

MCAT Full-Length Practice Test

Form 2

Directions. This is an original independent full-length practice form designed to mirror the current four-section MCAT structure. Select the best answer for each question and observe the section timing. Do not use the answer appendix until the full form is complete. **Timing.** The four content sections total 6 hours 15 minutes: Chemical and Physical Foundations 95 minutes, CARS 90 minutes, Biological and Biochemical Foundations 95 minutes, and Psychological, Social, and Biological Foundations 95 minutes. Breaks and optional tutorial time are separate. This is not an official AAMC form.

MCAT Chemical and Physical Foundations of Biological Systems

Section timing: 95 minutes

Passage 1: Nuclear chemistry

In a follow-up study of radioactive decay, investigators compared two conditions that differed in the elapsed time after a sample is prepared. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Samples of different starting activity lost the same fraction, rather than the same number of nuclei, during one half-life. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that each half-life removes half of the nuclei present at its beginning. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

1. Which new result would most clearly distinguish the proposed explanation of radioactive decay from a competing mechanism?
 - A. Half-life changes when the amount of sample changes.
 - B. Radioactive decay requires a catalyst to proceed.
 - C. Samples with different initial activities show the same fractional decrease.
 - D. The same absolute number of nuclei disappears during every equal time interval.
2. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
 - A. The same absolute number of nuclei disappears during every equal time interval.
 - B. Half-life changes when the amount of sample changes.
 - C. Radioactive decay requires a catalyst to proceed.
 - D. After one half-life, approximately half of the original radioactive nuclei remain.
3. Which protocol would best isolate the effect of the elapsed time after a sample is prepared on radioactive decay?
 - A. Samples with different initial activities show the same fractional decrease.
 - B. Measure matched samples of the same isotope at several elapsed times while recording starting activity and keeping temperature constant.
 - C. The same absolute number of nuclei disappears during every equal time interval.
 - D. Half-life changes when the amount of sample changes.

4. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. The same absolute number of nuclei disappears during every equal time interval.
 - B. Half-life changes when the amount of sample changes.
 - C. After one half-life, approximately half of the original radioactive nuclei remain.
 - D. Measure matched samples of the same isotope at several elapsed times while recording starting activity and keeping temperature constant.
5. Which observation would be most inconsistent with the proposed explanation of radioactive decay?
- A. Samples with different initial activities show the same fractional decrease.
 - B. After one half-life, approximately half of the original radioactive nuclei remain.
 - C. Half-life provides an isotope-specific time scale for comparing fractional activity across matched samples.
 - D. The same absolute number of nuclei disappears during every equal time interval.

Passage 2: Membrane transport

In a follow-up study of electrochemical gradients, investigators compared two conditions that differed in the concentration gradient of an ion. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: With voltage fixed, increasing the ion concentration ratio increased the initial current through the open channels. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that an ion responds to the combined electrochemical gradient. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

6. Which new result would most clearly distinguish the proposed explanation of electrochemical gradients from a competing mechanism?
- A. The reversal potential shifts when the concentration ratio changes.
 - B. Passive transport moves solute against its electrochemical gradient without energy input.
 - C. ATP is required for every form of membrane movement.
 - D. Membrane composition cannot affect solute flux.
7. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Net ion movement initially increases in the direction favored by the larger concentration gradient.
 - B. Passive transport moves solute against its electrochemical gradient without energy input.
 - C. ATP is required for every form of membrane movement.
 - D. Membrane composition cannot affect solute flux.
8. Which protocol would best isolate the effect of the concentration gradient of an ion on electrochemical gradients?
- A. Keep membrane voltage and channel number fixed while varying the ion concentration ratio.

- B. Passive transport moves solute against its electrochemical gradient without energy input.
 - C. ATP is required for every form of membrane movement.
 - D. The reversal potential shifts when the concentration ratio changes.
9. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Passive transport moves solute against its electrochemical gradient without energy input.
 - B. Keep membrane voltage and channel number fixed while varying the ion concentration ratio.
 - C. ATP is required for every form of membrane movement.
 - D. Net ion movement initially increases in the direction favored by the larger concentration gradient.
10. Which observation would be most inconsistent with the proposed explanation of electrochemical gradients?
- A. Net ion movement initially increases in the direction favored by the larger concentration gradient.
 - B. A concentration gradient alone does not fully determine charged-particle movement because membrane voltage also contributes.
 - C. Passive transport moves solute against its electrochemical gradient without energy input.
 - D. The reversal potential shifts when the concentration ratio changes.

Passage 3: Thermodynamics

In a follow-up study of free-energy change, investigators compared two conditions that differed in the temperature of a reaction with a favorable entropy change. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The process became favorable only above the temperature at which the entropy term outweighed the unfavorable enthalpy term. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that Gibbs free energy combines enthalpy with the temperature-weighted entropy change. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

11. Which new result would most clearly distinguish the proposed explanation of free-energy change from a competing mechanism?
- A. Temperature cannot affect the Gibbs free-energy change.
 - B. Enthalpy and entropy are interchangeable measures of energy.
 - C. The reaction becomes favorable only above a temperature threshold.
 - D. A positive entropy change guarantees spontaneity at every temperature.
12. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. The process becomes more favorable as temperature rises when the entropy change is positive.
 - B. A positive entropy change guarantees spontaneity at every temperature.
 - C. Temperature cannot affect the Gibbs free-energy change.
 - D. Enthalpy and entropy are interchangeable measures of energy.

13. Which protocol would best isolate the effect of the temperature of a reaction with a favorable entropy change on free-energy change?
- A. A positive entropy change guarantees spontaneity at every temperature.
 - B. Temperature cannot affect the Gibbs free-energy change.
 - C. The reaction becomes favorable only above a temperature threshold.
 - D. Compare the same reaction at several temperatures while holding pressure and reactant amounts constant and estimating enthalpy and entropy under each condition.
14. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. A positive entropy change guarantees spontaneity at every temperature.
 - B. Compare the same reaction at several temperatures while holding pressure and reactant amounts constant and estimating enthalpy and entropy under each condition.
 - C. The process becomes more favorable as temperature rises when the entropy change is positive.
 - D. Temperature cannot affect the Gibbs free-energy change.
15. Which observation would be most inconsistent with the proposed explanation of free-energy change?
- A. The reaction becomes favorable only above a temperature threshold.
 - B. The process becomes more favorable as temperature rises when the entropy change is positive.
 - C. A temperature change can alter spontaneity when enthalpy and entropy make competing contributions.
 - D. A positive entropy change guarantees spontaneity at every temperature.

Passage 4: Organic functional groups

In a follow-up study of carbonyl reactivity, investigators compared two conditions that differed in the electron-withdrawing strength near a carbonyl. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The substrate with the stronger electron-withdrawing group reacted faster with the same nucleophile under matched conditions. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that electron withdrawal leaves the carbonyl carbon more electron-poor. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

16. Which new result would most clearly distinguish the proposed explanation of carbonyl reactivity from a competing mechanism?
- A. The carbonyl carbon acts as a nucleophile in every reaction.
 - B. Related carbonyl compounds must have identical reaction rates.
 - C. Substituents cannot alter electron density near a carbonyl.
 - D. The more electron-poor substrate reacts faster under matched conditions.
17. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?

- A. A nucleophile attacks the carbonyl carbon more readily.
 - B. The carbonyl carbon acts as a nucleophile in every reaction.
 - C. Related carbonyl compounds must have identical reaction rates.
 - D. Substituents cannot alter electron density near a carbonyl.
18. Which protocol would best isolate the effect of the electron-withdrawing strength near a carbonyl on carbonyl reactivity?
- A. The more electron-poor substrate reacts faster under matched conditions.
 - B. Compare substrates with the same carbon skeleton and different substituents.
 - C. The carbonyl carbon acts as a nucleophile in every reaction.
 - D. Related carbonyl compounds must have identical reaction rates.
19. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. A nucleophile attacks the carbonyl carbon more readily.
 - B. The carbonyl carbon acts as a nucleophile in every reaction.
 - C. Compare substrates with the same carbon skeleton and different substituents.
 - D. Related carbonyl compounds must have identical reaction rates.
20. Which observation would be most inconsistent with the proposed explanation of carbonyl reactivity?
- A. The more electron-poor substrate reacts faster under matched conditions.
 - B. A nucleophile attacks the carbonyl carbon more readily.
 - C. Electronic effects help explain why related carbonyl compounds have different reactivities.
 - D. The carbonyl carbon acts as a nucleophile in every reaction.

Passage 5: Optics and imaging

In a follow-up study of lens formation, investigators compared two conditions that differed in the curvature of a converging lens. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The lens with greater curvature formed a sharp image at a shorter focal length when object distance was held constant. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that focal length is determined by optical power, which depends on curvature and refractive index. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

21. Which new result would most clearly distinguish the proposed explanation of lens formation from a competing mechanism?
- A. Independent focal-length measurements shift in the predicted direction.
 - B. Focal length is determined only by object brightness.
 - C. A curved interface cannot refract light.
 - D. Image distance is always equal to object distance.

22. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. A more strongly converging lens has a shorter focal length.
 - B. Focal length is determined only by object brightness.
 - C. A curved interface cannot refract light.
 - D. Image distance is always equal to object distance.
23. Which protocol would best isolate the effect of the curvature of a converging lens on lens formation?
- A. Keep object distance and refractive index constant.
 - B. Focal length is determined only by object brightness.
 - C. A curved interface cannot refract light.
 - D. Independent focal-length measurements shift in the predicted direction.
24. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. A more strongly converging lens has a shorter focal length.
 - B. A curved interface cannot refract light.
 - C. Focal length is determined only by object brightness.
 - D. Keep object distance and refractive index constant.

Passage 6: Electrochemistry

In a follow-up study of cell potential, investigators compared two conditions that differed in the concentration ratio of reaction species. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Changing the reaction quotient shifted the measured cell potential in the direction predicted by the Nernst relationship. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that the Nernst relationship includes the logarithm of the reaction quotient. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

25. Which new result would most clearly distinguish the proposed explanation of cell potential from a competing mechanism?
- A. Electron transfer cannot occur through the external circuit.
 - B. The voltage shifts predictably when the reaction quotient changes.
 - C. Cell voltage is fixed by electrode labels alone.
 - D. Ion concentration cannot affect cell potential.
26. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Electron transfer cannot occur through the external circuit.
 - B. Changing ion concentrations can change the measured cell voltage.
 - C. Cell voltage is fixed by electrode labels alone.

D. Ion concentration cannot affect cell potential.

27. Which protocol would best isolate the effect of the concentration ratio of reaction species on cell potential?

A. Use identical electrodes and temperature while varying only the solution composition.

B. Cell voltage is fixed by electrode labels alone.

C. Ion concentration cannot affect cell potential.

D. The voltage shifts predictably when the reaction quotient changes.

28. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?

A. Ion concentration cannot affect cell potential.

B. Changing ion concentrations can change the measured cell voltage.

C. Use identical electrodes and temperature while varying only the solution composition.

D. Cell voltage is fixed by electrode labels alone.

Passage 7: Fluid resistance

In a follow-up study of vascular flow, investigators compared two conditions that differed in the radius of a vessel. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Doubling vessel radius increased measured flow by much more than twofold when pressure difference and viscosity were fixed. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that the radius appears with a high power in the flow relationship. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

29. Which new result would most clearly distinguish the proposed explanation of vascular flow from a competing mechanism?

A. Flow is independent of vessel radius when pressure is fixed.

B. Viscosity cannot affect flow when radius changes.

C. Changing radius forces the pressure difference to reverse.

D. Measured flow rises more than proportionally as radius increases.

30. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?

A. Increasing radius increases flow when the pressure difference and viscosity remain fixed.

B. Flow is independent of vessel radius when pressure is fixed.

C. Viscosity cannot affect flow when radius changes.

D. Changing radius forces the pressure difference to reverse.

31. Which protocol would best isolate the effect of the radius of a vessel on vascular flow?

A. Measured flow rises more than proportionally as radius increases.

- B. Hold pressure difference, vessel length, and fluid viscosity constant.
- C. Flow is independent of vessel radius when pressure is fixed.
- D. Viscosity cannot affect flow when radius changes.

32. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?

- A. Increasing radius increases flow when the pressure difference and viscosity remain fixed.
- B. Hold pressure difference, vessel length, and fluid viscosity constant.
- C. Flow is independent of vessel radius when pressure is fixed.
- D. Viscosity cannot affect flow when radius changes.

Passage 8: Enzyme energetics

In a follow-up study of activation energy, investigators compared two conditions that differed in the concentration of catalyst. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The catalyzed reaction reached the same final product ratio sooner than the uncatalyzed reaction at the same temperature. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that the catalyst changes the pathway and rate but not the energy difference between reactants and products. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

33. Which new result would most clearly distinguish the proposed explanation of activation energy from a competing mechanism?

- A. A catalyst changes the equilibrium constant without changing the reaction conditions.
- B. Only the reverse reaction's activation barrier can be lowered.
- C. At equilibrium, the products disappear as quickly as they form.
- D. Both reaction directions speed up by comparable factors.

34. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?

- A. A catalyst changes the equilibrium constant without changing the reaction conditions.
- B. Only the reverse reaction's activation barrier can be lowered.
- C. At equilibrium, the products disappear as quickly as they form.
- D. The system reaches equilibrium sooner while the final equilibrium composition remains the same.

