They are prominent in the cytoskeleton and form the fundamental structures for cilia and flagella. The mitotic spindles are also comprised of microtubules, and are used to draw apart the sister chromatids of each chromosome during cell division.

Microtubules do not play a significant role in the structure or function of sarcomeres. Actin and myosin compose the main functional basis of the sarcomere, while titin and the Z disc proteins provide the sarcomere structure.

17. D — <tex>\frac{1}{3}\text{N}</tex>
This question can be answered using conservation of energy. Having an understanding of the work-energy theorem allows us the knowledge that changing kinetic energy is a form of work, and that work can be a form of energy. In this particular question, the only force acting on the block to slow it down is the force of friction from the rough surface. As we know, work is equal to force times distance.

<tex>\displaystyle W=Fd</tex>

Because the block started with a certain amount of kinetic energy, and then is brought to a complete stop, all of that kinetic energy is transferred to work done by the force of friction over a distance of six meters.

<tex>\displaystyle W=\Delta KE=\frac{1}{2}m(\Delta v)^2</tex>

Because the <tex>\displaystyle 1.0kg</tex> block had a velocity of <tex>\displaystyle 2\frac{m}{s}</tex> on a smooth surface and ends with a velocity of <tex>\displaystyle 0\frac{m}{s}</tex> at rest, we can calculate the change in kinetic energy.

<tex>\displaystyle \Delta KE=\frac{1}{2}(1.0kg)(0\frac{m}{s}-2\frac{m}{s})^2=\frac{1}{2}(1.0kg)(4\frac{m^2}{s^2})</tex>

<tex>\displaystyle \Delta KE=2J</tex>

The kinetic energy is completely converted to the work done by friction.

<tex>\displaystyle W=\Delta KE=2J</tex>

We can then use the first equation for work to determine the force of friction.

<tex>\displaystyle W=Fd=F_f(6m)=2J</tex>

<tex>\displaystyle F_f=\frac{2J}{6m}=\frac{1}{3}N</tex>

18. C — It will decrease by a factor of 4.
The gravitational force between two objects is inversely proportional to the distance between them squared.

19. D — The principle of optical dispersion, such that the velocity of a wave in a given medium depends on its frequency.
The interaction of the light and the electrons in the medium varies with frequency.

Choice B is incorrect because while the description of the photoelectric effect in this answer is accurate, it is not relevant to the noted difference in refractive indices. The two refractive indices were measured separately for light at 350 and 800 nm, so there is no interference between waves playing a role here.

20. D — The formal charge increases by 1.
In NH₃, nitrogen has a formal charge of 0 because the nitrogen is surrounded by three bonded hydrogens and one lone electron pair. In the Lewis adduct, nitrogen is surrounded by four bonds, so its new formal charge is +1. The nitrogen gives up two electrons to form the coordinate bond with boron, but its formal charge increases in the process. Converting a lone electron pair on an atom to a bonding electron pair will

inevitably change the formal charge of that atom.

21. A — Acetic acid
The function of a voltaic cell requires the generation and dissolution of ions. Acetic acid is the only answer choice with a net dipole moment, and would therefore be the only one to dissolve the ions produced. The other choices would be unable to dissolve the ions, and the cell would not function.

22. A — They will likely have to cook their food a shorter time than at sea level, since it takes less heat to make vapor pressure match atmospheric pressure
The local atmospheric pressure at 13,000 feet is less than the pressure at sea level; therefore, it takes less heat to make the vapor pressure meet the local atmospheric pressure. Heat added to the system easily exits again as the water is converted to steam, leaving less heat in the water to cook the food. Food cooks more slowly as a result.

23. A — 36 J
At the equilibrium position, the kinetic energy is at its highest and is equivalent to the total mechanical energy. It can be calculated using the equation <img src="asset:assets/questions/111eeac5e545f55b.gif"> which is the same as the potential energy equation when the spring is fully extended, since at the equilibrium position, all potential energy has been converted to kinetic energy. As such, <img src="asset:assets/questions/9968f6858fa4383a.gif"><img src="asset:assets/questions/793381ee670fe5e4.gif"><img src="asset:assets/questions/042764f9d7c47778.gif"> Choice A would be obtained if the distance was not squared in the kinetic energy equation.

Choice B would be obtained if the mass of the box was entered in place of the distance in the kinetic energy equation.

Choice D would be obtained if the <img src="asset:assets/questions/a5f5a84b0f2fd975.gif"> were excluded from the kinetic energy equation.

24. C — Gamma radiation
Gamma radiation is a highly energetic form of radiation, and is the type of radiation emitted when antimatter and matter annhilate each other upon contact.

25. B — A consideration of Churchill’s future in politics
In this article, the author focuses on Churchill’s young life. He considers the personality traits and experiences that made Churchill who he was and that precipitated his rise to prominence in British society. The passage, although primarily focused on Churchill’s experiences as a young man, turns at the end to a commentary on Churchill as an older man. The author includes the following quotation from one of Churchill’s contemporaries: “‘I have understated it even now, for he has achieved two careers as a politician—one on each side of the House. His first career on the Government side was a really distinguished career. I trust the second will be even more distinguished—and more prolonged.’” This suggests that if the author were to write a follow-up article, it would be more focused on Churchill’s later life and future in politics.

26. A — The Pope would decry the French Revolution.
All of these claims are either directly supported by further explanation and analysis or else indirectly supported by the overall argument of the essay except for the author’s claim “That the French Revolution led to an immense augmentation of happiness, both for the French and for mankind, can only be denied by the Pope.” Here, the author makes the assumption that the reader already knows that the Pope would deny that the French Revolution led to a great enhancement to human happiness and makes no effort to support his claim.

27. A — Demonstrates how obvious the author thinks his argument is and the ease with which he feels the opposition could be refuted
In the underlined portion of the passage, the author is effectively saying, “It would be a good enough response for me to say that the states would make war with one another because neighboring states have always made war with one another.” The author is essentially opening his argument by saying “Look, my argument is so obvious, I should not even need to make it.”.

28. B — Additional quotations from primary or secondary sources
The author quotes from only one source, RollingStone.com, in this passage, and it is a very general quote. The argument would have been stronger if the author had supported the passage's various conclusions with a few quotations from other sources so the reader could be sure the author was not merely making up these conclusions.

29. C — The authors would continue to focus on great men, but adjust their it to include more famous Americans.
The authors are clearly great admirers of the work of the Committee of Ten and reference it as the guiding force behind their methodology, so one can therefore assume that if the Committee revised its findings then the authors would be inclined to revise their focus as well. The authors would continue their focus on great men, because this aspect has not been disproved by the introduction of new information, but they would adjust their focus to include more famous Americans.

30. B — The site also claims that homeschooled students are 9.2% more likely to graduate from college than ones who'd been publicly educated.
The author's use of the word claims implies a certain amount of skepticism, perhaps because these statistics supporting the effectiveness of homeschooling come from a website focused on homeschooling.

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