35. Which protocol would best isolate the effect of the concentration of catalyst on activation energy?

- A. Compare catalyzed and uncatalyzed reactions at the same temperature and starting concentrations.
- B. A catalyst changes the equilibrium constant without changing the reaction conditions.
- C. Only the reverse reaction's activation barrier can be lowered.
- D. Both reaction directions speed up by comparable factors.

36. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. The system reaches equilibrium sooner while the final equilibrium composition remains the same.
 - B. A catalyst changes the equilibrium constant without changing the reaction conditions.
 - C. Compare catalyzed and uncatalyzed reactions at the same temperature and starting concentrations.
 - D. Only the reverse reaction's activation barrier can be lowered.

Passage 9: Buffer chemistry

In a follow-up study of acid-base buffering, investigators compared two conditions that differed in the amount of added strong acid. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The buffered sample changed by 0.18 pH units after the acid addition, whereas the unbuffered comparison changed by 1.21 units. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that the conjugate base reacts with added hydrogen ion before free hydrogen ion accumulates. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

37. Which new result would most clearly distinguish the proposed explanation of acid-base buffering from a competing mechanism?
- A. The unbuffered control shows a much larger pH change.
 - B. The pH becomes exactly 7 after any amount of added acid.
 - C. A buffered sample changes pH by exactly the same amount as pure water.
 - D. Conjugate-base concentration has no bearing on the buffer's pH.
38. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. A buffered sample changes pH by exactly the same amount as pure water.
 - B. Conjugate-base concentration has no bearing on the buffer's pH.
 - C. The pH decreases only modestly after a small acid addition.
 - D. The pH becomes exactly 7 after any amount of added acid.
39. Which protocol would best isolate the effect of the amount of added strong acid on acid-base buffering?
- A. The unbuffered control shows a much larger pH change.
 - B. Compare equal-volume buffer samples receiving different known amounts of strong acid while keeping conjugate-base concentration and temperature fixed.
 - C. The pH becomes exactly 7 after any amount of added acid.
 - D. A buffered sample changes pH by exactly the same amount as pure water.
40. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. The pH becomes exactly 7 after any amount of added acid.
 - B. A buffered sample changes pH by exactly the same amount as pure water.

- C. The pH decreases only modestly after a small acid addition.
- D. Compare equal-volume buffer samples receiving different known amounts of strong acid while keeping conjugate-base concentration and temperature fixed.

Passage 10: Gas exchange

In a follow-up study of alveolar diffusion, investigators compared two conditions that differed in the partial-pressure gradient. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: At the larger gradient, oxygen-transfer rate was 18 percent higher while membrane thickness and surface area were unchanged. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that a larger gradient provides a larger driving force for net diffusion. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

- 41. Which new result would most clearly distinguish the proposed explanation of alveolar diffusion from a competing mechanism?
 - A. Membrane thickness cannot affect the rate of transfer.
 - B. A second sample with the same membrane shows the predicted increase.
 - C. A larger gradient guarantees unlimited transfer regardless of membrane properties.
 - D. The equilibrium constant changes solely because the gradient changes.
- 42. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
 - A. A larger gradient guarantees unlimited transfer regardless of membrane properties.
 - B. The equilibrium constant changes solely because the gradient changes.
 - C. Membrane thickness cannot affect the rate of transfer.
 - D. The rate of oxygen transfer into blood increases.
- 43. Which protocol would best isolate the effect of the partial-pressure gradient on alveolar diffusion?
 - A. Measure diffusion with membrane thickness held constant.
 - B. A larger gradient guarantees unlimited transfer regardless of membrane properties.
 - C. The equilibrium constant changes solely because the gradient changes.
 - D. A second sample with the same membrane shows the predicted increase.
- 44. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
 - A. The equilibrium constant changes solely because the gradient changes.
 - B. The rate of oxygen transfer into blood increases.
 - C. A larger gradient guarantees unlimited transfer regardless of membrane properties.
 - D. Measure diffusion with membrane thickness held constant.
- 45. A solution contains 0.75 mol of solute in 3.0 L. Its molarity is:
 - A. 0.40 M

- B. 2.25 M
- C. 4.0 M
- D. 0.25 M

46. A solution with pH 5 has approximately which hydrogen-ion concentration?

- A. 0.00001 M
- B. 5 M
- C. 100000 M
- D. 0.20 M

47. A 4.0 kg object moves at 2.0 m/s. Its kinetic energy is:

- A. 16 J
- B. 32 J
- C. 4 J
- D. 8 J

48. A 6.0 V source is connected to a 2.0 ohm resistor. The current is:

- A. 12 A
- B. 0.33 A
- C. 3.0 A
- D. 8.0 A

49. A catalyst is added to a system that has not yet reached equilibrium. Which statement is correct?

- A. The catalyst permanently removes reactants.
- B. Only products form faster.
- C. Both directions can speed up, but K remains unchanged.
- D. K changes because activation energy changes.

50. Hydrolysis of a peptide bond directly adds water across a bond between:

- A. Two nucleobases only
- B. An amino group and a carboxyl group
- C. Two phosphate groups
- D. Two hydrocarbon tails

51. If an ideal gas is compressed to one-half its original volume at constant temperature, its pressure will:

- A. Remain unchanged
- B. Become zero

- C. Be halved
 - D. Double
52. A 30 N force acts parallel to a displacement of 0.50 m. The work is:
- A. 15 J
 - B. 30 J
 - C. 60 J
 - D. 0 J
53. An oxidizing agent is reduced because it:
- A. Loses protons only
 - B. Gains electrons
 - C. Loses electrons
 - D. Gains neutrons
54. For a buffer containing comparable amounts of a weak acid and conjugate base, the pH is approximately:
- A. The pKa
 - B. Always 7
 - C. The pH of pure water
 - D. The concentration in molarity
55. The derivative of velocity with respect to time represents:
- A. Work
 - B. Power
 - C. Acceleration
 - D. Position
56. A molecule with polar bonds can be nonpolar overall when:
- A. Its atoms have identical masses
 - B. Its bond dipoles cancel because of molecular geometry
 - C. It contains no electrons
 - D. All bonds are ionic
57. A process with positive enthalpy change and negative entropy change is:
- A. Favorable only at high temperature
 - B. Unrelated to free energy
 - C. Unfavorable at every temperature

D. Favorable at every temperature

58. At pH equal to pKa, the ratio of conjugate base to weak acid is:

A. Dependent only on volume

B. 1

C. 10

D. 0.1

59. A cell is placed in a hypotonic solution containing a nonpenetrating solute. Water tends to:

A. Enter the cell

B. Leave the cell

C. Stop moving permanently

D. Move only into the nucleus

MCAT Critical Analysis and Reasoning Skills

Section timing: 90 minutes

Passage 1: Archives and absence

An archive is often imagined as a warehouse of everything a society has preserved. The author argues that it is better understood as a record of selection. Documents survive because institutions valued them, because materials were durable, or because researchers later found them useful. Absence cannot prove that an event did not occur, but it can reveal which lives were less likely to leave a trace. Readers should treat silence as a question rather than as evidence of emptiness. Responsible history supplements surviving records with attention to the mechanisms that shaped survival. The archive's silence is thus neither a hidden document nor proof of nonexistence. It is evidence about the conditions under which records become durable and discoverable. Researchers can ask who had access to writing, whose materials institutions preserved, and which categories later historians used to search. The absence becomes informative when connected to those mechanisms. The passage distinguishes silence in a record from proof of nonexistence. In the case of archives and absence, preservation mechanisms determine whose traces remain discoverable; this is why the author resists treating the first appearance of the issue as its complete meaning. For readers considering archives and absence, the point is not that the familiar description is false, but that it leaves out the condition that makes the description reliable or unreliable. The analysis of archives and absence then turns that distinction into a method. A reader must identify the purpose at stake, inspect the process by which the claimed effect occurs, and ask who or what bears the consequence. Here, preservation mechanisms determine whose traces remain discoverable. That observation does not settle every case, because an absent document can reveal an institution's priorities; it tells the reader what additional evidence or comparison is needed. The author therefore preserves a limited benefit while rejecting an unqualified generalization. The passage's standard is practical: connect missing evidence to the process that produced the archive, then revise the judgment if the relevant conditions differ. A reader who wants a simple rule about archives and absence might therefore find the conclusion unsatisfying. The author accepts that cost because overlooking silence in a record from proof of nonexistence can mistake a visible result for a complete evaluation. A stronger objection would have to show not merely that the practice sometimes works, but that the omitted condition does not alter the outcome in the cases under discussion. Conversely, a qualification is not a command to reject the practice. It is a request to compare concrete arrangements, identify their effects, and keep the argument answerable to evidence about archives and absence. The closing claim about archives and absence follows from that discipline of comparison. The author does not deny the initial observation; the author denies that it is sufficient by itself. For this topic, the decision-maker should connect missing evidence to the process that produced the archive when the audience, setting, timing, and distribution of burdens change. A conclusion that preserves these limits may sound less dramatic than a universal rule, but it travels better across new examples. The reader is left with a qualified principle: what is missing from a record may reflect the process of preservation, provided the conditions that make that principle meaningful remain visible.

60. Which statement best captures the author's central claim?
- A. The subject should be evaluated by a rule that ignores setting and consequence.
 - B. The existence of disagreement makes evaluation impossible.
 - C. A familiar description is sufficient evidence for a general conclusion.
 - D. a record's silence reflects selection as well as missing events
61. The examples in the passage primarily support which point?
- A. that the issue has no practical consequences
 - B. a contradiction the author never addresses
 - C. historical detail that does not change the argument
 - D. the archive example connects surviving traces to access, durability, and later search
62. The passage most strongly supports which inference?

- A. The author considers only the immediate viewpoint of the user or observer.
- B. absence becomes informative when linked to the mechanisms that produced the record
- C. A useful practice must be accepted without examining its distribution of effects.
- D. Any uncertainty prevents a responsible decision.

63. Which finding, if true, would require the author to revise the argument?

- A. the archive is demonstrably complete for this category and contains every event of this kind
- B. A reader reports a different preference without supplying a new condition.
- C. The opening example is repeated with the same evidence.
- D. The topic receives a new label but no new consequence.

64. A decision-maker applying the author's reasoning should:

- A. assume that one procedure distributes burdens equally
- B. use certainty of tone as a substitute for evidence
- C. supplement the archive by examining how preservation shaped what can now be known
- D. treat the first visible benefit as the entire evaluation

65. A historian finds no record of an event and investigates whose materials were preserved before concluding that the event never occurred. Which judgment best applies the passage's method?

- A. treated uncertainty as disproof
- B. used familiarity as evidence
- C. It treats the silence as evidence about preservation and access rather than as proof of nonexistence.
- D. ignored setting and consequence in favor of a simple rule

Passage 2: The ethics of convenience

Convenience is usually defended by the time it saves, but saved time is not a complete measure of benefit. A service may shift effort from a visible consumer to an invisible worker or from the present to the future through environmental cost. The author does not reject convenience; people reasonably value relief from exhausting tasks. The point is that convenience should be evaluated by the total pattern of burdens and benefits, including those ordinary accounting hides. A useful technology can still require an honest description of who pays for its ease. The author insists that a complete accounting must include displaced effort. A delivery service may save a customer time while intensifying a worker's schedule; a disposable product may simplify a task while transferring costs to waste systems. These examples do not show that convenience is bad. They show why a benefit cannot be evaluated from the viewpoint of the immediate user alone. The passage distinguishes immediate relief from total social benefit. In the case of the ethics of convenience, effort can be shifted from a visible customer to an invisible worker; this is why the author resists treating the first appearance of the issue as its complete meaning. For readers considering the ethics of convenience, the point is not that the familiar description is false, but that it leaves out the condition that makes the description reliable or unreliable. The analysis of the ethics of convenience then turns that distinction into a method. A reader must identify the purpose at stake, inspect the process by which the claimed effect occurs, and ask who or what bears the consequence. Here, effort can be shifted from a visible customer to an invisible worker. That observation does not settle every case, because a useful service can still externalize cost; it tells the reader what additional evidence or comparison is needed. The author therefore preserves a limited benefit while rejecting an unqualified generalization. The passage's standard is practical: count who pays for ease and when, then revise the judgment if the relevant conditions differ. A reader who wants a simple rule about the ethics of convenience might therefore find the conclusion unsatisfying. The author accepts that cost because overlooking immediate relief from total social benefit can mistake a visible result for a complete evaluation. A stronger objection would have to show not merely that the practice sometimes works, but that the omitted condition does not alter the outcome in the cases under discussion. Conversely, a qualification is not a command to reject the practice. It is a request to compare concrete arrangements, identify their effects, and keep the argument answerable to evidence about the ethics of convenience. The closing claim about the ethics of convenience follows from that discipline of comparison. The author does not deny the initial observation; the author denies that it is sufficient by itself. For this topic, the decision-maker should count who pays for ease and when when the audience, setting, timing, and distribution of burdens change. A conclusion that preserves these limits may sound less dramatic than a universal rule, but it travels better across new examples. The reader is left with a qualified principle: convenience should be evaluated by all distributed costs, provided the conditions that make that principle meaningful remain visible.

66. Which statement best captures the author's central claim?
- A. The subject should be evaluated by a rule that ignores setting and consequence.
 - B. The existence of disagreement makes evaluation impossible.
 - C. A familiar description is sufficient evidence for a general conclusion.
 - D. the value of convenience includes burdens shifted away from the immediate user
67. The examples in the passage primarily support which point?
- A. historical detail that does not change the argument
 - B. delivery and disposable-product examples reveal displaced labor and environmental cost
 - C. that the issue has no practical consequences
 - D. a contradiction the author never addresses
68. The passage most strongly supports which inference?
- A. a service can save time without producing an unqualified social benefit
 - B. A useful practice must be accepted without examining its distribution of effects.
 - C. Any uncertainty prevents a responsible decision.

D. The author considers only the immediate viewpoint of the user or observer.

69. Which finding, if true, would require the author to revise the argument?

A. a consumer's saved time measures the service's total benefit

B. A reader reports a different preference without supplying a new condition.

C. The opening example is repeated with the same evidence.

D. The topic receives a new label but no new consequence.

70. A decision-maker applying the author's reasoning should:

A. count who performs the hidden work and when the cost appears

B. treat the first visible benefit as the entire evaluation

C. assume that one procedure distributes burdens equally

D. use certainty of tone as a substitute for evidence

71. A delivery service saves customers time, but an evaluation also measures worker scheduling and waste-management burdens. Which judgment best applies the passage's method?

A. It counts benefits and displaced costs beyond the immediate user's experience.

B. ignored setting and consequence in favor of a simple rule

C. treated uncertainty as disproof

D. used familiarity as evidence

Passage 3: Taste and expertise

A critic claims that taste is purely personal and therefore cannot be argued about. The author grants that preference cannot be proven like a mathematical theorem but maintains that judgments can still be better or worse supported. Attention, comparison, and knowledge of a work's aims allow a critic to explain a response rather than merely announce it. Expertise does not eliminate disagreement; it changes the quality of reasons offered. Subjectivity and reason are not opposites when a judgment remains open to public examination. The critic's standard is not agreement but answerability. A judgment can be personal and still invite reasons, comparisons, and correction. Expertise matters because it expands the range of relevant distinctions, not because it grants immunity from disagreement. The passage consequently treats discussion as a way of improving judgment rather than eliminating preference. The passage distinguishes personal response from unsupported assertion. In the case of taste and expertise, comparison and knowledge expand the reasons a critic can offer; this is why the author resists treating the first appearance of the issue as its complete meaning. For readers considering taste and expertise, the point is not that the familiar description is false, but that it leaves out the condition that makes the description reliable or unreliable. The analysis of taste and expertise then turns that distinction into a method. A reader must identify the purpose at stake, inspect the process by which the claimed effect occurs, and ask who or what bears the consequence. Here, comparison and knowledge expand the reasons a critic can offer. That observation does not settle every case, because expertise does not remove disagreement; it tells the reader what additional evidence or comparison is needed. The author therefore preserves a limited benefit while rejecting an unqualified generalization. The passage's standard is practical: judge a claim by its answerability to public reasons, then revise the judgment if the relevant conditions differ. A reader who wants a simple rule about taste and expertise might therefore find the conclusion unsatisfying. The author accepts that cost because overlooking personal response from unsupported assertion can mistake a visible result for a complete evaluation. A stronger objection would have to show not merely that the practice sometimes works, but that the omitted condition does not alter the outcome in the cases under discussion. Conversely, a qualification is not a command to reject the practice. It is a request to compare concrete arrangements, identify their effects, and keep the argument answerable to evidence about taste and expertise. The closing claim about taste and expertise follows from that discipline of comparison. The author does not deny the initial observation; the author denies that it is sufficient by itself. For this topic, the decision-maker should judge a claim by its answerability to public reasons when the audience, setting, timing, and distribution of burdens change. A conclusion that preserves these limits may sound less dramatic than a universal rule, but it travels better across new examples. The reader is left with a qualified principle: subjective judgment can still be reasoned and explained, provided the conditions that make that principle meaningful remain visible.

72. Which statement best captures the author's central claim?

- A. A familiar description is sufficient evidence for a general conclusion.
- B. subjective judgment can still be supported by public reasons
- C. The subject should be evaluated by a rule that ignores setting and consequence.
- D. The existence of disagreement makes evaluation impossible.

73. The examples in the passage primarily support which point?

- A. a contradiction the author never addresses
- B. historical detail that does not change the argument
- C. the critic's comparison shows that expertise improves explanation without requiring agreement
- D. that the issue has no practical consequences

74. The passage most strongly supports which inference?

- A. A useful practice must be accepted without examining its distribution of effects.
- B. Any uncertainty prevents a responsible decision.
- C. The author considers only the immediate viewpoint of the user or observer.

D. disagreement is compatible with better and worse accounts of a work's aims

75. Which finding, if true, would require the author to revise the argument?

- A. A reader reports a different preference without supplying a new condition.
- B. The opening example is repeated with the same evidence.
- C. The topic receives a new label but no new consequence.
- D. a reasoned judgment must become objective proof

76. A decision-maker applying the author's reasoning should:

- A. use certainty of tone as a substitute for evidence
- B. evaluate the quality and answerability of the distinctions offered
- C. treat the first visible benefit as the entire evaluation
- D. assume that one procedure distributes burdens equally

77. Two critics disagree about a novel, but one gives specific comparisons that the other can challenge or refine. Which judgment best applies the passage's method?

- A. treated uncertainty as disproof
- B. used familiarity as evidence
- C. It treats a judgment as subjective yet answerable to public reasons rather than as either proof or mere preference.
- D. ignored setting and consequence in favor of a simple rule

Passage 4: Urban green space

A city plants trees partly to improve appearance, but greenery also changes how residents use public space. Shade can lengthen visits, and a comfortable street may invite walking rather than driving. Yet beautification can raise rents and displace residents who made a neighborhood vibrant. Green space is therefore not automatically egalitarian. Its benefits depend on who can remain and who participates in design decisions. The author supports planting but rejects the assumption that environmental improvement has only positive social effects. The author asks planners to treat distribution as part of environmental success. A park can improve air, shade, and public life while also increasing the price of remaining nearby. The relevant comparison is not between trees and no trees in the abstract, but between designs that share benefits and designs that make the original community unable to enjoy them. The passage distinguishes environmental improvement from equal access to its benefits. In the case of urban green space, design and housing pressure determine who can remain nearby; this is why the author resists treating the first appearance of the issue as its complete meaning. For readers considering urban green space, the point is not that the familiar description is false, but that it leaves out the condition that makes the description reliable or unreliable. The analysis of urban green space then turns that distinction into a method. A reader must identify the purpose at stake, inspect the process by which the claimed effect occurs, and ask who or what bears the consequence. Here, design and housing pressure determine who can remain nearby. That observation does not settle every case, because a park can improve air while displacing the people who built community there; it tells the reader what additional evidence or comparison is needed. The author therefore preserves a limited benefit while rejecting an unqualified generalization. The passage's standard is practical: include distribution in the definition of environmental success, then revise the judgment if the relevant conditions differ. A reader who wants a simple rule about urban green space might therefore find the conclusion unsatisfying. The author accepts that cost because overlooking environmental improvement from equal access to its benefits can mistake a visible result for a complete evaluation. A stronger objection would have to show not merely that the practice sometimes works, but that the omitted condition does not alter the outcome in the cases under discussion. Conversely, a qualification is not a command to reject the practice. It is a request to compare concrete arrangements, identify their effects, and keep the argument answerable to evidence about urban green space. The closing claim about urban green space follows from that discipline of comparison. The author does not deny the initial observation; the author denies that it is sufficient by itself. For this topic, the decision-maker should include distribution in the definition of environmental success when the audience, setting, timing, and distribution of burdens change. A conclusion that preserves these limits may sound less dramatic than a universal rule, but it travels better across new examples. The reader is left with a qualified principle: urban environmental benefits must be evaluated with displacement risks, provided the conditions that make that principle meaningful remain visible.

78. Which statement best captures the author's central claim?
- A. The existence of disagreement makes evaluation impossible.
 - B. A familiar description is sufficient evidence for a general conclusion.
 - C. environmental benefits depend on who can remain and participate
 - D. The subject should be evaluated by a rule that ignores setting and consequence.
79. The examples in the passage primarily support which point?
- A. that the issue has no practical consequences
 - B. a contradiction the author never addresses
 - C. historical detail that does not change the argument
 - D. the tree-planting example connects shade and walking to rent pressure and displacement
80. The passage most strongly supports which inference?
- A. Any uncertainty prevents a responsible decision.
 - B. The author considers only the immediate viewpoint of the user or observer.
 - C. a park's success cannot be measured only by its physical improvement

D. A useful practice must be accepted without examining its distribution of effects.

81. Which finding, if true, would require the author to revise the argument?

- A. any rent increase makes planting environmentally harmful
- B. A reader reports a different preference without supplying a new condition.
- C. The opening example is repeated with the same evidence.
- D. The topic receives a new label but no new consequence.

82. A decision-maker applying the author's reasoning should:

- A. compare the design that creates benefits with the distribution of access to them
- B. treat the first visible benefit as the entire evaluation
- C. assume that one procedure distributes burdens equally
- D. use certainty of tone as a substitute for evidence

83. A city adds a park while protecting nearby affordable housing and tracking who can continue to use the area. Which judgment best applies the passage's method?

- A. ignored setting and consequence in favor of a simple rule
- B. treated uncertainty as disproof
- C. used familiarity as evidence
- D. It measures environmental success together with the distribution of access and displacement risk.

Passage 5: The limits of averages

An average can summarize a group while obscuring the spread of individual experiences. An average commute does not describe workers whose journeys are much longer or less reliable. This does not make averages useless; planners need summaries to see broad patterns. The problem arises when a summary is mistaken for a typical person. The author recommends pairing averages with distributions and with unusual cases that may expose a policy's hidden weakness. A good statistic organizes attention; it should not end it. A distribution can reveal whether an average represents a cluster or hides a sharp division. Unusual cases are not merely anecdotes when they expose a mechanism that the average conceals. The author therefore treats summary and detail as complementary: one locates a pattern, while the other tests how that pattern is lived and where it fails. The passage distinguishes a group summary from a typical individual. In the case of the limits of averages, a distribution shows whether a mean hides a sharp division; this is why the author resists treating the first appearance of the issue as its complete meaning. For readers considering the limits of averages, the point is not that the familiar description is false, but that it leaves out the condition that makes the description reliable or unreliable. The analysis of the limits of averages then turns that distinction into a method. A reader must identify the purpose at stake, inspect the process by which the claimed effect occurs, and ask who or what bears the consequence. Here, a distribution shows whether a mean hides a sharp division. That observation does not settle every case, because an unusual case can expose a mechanism rather than merely decorate a statistic; it tells the reader what additional evidence or comparison is needed. The author therefore preserves a limited benefit while rejecting an unqualified generalization. The passage's standard is practical: pair summary with lived variation, then revise the judgment if the relevant conditions differ. A reader who wants a simple rule about the limits of averages might therefore find the conclusion unsatisfying. The author accepts that cost because overlooking a group summary from a typical individual can mistake a visible result for a complete evaluation. A stronger objection would have to show not merely that the practice sometimes works, but that the omitted condition does not alter the outcome in the cases under discussion. Conversely, a qualification is not a command to reject the practice. It is a request to compare concrete arrangements, identify their effects, and keep the argument answerable to evidence about the limits of averages. The closing claim about the limits of averages follows from that discipline of comparison. The author does not deny the initial observation; the author denies that it is sufficient by itself. For this topic, the decision-maker should pair summary with lived variation when the audience, setting, timing, and distribution of burdens change. A conclusion that preserves these limits may sound less dramatic than a universal rule, but it travels better across new examples. The reader is left with a qualified principle: summary statistics need distributions and cases to guide interpretation, provided the conditions that make that principle meaningful remain visible.

84. Which statement best captures the author's central claim?

- A. The existence of disagreement makes evaluation impossible.
- B. A familiar description is sufficient evidence for a general conclusion.
- C. summary statistics organize attention but do not replace distributions
- D. The subject should be evaluated by a rule that ignores setting and consequence.

85. The examples in the passage primarily support which point?

- A. that the issue has no practical consequences
- B. a contradiction the author never addresses
- C. historical detail that does not change the argument
- D. the commute example shows why an average can hide a long or unstable burden

86. The passage most strongly supports which inference?

- A. Any uncertainty prevents a responsible decision.
- B. The author considers only the immediate viewpoint of the user or observer.
- C. an unusual case can reveal the mechanism behind a group pattern

D. A useful practice must be accepted without examining its distribution of effects.

87. Which finding, if true, would require the author to revise the argument?

- A. an average is useless whenever individual experiences differ
- B. A reader reports a different preference without supplying a new condition.
- C. The opening example is repeated with the same evidence.
- D. The topic receives a new label but no new consequence.

88. A decision-maker applying the author's reasoning should:

- A. use certainty of tone as a substitute for evidence
- B. pair the aggregate pattern with variation that tests where the summary fails
- C. treat the first visible benefit as the entire evaluation
- D. assume that one procedure distributes burdens equally

89. A transit agency reports the mean commute and also publishes the full spread and the experiences of riders with the longest trips. Which judgment best applies the passage's method?

- A. ignored setting and consequence in favor of a simple rule
- B. treated uncertainty as disproof
- C. used familiarity as evidence
- D. It uses the summary to locate a pattern and variation to test where that summary hides a mechanism.

Passage 6: Patience in science

Scientific patience is sometimes confused with passive waiting. The author describes it instead as an active willingness to keep a question open while improving measurements and testing alternatives. A researcher may suspend a favored explanation without suspending judgment altogether. This protects inquiry from premature certainty, but it also requires decisions about when evidence is adequate for action. Patience is thus a discipline of proportion: neither rushing to a conclusion nor treating uncertainty as a reason to do nothing. The passage's patience is active because the researcher continues to improve the question. Waiting without measurement leaves uncertainty untouched; acting without adequate evidence confuses urgency with knowledge. The author proposes a middle discipline in which provisional decisions remain open to specified signs that would justify revision. The passage distinguishes active restraint from passive delay. In the case of patience in science, measurement and alternative testing keep an open question productive; this is why the author resists treating the first appearance of the issue as its complete meaning. For readers considering patience in science, the point is not that the familiar description is false, but that it leaves out the condition that makes the description reliable or unreliable. The analysis of patience in science then turns that distinction into a method. A reader must identify the purpose at stake, inspect the process by which the claimed effect occurs, and ask who or what bears the consequence. Here, measurement and alternative testing keep an open question productive. That observation does not settle every case, because uncertainty can justify a provisional decision without ending inquiry; it tells the reader what additional evidence or comparison is needed. The author therefore preserves a limited benefit while rejecting an unqualified generalization. The passage's standard is practical: specify what evidence would trigger revision, then revise the judgment if the relevant conditions differ. A reader who wants a simple rule about patience in science might therefore find the conclusion unsatisfying. The author accepts that cost because overlooking active restraint from passive delay can mistake a visible result for a complete evaluation. A stronger objection would have to show not merely that the practice sometimes works, but that the omitted condition does not alter the outcome in the cases under discussion. Conversely, a qualification is not a command to reject the practice. It is a request to compare concrete arrangements, identify their effects, and keep the argument answerable to evidence about patience in science. The closing claim about patience in science follows from that discipline of comparison. The author does not deny the initial observation; the author denies that it is sufficient by itself. For this topic, the decision-maker should specify what evidence would trigger revision when the audience, setting, timing, and distribution of burdens change. A conclusion that preserves these limits may sound less dramatic than a universal rule, but it travels better across new examples. The reader is left with a qualified principle: scientific patience combines restraint with continued evaluation, provided the conditions that make that principle meaningful remain visible.

90. Which statement best captures the author's central claim?

- A. The subject should be evaluated by a rule that ignores setting and consequence.
- B. The existence of disagreement makes evaluation impossible.
- C. A familiar description is sufficient evidence for a general conclusion.
- D. waiting can be an active practice of improving evidence

91. The examples in the passage primarily support which point?

- A. a contradiction the author never addresses
- B. historical detail that does not change the argument
- C. the researcher's open question shows how measurement and alternative tests differ from passivity
- D. that the issue has no practical consequences

92. The passage most strongly supports which inference?

- A. uncertainty can support provisional action when the revision trigger is specified
- B. A useful practice must be accepted without examining its distribution of effects.
- C. Any uncertainty prevents a responsible decision.

D. The author considers only the immediate viewpoint of the user or observer.

93. Which finding, if true, would require the author to revise the argument?

A. A reader reports a different preference without supplying a new condition.

B. The opening example is repeated with the same evidence.

C. The topic receives a new label but no new consequence.

D. uncertainty is a reason to avoid every decision

94. A decision-maker applying the author's reasoning should:

A. treat the first visible benefit as the entire evaluation

B. assume that one procedure distributes burdens equally

C. use certainty of tone as a substitute for evidence

D. balance the need to act with evidence that would justify changing course

95. A research team delays a strong conclusion, collects a second measure, and states what result would trigger a change in its working model. Which judgment best applies the passage's method?

A. used familiarity as evidence

B. It treats waiting as active evidence improvement rather than as passive avoidance of a decision.

C. ignored setting and consequence in favor of a simple rule

D. treated uncertainty as disproof

Passage 7: The theater of expertise

Public experts are often expected to speak with certainty when audiences want a clear answer. The author argues that expertise is more valuable when it makes uncertainty legible. A forecast can state its assumptions, likely range, and warning signs without surrendering authority. This differs from evasive vagueness because uncertainty must be specific enough to guide a decision. Expertise should be judged not by confidence of tone alone but by the quality of reasoning made visible. Specific uncertainty can strengthen rather than weaken a forecast. An audience can evaluate assumptions, ranges, and warning signs, then decide how much confidence a decision warrants. The author contrasts this practice with theatrical certainty, which sounds decisive but gives no account of what would count against the prediction. The passage distinguishes legible uncertainty from evasive vagueness. In the case of the theater of expertise, assumptions, ranges, and warning signs let an audience judge a forecast; this is why the author resists treating the first appearance of the issue as its complete meaning. For readers considering the theater of expertise, the point is not that the familiar description is false, but that it leaves out the condition that makes the description reliable or unreliable. The analysis of the theater of expertise then turns that distinction into a method. A reader must identify the purpose at stake, inspect the process by which the claimed effect occurs, and ask who or what bears the consequence. Here, assumptions, ranges, and warning signs let an audience judge a forecast. That observation does not settle every case, because confidence of tone is weaker than visible reasoning; it tells the reader what additional evidence or comparison is needed. The author therefore preserves a limited benefit while rejecting an unqualified generalization. The passage's standard is practical: ask what would count against the prediction, then revise the judgment if the relevant conditions differ. A reader who wants a simple rule about the theater of expertise might therefore find the conclusion unsatisfying. The author accepts that cost because overlooking legible uncertainty from evasive vagueness can mistake a visible result for a complete evaluation. A stronger objection would have to show not merely that the practice sometimes works, but that the omitted condition does not alter the outcome in the cases under discussion. Conversely, a qualification is not a command to reject the practice. It is a request to compare concrete arrangements, identify their effects, and keep the argument answerable to evidence about the theater of expertise. The closing claim about the theater of expertise follows from that discipline of comparison. The author does not deny the initial observation; the author denies that it is sufficient by itself. For this topic, the decision-maker should ask what would count against the prediction when the audience, setting, timing, and distribution of burdens change. A conclusion that preserves these limits may sound less dramatic than a universal rule, but it travels better across new examples. The reader is left with a qualified principle: credible expertise explains uncertainty rather than performing certainty, provided the conditions that make that principle meaningful remain visible.

96. Which statement best captures the author's central claim?

- A. The subject should be evaluated by a rule that ignores setting and consequence.
- B. The existence of disagreement makes evaluation impossible.
- C. A familiar description is sufficient evidence for a general conclusion.
- D. specific uncertainty can strengthen rather than weaken expertise

97. The examples in the passage primarily support which point?

- A. that the issue has no practical consequences
- B. a contradiction the author never addresses
- C. historical detail that does not change the argument
- D. the forecast example shows how assumptions and warning signs make confidence inspectable

98. The passage most strongly supports which inference?

- A. The author considers only the immediate viewpoint of the user or observer.
- B. a confident tone without a revision condition gives less guidance than a qualified range
- C. A useful practice must be accepted without examining its distribution of effects.

D. Any uncertainty prevents a responsible decision.

99. Which finding, if true, would require the author to revise the argument?

- A. The topic receives a new label but no new consequence.
- B. a forecast is evasive whenever it states a range
- C. A reader reports a different preference without supplying a new condition.
- D. The opening example is repeated with the same evidence.

100. A decision-maker applying the author's reasoning should:

- A. ask what assumptions and observations would count against the prediction
- B. treat the first visible benefit as the entire evaluation
- C. assume that one procedure distributes burdens equally
- D. use certainty of tone as a substitute for evidence

101. A forecaster gives a range, lists its assumptions, and identifies warning signs that would make the forecast less reliable. Which judgment best applies the passage's method?

- A. used familiarity as evidence
- B. It makes confidence inspectable by connecting the prediction to assumptions and revision conditions.
- C. ignored setting and consequence in favor of a simple rule
- D. treated uncertainty as disproof

Passage 8: Repair and replacement

A broken object invites a choice between repair and replacement. The author treats the choice as cultural as well as economic. Repair preserves knowledge of materials and use, while replacement may offer safety or efficiency. Neither option deserves romantic treatment. An object should be repaired when repair keeps its function without unreasonable risk, but replacement can be wasteful when it reflects impatience with visible wear. Maintenance is a form of attention that modern systems often undervalue. Repair is valuable here because it preserves attention, not because old objects are always superior. A repair that creates danger or cannot restore the needed function is not virtuous. The author wants decisions to account for material knowledge, risk, and use instead of treating replacement as the default response to visible imperfection. The passage distinguishes maintenance as attention from nostalgia for old objects. In the case of repair and replacement, function, material knowledge, and risk determine whether repair is responsible; this is why the author resists treating the first appearance of the issue as its complete meaning. For readers considering repair and replacement, the point is not that the familiar description is false, but that it leaves out the condition that makes the description reliable or unreliable. The analysis of repair and replacement then turns that distinction into a method. A reader must identify the purpose at stake, inspect the process by which the claimed effect occurs, and ask who or what bears the consequence. Here, function, material knowledge, and risk determine whether repair is responsible. That observation does not settle every case, because replacement can be wasteful but repair can also be unsafe; it tells the reader what additional evidence or comparison is needed. The author therefore preserves a limited benefit while rejecting an unqualified generalization. The passage's standard is practical: compare options against use rather than habit, then revise the judgment if the relevant conditions differ. A reader who wants a simple rule about repair and replacement might therefore find the conclusion unsatisfying. The author accepts that cost because overlooking maintenance as attention from nostalgia for old objects can mistake a visible result for a complete evaluation. A stronger objection would have to show not merely that the practice sometimes works, but that the omitted condition does not alter the outcome in the cases under discussion. Conversely, a qualification is not a command to reject the practice. It is a request to compare concrete arrangements, identify their effects, and keep the argument answerable to evidence about repair and replacement. The closing claim about repair and replacement follows from that discipline of comparison. The author does not deny the initial observation; the author denies that it is sufficient by itself. For this topic, the decision-maker should compare options against use rather than habit when the audience, setting, timing, and distribution of burdens change. A conclusion that preserves these limits may sound less dramatic than a universal rule, but it travels better across new examples. The reader is left with a qualified principle: repair decisions require function, risk, and attention rather than habit, provided the conditions that make that principle meaningful remain visible.

102. Which statement best captures the author's central claim?
- A. The existence of disagreement makes evaluation impossible.
 - B. A familiar description is sufficient evidence for a general conclusion.
 - C. maintenance decisions depend on function and risk rather than nostalgia or impatience
 - D. The subject should be evaluated by a rule that ignores setting and consequence.
103. The examples in the passage primarily support which point?
- A. a contradiction the author never addresses
 - B. historical detail that does not change the argument
 - C. the broken-object example weighs restored use against safety and efficiency
 - D. that the issue has no practical consequences
104. The passage most strongly supports which inference?
- A. Any uncertainty prevents a responsible decision.
 - B. The author considers only the immediate viewpoint of the user or observer.

- C. replacement can waste material while repair can still be irresponsible when it cannot restore function
- D. A useful practice must be accepted without examining its distribution of effects.

105. Which finding, if true, would require the author to revise the argument?

- A. The topic receives a new label but no new consequence.
- B. repair is always more attentive than replacement
- C. A reader reports a different preference without supplying a new condition.
- D. The opening example is repeated with the same evidence.

106. A decision-maker applying the author's reasoning should:

- A. assume that one procedure distributes burdens equally
- B. use certainty of tone as a substitute for evidence
- C. compare the options against the object's needed use and the risks each creates
- D. treat the first visible benefit as the entire evaluation

107. An old device can be repaired, but the repair would create a safety risk and still fail the device's required function. Which judgment best applies the passage's method?

- A. treated uncertainty as disproof
- B. used familiarity as evidence
- C. It compares repair and replacement by use, material, and risk rather than treating either option as automatically virtuous.
- D. ignored setting and consequence in favor of a simple rule

Passage 9: Language and belonging

A language community can welcome newcomers by teaching shared expressions, but one way of speaking should not become the sole proof of membership. Accent and vocabulary may carry history, yet belonging also grows through participation and mutual recognition. Common language can coordinate action; the concern is that correction becomes exclusion when it ranks people rather than clarifying meaning. The author favors a flexible standard that preserves intelligibility without confusing uniformity with community. The author separates coordination from conformity. Shared expressions can make a conversation easier, but a community becomes exclusionary when linguistic correction is used to rank speakers rather than clarify a meaning. Flexible standards can preserve intelligibility while allowing belonging to develop through participation and mutual recognition. The passage distinguishes coordination from conformity. In the case of language and belonging, shared expressions can clarify meaning without ranking speakers; this is why the author resists treating the first appearance of the issue as its complete meaning. For readers considering language and belonging, the point is not that the familiar description is false, but that it leaves out the condition that makes the description reliable or unreliable. The analysis of language and belonging then turns that distinction into a method. A reader must identify the purpose at stake, inspect the process by which the claimed effect occurs, and ask who or what bears the consequence. Here, shared expressions can clarify meaning without ranking speakers. That observation does not settle every case, because correction becomes exclusion when it polices membership; it tells the reader what additional evidence or comparison is needed. The author therefore preserves a limited benefit while rejecting an unqualified generalization. The passage's standard is practical: preserve intelligibility while allowing participation to create belonging, then revise the judgment if the relevant conditions differ. A reader who wants a simple rule about language and belonging might therefore find the conclusion unsatisfying. The author accepts that cost because overlooking coordination from conformity can mistake a visible result for a complete evaluation. A stronger objection would have to show not merely that the practice sometimes works, but that the omitted condition does not alter the outcome in the cases under discussion. Conversely, a qualification is not a command to reject the practice. It is a request to compare concrete arrangements, identify their effects, and keep the argument answerable to evidence about language and belonging. The closing claim about language and belonging follows from that discipline of comparison. The author does not deny the initial observation; the author denies that it is sufficient by itself. For this topic, the decision-maker should preserve intelligibility while allowing participation to create belonging when the audience, setting, timing, and distribution of burdens change. A conclusion that preserves these limits may sound less dramatic than a universal rule, but it travels better across new examples. The reader is left with a qualified principle: shared language can coordinate belonging without requiring uniform speech, provided the conditions that make that principle meaningful remain visible.

108. Which statement best captures the author's central claim?
- A. shared language can coordinate action without making uniform speech a membership test
 - B. The subject should be evaluated by a rule that ignores setting and consequence.
 - C. The existence of disagreement makes evaluation impossible.
 - D. A familiar description is sufficient evidence for a general conclusion.
109. The examples in the passage primarily support which point?
- A. the correction example distinguishes clarifying meaning from ranking speakers
 - B. that the issue has no practical consequences
 - C. a contradiction the author never addresses
 - D. historical detail that does not change the argument
110. The passage most strongly supports which inference?
- A. A useful practice must be accepted without examining its distribution of effects.
 - B. Any uncertainty prevents a responsible decision.
 - C. The author considers only the immediate viewpoint of the user or observer.

D. a flexible standard can preserve intelligibility while participation builds belonging

111. Which finding, if true, would require the author to revise the argument?

- A. The topic receives a new label but no new consequence.
- B. a common language requires one accepted accent and vocabulary
- C. A reader reports a different preference without supplying a new condition.
- D. The opening example is repeated with the same evidence.

112. A decision-maker applying the author's reasoning should:

- A. use certainty of tone as a substitute for evidence
- B. separate the communicative purpose of a standard from its use as social gatekeeping
- C. treat the first visible benefit as the entire evaluation
- D. assume that one procedure distributes burdens equally

MCAT Biological and Biochemical Foundations of Living Systems

Section timing: 95 minutes

Passage 1: Evolution

In a follow-up study of selection, investigators compared two conditions that differed in the frequency of a heritable trait under an environmental pressure. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The heritable phenotype became more common only in populations exposed to the stated selective pressure. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that differential reproductive success shifts the distribution of heritable variants. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

113. Which new result would most clearly distinguish the proposed explanation of selection from a competing mechanism?
- A. Individuals acquire directed mutations because they need them.
 - B. Natural selection changes only an individual during its lifetime.
 - C. All genetic variation is harmful to a population.
 - D. The trait is heritable and correlated with offspring number.
114. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. All genetic variation is harmful to a population.
 - B. The advantageous phenotype increases in frequency when the pressure persists.
 - C. Individuals acquire directed mutations because they need them.
 - D. Natural selection changes only an individual during its lifetime.
115. Which protocol would best isolate the effect of the frequency of a heritable trait under an environmental pressure on selection?
- A. Compare with a population lacking the selective pressure.
 - B. Individuals acquire directed mutations because they need them.
 - C. Natural selection changes only an individual during its lifetime.
 - D. The trait is heritable and correlated with offspring number.
116. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Natural selection changes only an individual during its lifetime.
 - B. Individuals acquire directed mutations because they need them.
 - C. Compare with a population lacking the selective pressure.
 - D. The advantageous phenotype increases in frequency when the pressure persists.
117. Which observation would be most inconsistent with the proposed explanation of selection?

- A. The trait is heritable and correlated with offspring number.
- B. The advantageous phenotype increases in frequency when the pressure persists.
- C. Natural selection changes population frequencies, not because individuals choose to adapt.
- D. Individuals acquire directed mutations because they need them.

Passage 2: Cell cycle

In a follow-up study of checkpoint control, investigators compared two conditions that differed in DNA damage before division. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: A DNA-damage signal increased checkpoint-protein activity before cells entered the next division phase. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that checkpoints protect genome integrity by delaying division or triggering repair or death. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

118. Which new result would most clearly distinguish the proposed explanation of checkpoint control from a competing mechanism?
- A. The cell cycle has no checkpoints that can delay progression.
 - B. DNA damage changes only the cell membrane and not nuclear control.
 - C. A checkpoint protein becomes active before division is delayed.
 - D. DNA damage always accelerates cell division.
119. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. DNA damage changes only the cell membrane and not nuclear control.
 - B. Cells with damage spend longer before entering the next phase.
 - C. DNA damage always accelerates cell division.
 - D. The cell cycle has no checkpoints that can delay progression.
120. Which protocol would best isolate the effect of DNA damage before division on checkpoint control?
- A. The cell cycle has no checkpoints that can delay progression.
 - B. A checkpoint protein becomes active before division is delayed.
 - C. Compare damaged and undamaged cells with the same growth factors.
 - D. DNA damage always accelerates cell division.
121. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Cells with damage spend longer before entering the next phase.
 - B. DNA damage always accelerates cell division.
 - C. Compare damaged and undamaged cells with the same growth factors.
 - D. The cell cycle has no checkpoints that can delay progression.

122. Which observation would be most inconsistent with the proposed explanation of checkpoint control?
- A. DNA damage always accelerates cell division.
 - B. A checkpoint protein becomes active before division is delayed.
 - C. Cells with damage spend longer before entering the next phase.
 - D. Loss of checkpoint function can increase mutation accumulation.

Passage 3: Immune response

In a follow-up study of clonal selection, investigators compared two conditions that differed in exposure to a specific antigen. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The second antigen exposure produced a faster response and a larger concentration of antigen-specific antibody. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that selection and proliferation amplify cells with matching receptors. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

123. Which new result would most clearly distinguish the proposed explanation of clonal selection from a competing mechanism?
- A. Red blood cells are the primary source of antibodies.
 - B. Memory formation requires destruction of all antigen receptors.
 - C. A second exposure produces a faster and larger response.
 - D. Every lymphocyte responds identically to every antigen.
124. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Memory formation requires destruction of all antigen receptors.
 - B. The frequency of antigen-specific clones increases after exposure.
 - C. Every lymphocyte responds identically to every antigen.
 - D. Red blood cells are the primary source of antibodies.
125. Which protocol would best isolate the effect of exposure to a specific antigen on clonal selection?
- A. Red blood cells are the primary source of antibodies.
 - B. A second exposure produces a faster and larger response.
 - C. Compare antigen-specific and unrelated lymphocyte populations.
 - D. Every lymphocyte responds identically to every antigen.
126. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Compare antigen-specific and unrelated lymphocyte populations.
 - B. The frequency of antigen-specific clones increases after exposure.
 - C. Red blood cells are the primary source of antibodies.
 - D. Every lymphocyte responds identically to every antigen.

127. Which observation would be most inconsistent with the proposed explanation of clonal selection?
- A. Memory cells can support a faster response after later exposure.
 - B. Every lymphocyte responds identically to every antigen.
 - C. A second exposure produces a faster and larger response.
 - D. The frequency of antigen-specific clones increases after exposure.

Passage 4: Metabolism

In a follow-up study of oxidative phosphorylation, investigators compared two conditions that differed in the proton gradient across the inner mitochondrial membrane. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Increasing the usable proton gradient increased ATP output until oxygen delivery became limiting. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that the gradient stores electrochemical energy used by ATP synthase. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

128. Which new result would most clearly distinguish the proposed explanation of oxidative phosphorylation from a competing mechanism?
- A. A protonophore lowers ATP output while oxygen consumption initially changes.
 - B. ATP synthase can produce ATP without the proton gradient in this model.
 - C. The inner mitochondrial membrane generates oxygen as its primary product.
 - D. The proton gradient exists only in the nucleus.
129. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. ATP synthase can produce ATP without the proton gradient in this model.
 - B. The inner mitochondrial membrane generates oxygen as its primary product.
 - C. The proton gradient exists only in the nucleus.
 - D. Increasing the proton gradient increases ATP production until another component becomes limiting.
130. Which protocol would best isolate the effect of the proton gradient across the inner mitochondrial membrane on oxidative phosphorylation?
- A. The inner mitochondrial membrane generates oxygen as its primary product.
 - B. A protonophore lowers ATP output while oxygen consumption initially changes.
 - C. Maintain oxygen and substrate while varying the gradient within the system's operating range.
 - D. ATP synthase can produce ATP without the proton gradient in this model.
131. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. The inner mitochondrial membrane generates oxygen as its primary product.

- B. Increasing the proton gradient increases ATP production until another component becomes limiting.
 - C. ATP synthase can produce ATP without the proton gradient in this model.
 - D. Maintain oxygen and substrate while varying the gradient within the system's operating range.
132. Which observation would be most inconsistent with the proposed explanation of oxidative phosphorylation?
- A. Electron transport and ATP synthesis are coupled through proton movement.
 - B. ATP synthase can produce ATP without the proton gradient in this model.
 - C. A protonophore lowers ATP output while oxygen consumption initially changes.
 - D. Increasing the proton gradient increases ATP production until another component becomes limiting.

Passage 5: Genetics

In a follow-up study of linkage, investigators compared two conditions that differed in the distance between loci. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The recombinant fraction was larger for the more distant pair of loci in the three-point cross. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that crossing over is more likely between loci that are farther apart. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

133. Which new result would most clearly distinguish the proposed explanation of linkage from a competing mechanism?
- A. Recombination frequency is unrelated to the distance between loci.
 - B. Every offspring produced by a linked cross is recombinant.
 - C. A three-point cross places the loci in the predicted order.
 - D. Linked loci always segregate together without recombination.
134. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Every offspring produced by a linked cross is recombinant.
 - B. More distant loci produce a larger fraction of recombinant gametes.
 - C. Linked loci always segregate together without recombination.
 - D. Recombination frequency is unrelated to the distance between loci.
135. Which protocol would best isolate the effect of the distance between loci on linkage?
- A. Use the same heterozygous parent and score many offspring.
 - B. Linked loci always segregate together without recombination.
 - C. Recombination frequency is unrelated to the distance between loci.
 - D. A three-point cross places the loci in the predicted order.

136. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Linked loci always segregate together without recombination.
 - B. Use the same heterozygous parent and score many offspring.
 - C. Recombination frequency is unrelated to the distance between loci.
 - D. More distant loci produce a larger fraction of recombinant gametes.

Passage 6: Respiratory physiology

In a follow-up study of oxygen binding, investigators compared two conditions that differed in blood oxygen partial pressure. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: At matched temperature and pH, hemoglobin saturation increased with oxygen partial pressure, with the steepest change in the middle of the binding curve. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that cooperative binding creates a curve with plateau and steep regions. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

137. Which new result would most clearly distinguish the proposed explanation of oxygen binding from a competing mechanism?
- A. Hemoglobin binds oxygen irreversibly under physiological conditions.
 - B. pH cannot alter hemoglobin's oxygen affinity.
 - C. The curve shifts when pH changes at constant oxygen pressure.
 - D. Hemoglobin saturation changes linearly with oxygen pressure at every range.
138. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. pH cannot alter hemoglobin's oxygen affinity.
 - B. At high partial pressure, a moderate increase produces a smaller saturation increase than it would in the steep region.
 - C. Hemoglobin saturation changes linearly with oxygen pressure at every range.
 - D. Hemoglobin binds oxygen irreversibly under physiological conditions.
139. Which protocol would best isolate the effect of blood oxygen partial pressure on oxygen binding?
- A. The curve shifts when pH changes at constant oxygen pressure.
 - B. Measure saturation with temperature and pH fixed.
 - C. Hemoglobin saturation changes linearly with oxygen pressure at every range.
 - D. Hemoglobin binds oxygen irreversibly under physiological conditions.
140. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Hemoglobin binds oxygen irreversibly under physiological conditions.
 - B. Hemoglobin saturation changes linearly with oxygen pressure at every range.

- C. Measure saturation with temperature and pH fixed.
- D. At high partial pressure, a moderate increase produces a smaller saturation increase than it would in the steep region.

Passage 7: Cardiovascular physiology

In a follow-up study of cardiac output, investigators compared two conditions that differed in heart rate at fixed stroke volume. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Direct flow measurements matched the product of heart rate and stroke volume during the transient interval studied. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that the product of rate and volume determines output. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

141. Which new result would most clearly distinguish the proposed explanation of cardiac output from a competing mechanism?
- A. Cardiac output equals blood pressure divided by oxygen concentration.
 - B. Heart rate and stroke volume cannot influence the same output.
 - C. Cardiac output is independent of volume ejected per beat.
 - D. Direct flow measurement matches the predicted product.
142. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Cardiac output increases when heart rate rises if stroke volume is unchanged.
 - B. Cardiac output equals blood pressure divided by oxygen concentration.
 - C. Heart rate and stroke volume cannot influence the same output.
 - D. Cardiac output is independent of volume ejected per beat.
143. Which protocol would best isolate the effect of heart rate at fixed stroke volume on cardiac output?
- A. Cardiac output equals blood pressure divided by oxygen concentration.
 - B. Heart rate and stroke volume cannot influence the same output.
 - C. Direct flow measurement matches the predicted product.
 - D. Measure output while keeping stroke volume and venous return constant.
144. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Heart rate and stroke volume cannot influence the same output.
 - B. Cardiac output equals blood pressure divided by oxygen concentration.
 - C. Measure output while keeping stroke volume and venous return constant.
 - D. Cardiac output increases when heart rate rises if stroke volume is unchanged.

Passage 8: Membrane transport

In a follow-up study of solute movement, investigators compared two conditions that differed in the concentration gradient. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: With voltage fixed, increasing the ion concentration ratio increased the initial current through the open channels. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that net passive flux depends on the gradient, while a finite transporter population can become occupied. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

145. Which new result would most clearly distinguish the proposed explanation of solute movement from a competing mechanism?
- A. Blocking the transporter reduces flux without changing the gradient.
 - B. Passive transport moves solute against its electrochemical gradient without energy input.
 - C. ATP is required for every form of membrane movement.
 - D. Membrane composition cannot affect solute flux.
146. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Net movement increases as the concentration gradient becomes larger, until another transport limit is reached.
 - B. Passive transport moves solute against its electrochemical gradient without energy input.
 - C. ATP is required for every form of membrane movement.
 - D. Membrane composition cannot affect solute flux.
147. Which protocol would best isolate the effect of the concentration gradient on solute movement?
- A. ATP is required for every form of membrane movement.
 - B. Blocking the transporter reduces flux without changing the gradient.
 - C. Use identical membranes and vary only the starting concentration difference.
 - D. Passive transport moves solute against its electrochemical gradient without energy input.
148. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. ATP is required for every form of membrane movement.
 - B. Net movement increases as the concentration gradient becomes larger, until another transport limit is reached.
 - C. Passive transport moves solute against its electrochemical gradient without energy input.
 - D. Use identical membranes and vary only the starting concentration difference.

Passage 9: Gene expression

In a follow-up study of transcription, investigators compared two conditions that differed in the availability of an activating transcription factor. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Target-gene RNA increased in cells receiving the activating factor before the encoded protein increased. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that regulatory proteins influence whether RNA polymerase initiates transcription efficiently. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

149. Which new result would most clearly distinguish the proposed explanation of transcription from a competing mechanism?
- A. Target-gene RNA rises before the encoded protein increases.
 - B. Translation occurs before transcription in a eukaryotic cell.
 - C. Every change in gene expression requires a change in DNA sequence.
 - D. Ribosomes bind regulatory DNA to initiate transcription.
150. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Every change in gene expression requires a change in DNA sequence.
 - B. Ribosomes bind regulatory DNA to initiate transcription.
 - C. Messenger RNA for the target gene increases when an activating factor is available.
 - D. Translation occurs before transcription in a eukaryotic cell.
151. Which protocol would best isolate the effect of the availability of an activating transcription factor on transcription?
- A. Translation occurs before transcription in a eukaryotic cell.
 - B. Every change in gene expression requires a change in DNA sequence.
 - C. Target-gene RNA rises before the encoded protein increases.
 - D. Compare cells with and without the factor while keeping promoter sequence identical.
152. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Messenger RNA for the target gene increases when an activating factor is available.
 - B. Compare cells with and without the factor while keeping promoter sequence identical.
 - C. Translation occurs before transcription in a eukaryotic cell.
 - D. Every change in gene expression requires a change in DNA sequence.

Passage 10: Enzyme kinetics

In a follow-up study of enzyme activity, investigators compared two conditions that differed in substrate concentration. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Velocity rose rapidly at low substrate concentration and approached a plateau at high concentration. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that finite active-site availability produces saturation behavior. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

153. Which new result would most clearly distinguish the proposed explanation of enzyme activity from a competing mechanism?
- A. Velocity continues to rise linearly without approaching a plateau.
 - B. A velocity-versus-substrate plot rises and approaches a plateau, while a double-reciprocal plot of $1/v$ against $1/[S]$ is linear.
 - C. Velocity decreases immediately as substrate rises for every enzyme.
 - D. Enzyme concentration alone determines velocity regardless of substrate concentration.
154. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Velocity rises at first and then approaches a plateau.
 - B. Velocity decreases immediately as substrate rises for every enzyme.
 - C. Enzyme concentration alone determines velocity regardless of substrate concentration.
 - D. Velocity continues to rise linearly without approaching a plateau.
155. Which protocol would best isolate the effect of substrate concentration on enzyme activity?
- A. Velocity decreases immediately as substrate rises for every enzyme.
 - B. Enzyme concentration alone determines velocity regardless of substrate concentration.
 - C. A velocity-versus-substrate plot rises and approaches a plateau, while a double-reciprocal plot of $1/v$ against $1/[S]$ is linear.
 - D. Measure the same enzyme with substrate varied and enzyme concentration fixed.
156. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Measure the same enzyme with substrate varied and enzyme concentration fixed.
 - B. Velocity decreases immediately as substrate rises for every enzyme.
 - C. Enzyme concentration alone determines velocity regardless of substrate concentration.
 - D. Velocity rises at first and then approaches a plateau.
157. In a simple model, a noncompetitive inhibitor most directly decreases:
- A. V_{max}
 - B. The amount of substrate
 - C. The genetic code

D. The number of chromosomes

158. Transcription in a eukaryotic cell occurs primarily in the:

A. Extracellular fluid

B. Nucleus

C. Ribosome

D. Lysosome

159. A ribosome uses which molecule as the immediate template for a polypeptide?

A. Antibody

B. mRNA

C. Lipid

D. Glycogen

160. A homozygous recessive individual for a trait represented by A/a has genotype:

A. AA

B. A

C. aa

D. Aa

161. Increased ADH most directly increases water reabsorption in the:

A. Renal artery wall only

B. Collecting duct

C. Glomerular basement membrane

D. Bowman capsule

162. A hormone that crosses the phospholipid bilayer and binds an intracellular receptor is most likely:

A. A membrane-impermeable ion

B. A ribosomal RNA

C. Lipid-soluble

D. A large polysaccharide

163. During repolarization of a typical neuron, which event contributes directly?

A. Permanent loss of all ion gradients

B. DNA replication

C. Ribosome dissociation

D. Potassium efflux

- 164.** A deletion of two nucleotides from a coding sequence is most likely to cause:
- A. A silent change by definition
 - B. Whole-genome duplication
 - C. No possible protein effect
 - D. A frameshift
- 165.** A receptor tyrosine kinase is activated most directly by:
- A. Dissolution of the phospholipid bilayer
 - B. Ligand binding that promotes receptor phosphorylation
 - C. mRNA degradation in the nucleus
 - D. Peptide-bond hydrolysis in a ribosome
- 166.** During meiosis I, the structures that separate are primarily:
- A. Amino acids
 - B. Ribosomal subunits
 - C. Homologous chromosomes
 - D. Sister chromatids
- 167.** Disulfide bonds most directly stabilize which level of protein organization?
- A. Tertiary structure
 - B. Primary sequence only
 - C. The genetic code
 - D. Chromosome number
- 168.** A cell in a hypotonic solution will generally:
- A. Lose water and shrink
 - B. Remain unaffected under all conditions
 - C. Immediately divide
 - D. Gain water and swell
- 169.** A study that measures naturally occurring variables without assigning treatment has limited ability to establish:
- A. A descriptive association
 - B. Causation
 - C. A sample mean
 - D. A measurement unit

170. The immune cells that secrete large amounts of antibody are:

- A.** Plasma cells
- B.** Platelets
- C.** Osteoclasts
- D.** Motor neurons

171. A founder effect can reduce variation because:

- A.** Every allele is copied equally into every new population
- B.** Mutation stops permanently
- C.** Natural selection becomes impossible
- D.** A small founding group carries only a subset of the source population's alleles

MCAT Psychological, Social, and Biological Foundations of Behavior

Section timing: 95 minutes

Passage 1: Group processes

In a follow-up study of norms, investigators compared two conditions that differed in the clarity of group expectations. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Behavior became more similar when expectations were clear and approval and disapproval were consistently communicated. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that norms operate through shared expectations and social consequences. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

172. Which new result would most clearly distinguish the proposed explanation of norms from a competing mechanism?
- A. Norms affect only isolated individuals.
 - B. Groups cannot enforce expectations through approval or sanctions.
 - C. Private disagreement automatically ends a group norm.
 - D. Members change behavior after learning the group's approval and disapproval patterns.
173. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Groups cannot enforce expectations through approval or sanctions.
 - B. Private disagreement automatically ends a group norm.
 - C. Behavior becomes more similar across members when norms are clear and consistently enforced.
 - D. Norms affect only isolated individuals.
174. Which protocol would best isolate the effect of the clarity of group expectations on norms?
- A. Members change behavior after learning the group's approval and disapproval patterns.
 - B. Compare groups with the same task but different clarity of expectations.
 - C. Norms affect only isolated individuals.
 - D. Groups cannot enforce expectations through approval or sanctions.
175. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Behavior becomes more similar across members when norms are clear and consistently enforced.
 - B. Compare groups with the same task but different clarity of expectations.
 - C. Norms affect only isolated individuals.
 - D. Groups cannot enforce expectations through approval or sanctions.
176. Which observation would be most inconsistent with the proposed explanation of norms?
- A. Behavior becomes more similar across members when norms are clear and consistently enforced.

- B. A norm can persist even when individual members privately disagree.
- C. Norms affect only isolated individuals.
- D. Members change behavior after learning the group's approval and disapproval patterns.

Passage 2: Attitudes and behavior

In a follow-up study of cognitive dissonance, investigators compared two conditions that differed in inconsistency between belief and action. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Attitude change was greatest when participants freely chose the difficult action and received little external justification. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that insufficient external justification can make internal attitude adjustment more likely. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

177. Which new result would most clearly distinguish the proposed explanation of cognitive dissonance from a competing mechanism?
- A. Inconsistency always strengthens the original attitude.
 - B. People never change attitudes after acting.
 - C. External rewards have identical psychological effects at every size.
 - D. Attitude change is greatest when external justification is modest.
178. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. People never change attitudes after acting.
 - B. External rewards have identical psychological effects at every size.
 - C. A person may report a more favorable attitude after freely choosing a difficult action.
 - D. Inconsistency always strengthens the original attitude.
179. Which protocol would best isolate the effect of inconsistency between belief and action on cognitive dissonance?
- A. Inconsistency always strengthens the original attitude.
 - B. People never change attitudes after acting.
 - C. Attitude change is greatest when external justification is modest.
 - D. Compare with a person who was strongly rewarded or forced to perform the same action.
180. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Inconsistency always strengthens the original attitude.
 - B. Compare with a person who was strongly rewarded or forced to perform the same action.
 - C. People never change attitudes after acting.
 - D. A person may report a more favorable attitude after freely choosing a difficult action.

181. Which observation would be most inconsistent with the proposed explanation of cognitive dissonance?
- A. A person may report a more favorable attitude after freely choosing a difficult action.
 - B. The size and meaning of the incentive affect whether attitude change is expected.
 - C. Inconsistency always strengthens the original attitude.
 - D. Attitude change is greatest when external justification is modest.

Passage 3: Development

In a follow-up study of cognitive change, investigators compared two conditions that differed in the child's ability to use abstract rules. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The child generalized the same reasoning operation across tasks with different surface content. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that developmental interpretations must distinguish the underlying reasoning ability from task familiarity. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

182. Which new result would most clearly distinguish the proposed explanation of cognitive change from a competing mechanism?
- A. The child succeeds across several tasks requiring the same reasoning operation.
 - B. Development stops after infancy.
 - C. Every child reaches developmental milestones at exactly the same age.
 - D. Task demands never affect observed performance.
183. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Task demands never affect observed performance.
 - B. A child who can reason systematically about hypothetical situations shows more advanced abstract thinking.
 - C. Development stops after infancy.
 - D. Every child reaches developmental milestones at exactly the same age.
184. Which protocol would best isolate the effect of the child's ability to use abstract rules on cognitive change?
- A. The child succeeds across several tasks requiring the same reasoning operation.
 - B. Use tasks matched for vocabulary and working-memory demands.
 - C. Development stops after infancy.
 - D. Every child reaches developmental milestones at exactly the same age.
185. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Every child reaches developmental milestones at exactly the same age.

- B. A child who can reason systematically about hypothetical situations shows more advanced abstract thinking.
- C. Development stops after infancy.
- D. Use tasks matched for vocabulary and working-memory demands.

186. Which observation would be most inconsistent with the proposed explanation of cognitive change?

- A. A child who can reason systematically about hypothetical situations shows more advanced abstract thinking.
- B. Performance reflects both cognitive stage and the demands of the task.
- C. Development stops after infancy.
- D. The child succeeds across several tasks requiring the same reasoning operation.

Passage 4: Research methods

In a follow-up study of causal inference, investigators compared two conditions that differed in the proportion of participants assigned by lottery. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Baseline characteristics were more similar across treatment groups before the intervention. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that chance assignment reduces systematic baseline differences between conditions. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

187. Which new result would most clearly distinguish the proposed explanation of causal inference from a competing mechanism?

- A. Random assignment makes a comparison group unnecessary.
- B. Baseline characteristics are more similar across lottery-assigned treatment groups before treatment.
- C. Random assignment guarantees that a sample represents the target population.
- D. Random assignment removes every source of measurement error.

188. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?

- A. Random assignment removes every source of measurement error.
- B. Random assignment makes a comparison group unnecessary.
- C. As the lottery-assigned share increases, treatment groups become more comparable at baseline on average.
- D. Random assignment guarantees that a sample represents the target population.

189. Which protocol would best isolate the effect of the proportion of participants assigned by lottery on causal inference?

- A. Compare lottery-assigned and investigator-assigned groups while keeping recruitment, treatment, and measurement procedures constant.
- B. Random assignment guarantees that a sample represents the target population.

- C. Random assignment removes every source of measurement error.
- D. Baseline characteristics are more similar across lottery-assigned treatment groups before treatment.

190. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?

- A. Random assignment removes every source of measurement error.
- B. As the lottery-assigned share increases, treatment groups become more comparable at baseline on average.
- C. Compare lottery-assigned and investigator-assigned groups while keeping recruitment, treatment, and measurement procedures constant.
- D. Random assignment guarantees that a sample represents the target population.

191. Which observation would be most inconsistent with the proposed explanation of causal inference?

- A. Random assignment guarantees that a sample represents the target population.
- B. Baseline characteristics are more similar across lottery-assigned treatment groups before treatment.
- C. As the lottery-assigned share increases, treatment groups become more comparable at baseline on average.
- D. Random assignment supports causal inference but does not guarantee a representative sample.

Passage 5: Social stratification

In a follow-up study of resource access, investigators compared two conditions that differed in access to health-supporting resources. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Outcome differences narrowed after transportation and clinic-access barriers were reduced. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that social position shapes exposure, opportunity, and ability to use resources. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

192. Which new result would most clearly distinguish the proposed explanation of resource access from a competing mechanism?

- A. Structural conditions cannot affect individual behavior or health.
- B. Outcome differences shrink after access barriers are reduced.
- C. Health differences among groups are always random.
- D. Access to resources has no relation to health outcomes.

193. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?

- A. Reducing access barriers can improve outcomes without changing individual motivation.
- B. Health differences among groups are always random.
- C. Access to resources has no relation to health outcomes.
- D. Structural conditions cannot affect individual behavior or health.

194. Which protocol would best isolate the effect of access to health-supporting resources on resource access?
- A. Access to resources has no relation to health outcomes.
 - B. Outcome differences shrink after access barriers are reduced.
 - C. Compare otherwise similar neighborhoods with different transportation or clinic access.
 - D. Health differences among groups are always random.
195. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Health differences among groups are always random.
 - B. Access to resources has no relation to health outcomes.
 - C. Reducing access barriers can improve outcomes without changing individual motivation.
 - D. Compare otherwise similar neighborhoods with different transportation or clinic access.

Passage 6: Social identity

In a follow-up study of group membership, investigators compared two conditions that differed in the salience of a group category. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The same feedback produced a larger response when the relevant group category was made salient. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that identity links individual self-understanding to social groups and expectations. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

196. Which new result would most clearly distinguish the proposed explanation of group membership from a competing mechanism?
- A. Stereotypes can affect only physical traits and not performance or judgment.
 - B. The same feedback produces different effects after category cues change.
 - C. Identity is unrelated to social context.
 - D. Groups never influence self-concept.
197. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Stereotypes can affect only physical traits and not performance or judgment.
 - B. Identity-relevant feedback has a larger effect when the category is salient.
 - C. Identity is unrelated to social context.
 - D. Groups never influence self-concept.
198. Which protocol would best isolate the effect of the salience of a group category on group membership?
- A. Groups never influence self-concept.
 - B. The same feedback produces different effects after category cues change.
 - C. Compare feedback with the same content but different category cues.
 - D. Identity is unrelated to social context.

199. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Identity is unrelated to social context.
 - B. Compare feedback with the same content but different category cues.
 - C. Groups never influence self-concept.
 - D. Identity-relevant feedback has a larger effect when the category is salient.

Passage 7: Stress physiology

In a follow-up study of stress response, investigators compared two conditions that differed in perceived threat. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Heart rate and stress-hormone concentration rose during the acute threat but returned toward baseline after the task ended. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that the stress response prepares the organism for action but has costs when prolonged. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

200. Which new result would most clearly distinguish the proposed explanation of stress response from a competing mechanism?
- A. Physiological measures rise even when movement is matched.
 - B. Stress responses require no physiological change.
 - C. The sympathetic system only reduces arousal.
 - D. All stress is beneficial regardless of duration or intensity.
201. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Heart rate and circulating stress hormones rise during an acute threat.
 - B. Stress responses require no physiological change.
 - C. The sympathetic system only reduces arousal.
 - D. All stress is beneficial regardless of duration or intensity.
202. Which protocol would best isolate the effect of perceived threat on stress response?
- A. Compare with a neutral task matched for movement and duration.
 - B. Stress responses require no physiological change.
 - C. The sympathetic system only reduces arousal.
 - D. Physiological measures rise even when movement is matched.
203. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Heart rate and circulating stress hormones rise during an acute threat.
 - B. Stress responses require no physiological change.
 - C. Compare with a neutral task matched for movement and duration.

- D. The sympathetic system only reduces arousal.

Passage 8: Memory

In a follow-up study of encoding, investigators compared two conditions that differed in meaningful organization of information. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Participants who organized the list recalled more items than participants given the same study time without organization instructions. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that elaboration and organization create more routes for later retrieval. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

- 204.** Which new result would most clearly distinguish the proposed explanation of encoding from a competing mechanism?
- A. Retrieval is unrelated to the way information was encoded.
 - B. Performance improves when the test provides matching organizational cues.
 - C. Memory is a perfect recording of every experience.
 - D. Organizing information always prevents later recall.
- 205.** The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Memory is a perfect recording of every experience.
 - B. Organizing information always prevents later recall.
 - C. Retrieval is unrelated to the way information was encoded.
 - D. Participants who group related items recall more than participants who study the same items randomly.
- 206.** Which protocol would best isolate the effect of meaningful organization of information on encoding?
- A. Performance improves when the test provides matching organizational cues.
 - B. Keep study time and list length constant while changing organization instructions.
 - C. Memory is a perfect recording of every experience.
 - D. Organizing information always prevents later recall.
- 207.** Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Participants who group related items recall more than participants who study the same items randomly.
 - B. Keep study time and list length constant while changing organization instructions.
 - C. Memory is a perfect recording of every experience.
 - D. Organizing information always prevents later recall.

Passage 9: Learning

In a follow-up study of reinforcement, investigators compared two conditions that differed in the consequence following a behavior. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: The target response became more frequent only when the reinforcing consequence followed that response. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that operant learning changes behavior according to its consequences. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

208. Which new result would most clearly distinguish the proposed explanation of reinforcement from a competing mechanism?
- A. Reinforcement always decreases the behavior it follows.
 - B. Consequences cannot affect the probability of a future behavior.
 - C. Classical and operant conditioning use identical learning procedures.
 - D. Behavior changes only when the consequence follows the target response.
209. The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. The behavior increases when the reinforcing consequence is reliably delivered.
 - B. Reinforcement always decreases the behavior it follows.
 - C. Consequences cannot affect the probability of a future behavior.
 - D. Classical and operant conditioning use identical learning procedures.
210. Which protocol would best isolate the effect of the consequence following a behavior on reinforcement?
- A. Reinforcement always decreases the behavior it follows.
 - B. Consequences cannot affect the probability of a future behavior.
 - C. Behavior changes only when the consequence follows the target response.
 - D. Compare with a group receiving the same exposure but no contingent consequence.
211. Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. Reinforcement always decreases the behavior it follows.
 - B. Compare with a group receiving the same exposure but no contingent consequence.
 - C. The behavior increases when the reinforcing consequence is reliably delivered.
 - D. Consequences cannot affect the probability of a future behavior.

Passage 10: Sensation and perception

In a follow-up study of sensory processing, investigators compared two conditions that differed in stimulus intensity. They preregistered the expected direction and repeated the measurement with an independent batch of samples. The follow-up was designed to separate the proposed mechanism from a tempting alternative explanation. Data summary: Detection improved as intensity increased, even though the instructions and environment were unchanged. The researchers also monitored the comparison variable described in the protocol. The result supports the interpretation that sensation begins with detection, while perception includes interpretation shaped by context. A replication supports the mechanism only within the tested range and does not remove the need to identify possible confounders.

- 212.** Which new result would most clearly distinguish the proposed explanation of sensory processing from a competing mechanism?
- A. Every stimulus is detected with certainty once it is present.
 - B. Expectations cannot influence interpretation of ambiguous input.
 - C. Detection improves as intensity rises while instructions remain constant.
 - D. Perception is independent of neural processing.
- 213.** The investigators repeat the study after the focal variable changes in the direction described by the passage. Which immediate outcome should be measured first?
- A. Expectations cannot influence interpretation of ambiguous input.
 - B. A stimulus near threshold is detected less consistently than a clearly stronger stimulus.
 - C. Perception is independent of neural processing.
 - D. Every stimulus is detected with certainty once it is present.
- 214.** Which protocol would best isolate the effect of stimulus intensity on sensory processing?
- A. Detection improves as intensity rises while instructions remain constant.
 - B. Use the same participant and environment while varying only intensity.
 - C. Perception is independent of neural processing.
 - D. Every stimulus is detected with certainty once it is present.
- 215.** Which prediction follows when the focal variable moves in the same direction described in the passage and the mechanism operates within the tested range?
- A. A stimulus near threshold is detected less consistently than a clearly stronger stimulus.
 - B. Every stimulus is detected with certainty once it is present.
 - C. Perception is independent of neural processing.
 - D. Use the same participant and environment while varying only intensity.
- 216.** The minimum intensity of a stimulus that can be detected reliably is the:
- A. Role conflict
 - B. Absolute threshold
 - C. Difference threshold
 - D. Group norm

- 217.** A behavior becomes more frequent because a consequence is presented after it. This is:
- A. Positive reinforcement
 - B. Negative punishment
 - C. Classical extinction
 - D. Social stratification
- 218.** Remembering a phone number by grouping digits is an example of:
- A. Groupthink
 - B. Habituation only
 - C. Chunking
 - D. Projection
- 219.** The hypothalamic-pituitary-adrenal axis is most directly associated with:
- A. Visual accommodation only
 - B. Language syntax only
 - C. Social stratification only
 - D. The endocrine stress response
- 220.** Favoring one's own group over an outside group is called:
- A. Operant extinction
 - B. Signal detection
 - C. In-group bias
 - D. The fundamental attribution error
- 221.** A sociologist studying unequal access to income, housing, and education is examining:
- A. Absolute threshold
 - B. Social stratification
 - C. Classical conditioning
 - D. Working memory
- 222.** Random assignment primarily improves a study's:
- A. Internal validity for causal comparison
 - B. Representativeness of the sample
 - C. Measurement reliability automatically
 - D. Population size
- 223.** Reasoning about hypothetical situations is most characteristic of Piaget's:

- A. Sensorimotor stage only
- B. Preoperational egocentrism only
- C. Attachment classification
- D. Formal operational stage

224. Taking credit for success but blaming circumstances for failure illustrates:

- A. Classical conditioning
- B. Social facilitation
- C. Self-serving bias
- D. Group polarization

225. A group suppresses dissent to preserve apparent unanimity. This is:

- A. Groupthink
- B. Social loafing
- C. Signal detection
- D. Negative reinforcement

226. A measure can be reliable without being valid when it:

- A. Uses a random sample
- B. Contains no observable variables
- C. Produces consistent scores but misses the intended construct
- D. Measures the intended construct perfectly every time

227. A person changes a belief after freely performing an action that conflicts with it. This may reflect:

- A. Cognitive dissonance
- B. The absolute threshold
- C. Social loafing
- D. Sensory adaptation

228. A sample drawn from volunteers at one clinic is most likely limited in:

- A. The existence of a dependent variable
- B. The possibility of measurement
- C. Generalizability
- D. Random assignment by definition

229. A person who learns a behavior by watching a model demonstrates:

- A. Classical extinction only

- B. Social stratification
- C. A placebo effect by definition
- D. Observational learning

230. A social determinant of health is best illustrated by:

- A. Transportation access affecting whether people can reach preventive care
- B. A chromosome changing codon sequence
- C. A reflex arc alone
- D. A lens changing focal length

Answer Key and Explanations

1. **Answer: C.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: each half-life removes half of the nuclei present at its beginning.
2. **Answer: D.** The immediate outcome should match the stated prediction and mechanism: each half-life removes half of the nuclei present at its beginning.
3. **Answer: B.** A valid protocol holds the relevant competing variables steady while measuring radioactive decay.
4. **Answer: C.** The prediction is limited to the tested range and follows because each half-life removes half of the nuclei present at its beginning.
5. **Answer: D.** The observation is inconsistent because it conflicts with the mechanism used to explain radioactive decay: each half-life removes half of the nuclei present at its beginning.
6. **Answer: A.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: an ion responds to the combined electrochemical gradient.
7. **Answer: A.** The immediate outcome should match the stated prediction and mechanism: an ion responds to the combined electrochemical gradient.
8. **Answer: A.** A valid protocol holds the relevant competing variables steady while measuring electrochemical gradients.
9. **Answer: D.** The prediction is limited to the tested range and follows because an ion responds to the combined electrochemical gradient.
10. **Answer: C.** The observation is inconsistent because it conflicts with the mechanism used to explain electrochemical gradients: an ion responds to the combined electrochemical gradient.
11. **Answer: C.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: Gibbs free energy combines enthalpy with the temperature-weighted entropy change.
12. **Answer: A.** The immediate outcome should match the stated prediction and mechanism: Gibbs free energy combines enthalpy with the temperature-weighted entropy change.
13. **Answer: D.** A valid protocol holds the relevant competing variables steady while measuring free-energy change.
14. **Answer: C.** The prediction is limited to the tested range and follows because Gibbs free energy combines enthalpy with the temperature-weighted entropy change.
15. **Answer: D.** The observation is inconsistent because it conflicts with the mechanism used to explain free-energy change: Gibbs free energy combines enthalpy with the temperature-weighted entropy change.

16. **Answer: D.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: electron withdrawal leaves the carbonyl carbon more electron-poor.
17. **Answer: A.** The immediate outcome should match the stated prediction and mechanism: electron withdrawal leaves the carbonyl carbon more electron-poor.
18. **Answer: B.** A valid protocol holds the relevant competing variables steady while measuring carbonyl reactivity.
19. **Answer: A.** The prediction is limited to the tested range and follows because electron withdrawal leaves the carbonyl carbon more electron-poor.
20. **Answer: D.** The observation is inconsistent because it conflicts with the mechanism used to explain carbonyl reactivity: electron withdrawal leaves the carbonyl carbon more electron-poor.
21. **Answer: A.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: focal length is determined by optical power, which depends on curvature and refractive index.
22. **Answer: A.** The immediate outcome should match the stated prediction and mechanism: focal length is determined by optical power, which depends on curvature and refractive index.
23. **Answer: A.** A valid protocol holds the relevant competing variables steady while measuring lens formation.
24. **Answer: A.** The prediction is limited to the tested range and follows because focal length is determined by optical power, which depends on curvature and refractive index.
25. **Answer: B.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: the Nernst relationship includes the logarithm of the reaction quotient.
26. **Answer: B.** The immediate outcome should match the stated prediction and mechanism: the Nernst relationship includes the logarithm of the reaction quotient.
27. **Answer: A.** A valid protocol holds the relevant competing variables steady while measuring cell potential.
28. **Answer: B.** The prediction is limited to the tested range and follows because the Nernst relationship includes the logarithm of the reaction quotient.
29. **Answer: D.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: the radius appears with a high power in the flow relationship.
30. **Answer: A.** The immediate outcome should match the stated prediction and mechanism: the radius appears with a high power in the flow relationship.
31. **Answer: B.** A valid protocol holds the relevant competing variables steady while measuring vascular flow.

- 32. Answer: A.** The prediction is limited to the tested range and follows because the radius appears with a high power in the flow relationship.
- 33. Answer: D.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: the catalyst changes the pathway and rate but not the energy difference between reactants and products.
- 34. Answer: D.** The immediate outcome should match the stated prediction and mechanism: the catalyst changes the pathway and rate but not the energy difference between reactants and products.
- 35. Answer: A.** A valid protocol holds the relevant competing variables steady while measuring activation energy.
- 36. Answer: A.** The prediction is limited to the tested range and follows because the catalyst changes the pathway and rate but not the energy difference between reactants and products.
- 37. Answer: A.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: the conjugate base reacts with added hydrogen ion before free hydrogen ion accumulates.
- 38. Answer: C.** The immediate outcome should match the stated prediction and mechanism: the conjugate base reacts with added hydrogen ion before free hydrogen ion accumulates.
- 39. Answer: B.** A valid protocol holds the relevant competing variables steady while measuring acid-base buffering.
- 40. Answer: C.** The prediction is limited to the tested range and follows because the conjugate base reacts with added hydrogen ion before free hydrogen ion accumulates.
- 41. Answer: B.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: a larger gradient provides a larger driving force for net diffusion.
- 42. Answer: D.** The immediate outcome should match the stated prediction and mechanism: a larger gradient provides a larger driving force for net diffusion.
- 43. Answer: A.** A valid protocol holds the relevant competing variables steady while measuring alveolar diffusion.
- 44. Answer: B.** The prediction is limited to the tested range and follows because a larger gradient provides a larger driving force for net diffusion.
- 45. Answer: D.** Molarity is moles divided by liters: $0.75/3.0 = 0.25 \text{ M}$.
- 46. Answer: A.** pH equals negative log of hydrogen-ion concentration, so pH 5 corresponds to 0.00001 M .
- 47. Answer: D.** Kinetic energy is one-half mv squared: $0.5 \times 4.0 \times 2.0 \text{ squared} = 8 \text{ J}$.
- 48. Answer: C.** Ohm's law gives $I = V/R = 6.0/2.0 = 3.0 \text{ A}$.

- 49. Answer: C.** A catalyst lowers the activation barrier for both directions and does not change the equilibrium constant.
- 50. Answer: B.** Peptide-bond hydrolysis reverses condensation between an amino group and a carboxyl group.
- 51. Answer: D.** At constant temperature and amount, pressure is inversely proportional to volume.
- 52. Answer: A.** For a parallel force, work equals force times displacement: $30 \times 0.50 = 15 \text{ J}$.
- 53. Answer: B.** The oxidizing agent accepts electrons and is therefore reduced.
- 54. Answer: A.** The Henderson-Hasselbalch relationship gives $\text{pH} = \text{pKa}$ when the acid and conjugate-base concentrations are equal.
- 55. Answer: C.** Acceleration is the time derivative of velocity.
- 56. Answer: B.** Overall molecular polarity depends on the vector sum of bond dipoles, not on one bond alone.
- 57. Answer: C.** Both terms make Gibbs free energy positive: positive enthalpy and subtracting a negative entropy term.
- 58. Answer: B.** The Henderson-Hasselbalch relationship gives equal concentrations when pH equals pKa .
- 59. Answer: A.** Water moves toward the side with greater effective concentration of nonpenetrating solute.
- 60. Answer: D.** The author's central claim is that a record's silence reflects selection as well as missing events.
- 61. Answer: D.** The examples make the passage's distinction concrete: the archive example connects surviving traces to access, durability, and later search.
- 62. Answer: B.** The evidence and qualifications support the inference that absence becomes informative when linked to the mechanisms that produced the record.
- 63. Answer: A.** The argument would require revision if evidence showed that the archive is demonstrably complete for this category and contains every event of this kind.
- 64. Answer: C.** The passage directs the decision-maker to supplement the archive by examining how preservation shaped what can now be known.
- 65. Answer: C.** The proposal transfers the passage's method without dropping its limits: It treats the silence as evidence about preservation and access rather than as proof of nonexistence.
- 66. Answer: D.** The author's central claim is that the value of convenience includes burdens shifted away from the immediate user.

- 67. Answer: B.** The examples make the passage's distinction concrete: delivery and disposable-product examples reveal displaced labor and environmental cost.
- 68. Answer: A.** The evidence and qualifications support the inference that a service can save time without producing an unqualified social benefit.
- 69. Answer: A.** The argument would require revision if evidence showed that a consumer's saved time measures the service's total benefit.
- 70. Answer: A.** The passage directs the decision-maker to count who performs the hidden work and when the cost appears.
- 71. Answer: A.** The proposal transfers the passage's method without dropping its limits: It counts benefits and displaced costs beyond the immediate user's experience.
- 72. Answer: B.** The author's central claim is that subjective judgment can still be supported by public reasons.
- 73. Answer: C.** The examples make the passage's distinction concrete: the critic's comparison shows that expertise improves explanation without requiring agreement.
- 74. Answer: D.** The evidence and qualifications support the inference that disagreement is compatible with better and worse accounts of a work's aims.
- 75. Answer: D.** The argument would require revision if evidence showed that a reasoned judgment must become objective proof.
- 76. Answer: B.** The passage directs the decision-maker to evaluate the quality and answerability of the distinctions offered.
- 77. Answer: C.** The proposal transfers the passage's method without dropping its limits: It treats a judgment as subjective yet answerable to public reasons rather than as either proof or mere preference.
- 78. Answer: C.** The author's central claim is that environmental benefits depend on who can remain and participate.
- 79. Answer: D.** The examples make the passage's distinction concrete: the tree-planting example connects shade and walking to rent pressure and displacement.
- 80. Answer: C.** The evidence and qualifications support the inference that a park's success cannot be measured only by its physical improvement.
- 81. Answer: A.** The argument would require revision if evidence showed that any rent increase makes planting environmentally harmful.
- 82. Answer: A.** The passage directs the decision-maker to compare the design that creates benefits with the distribution of access to them.

- 83. Answer: D.** The proposal transfers the passage's method without dropping its limits: It measures environmental success together with the distribution of access and displacement risk.
- 84. Answer: C.** The author's central claim is that summary statistics organize attention but do not replace distributions.
- 85. Answer: D.** The examples make the passage's distinction concrete: the commute example shows why an average can hide a long or unstable burden.
- 86. Answer: C.** The evidence and qualifications support the inference that an unusual case can reveal the mechanism behind a group pattern.
- 87. Answer: A.** The argument would require revision if evidence showed that an average is useless whenever individual experiences differ.
- 88. Answer: B.** The passage directs the decision-maker to pair the aggregate pattern with variation that tests where the summary fails.
- 89. Answer: D.** The proposal transfers the passage's method without dropping its limits: It uses the summary to locate a pattern and variation to test where that summary hides a mechanism.
- 90. Answer: D.** The author's central claim is that waiting can be an active practice of improving evidence.
- 91. Answer: C.** The examples make the passage's distinction concrete: the researcher's open question shows how measurement and alternative tests differ from passivity.
- 92. Answer: A.** The evidence and qualifications support the inference that uncertainty can support provisional action when the revision trigger is specified.
- 93. Answer: D.** The argument would require revision if evidence showed that uncertainty is a reason to avoid every decision.
- 94. Answer: D.** The passage directs the decision-maker to balance the need to act with evidence that would justify changing course.
- 95. Answer: B.** The proposal transfers the passage's method without dropping its limits: It treats waiting as active evidence improvement rather than as passive avoidance of a decision.
- 96. Answer: D.** The author's central claim is that specific uncertainty can strengthen rather than weaken expertise.
- 97. Answer: D.** The examples make the passage's distinction concrete: the forecast example shows how assumptions and warning signs make confidence inspectable.
- 98. Answer: B.** The evidence and qualifications support the inference that a confident tone without a revision condition gives less guidance than a qualified range.

99. **Answer: B.** The argument would require revision if evidence showed that a forecast is evasive whenever it states a range.
100. **Answer: A.** The passage directs the decision-maker to ask what assumptions and observations would count against the prediction.
101. **Answer: B.** The proposal transfers the passage's method without dropping its limits: It makes confidence inspectable by connecting the prediction to assumptions and revision conditions.
102. **Answer: C.** The author's central claim is that maintenance decisions depend on function and risk rather than nostalgia or impatience.
103. **Answer: C.** The examples make the passage's distinction concrete: the broken-object example weighs restored use against safety and efficiency.
104. **Answer: C.** The evidence and qualifications support the inference that replacement can waste material while repair can still be irresponsible when it cannot restore function.
105. **Answer: B.** The argument would require revision if evidence showed that repair is always more attentive than replacement.
106. **Answer: C.** The passage directs the decision-maker to compare the options against the object's needed use and the risks each creates.
107. **Answer: C.** The proposal transfers the passage's method without dropping its limits: It compares repair and replacement by use, material, and risk rather than treating either option as automatically virtuous.
108. **Answer: A.** The author's central claim is that shared language can coordinate action without making uniform speech a membership test.
109. **Answer: A.** The examples make the passage's distinction concrete: the correction example distinguishes clarifying meaning from ranking speakers.
110. **Answer: D.** The evidence and qualifications support the inference that a flexible standard can preserve intelligibility while participation builds belonging.
111. **Answer: B.** The argument would require revision if evidence showed that a common language requires one accepted accent and vocabulary.
112. **Answer: B.** The passage directs the decision-maker to separate the communicative purpose of a standard from its use as social gatekeeping.
113. **Answer: D.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: differential reproductive success shifts the distribution of heritable variants.

114. **Answer: B.** The immediate outcome should match the stated prediction and mechanism: differential reproductive success shifts the distribution of heritable variants.
115. **Answer: A.** A valid protocol holds the relevant competing variables steady while measuring selection.
116. **Answer: D.** The prediction is limited to the tested range and follows because differential reproductive success shifts the distribution of heritable variants.
117. **Answer: D.** The observation is inconsistent because it conflicts with the mechanism used to explain selection: differential reproductive success shifts the distribution of heritable variants.
118. **Answer: C.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: checkpoints protect genome integrity by delaying division or triggering repair or death.
119. **Answer: B.** The immediate outcome should match the stated prediction and mechanism: checkpoints protect genome integrity by delaying division or triggering repair or death.
120. **Answer: C.** A valid protocol holds the relevant competing variables steady while measuring checkpoint control.
121. **Answer: A.** The prediction is limited to the tested range and follows because checkpoints protect genome integrity by delaying division or triggering repair or death.
122. **Answer: A.** The observation is inconsistent because it conflicts with the mechanism used to explain checkpoint control: checkpoints protect genome integrity by delaying division or triggering repair or death.
123. **Answer: C.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: selection and proliferation amplify cells with matching receptors.
124. **Answer: B.** The immediate outcome should match the stated prediction and mechanism: selection and proliferation amplify cells with matching receptors.
125. **Answer: C.** A valid protocol holds the relevant competing variables steady while measuring clonal selection.
126. **Answer: B.** The prediction is limited to the tested range and follows because selection and proliferation amplify cells with matching receptors.
127. **Answer: B.** The observation is inconsistent because it conflicts with the mechanism used to explain clonal selection: selection and proliferation amplify cells with matching receptors.
128. **Answer: A.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: the gradient stores electrochemical energy used by ATP synthase.
129. **Answer: D.** The immediate outcome should match the stated prediction and mechanism: the gradient stores electrochemical energy used by ATP synthase.

- 130. Answer: C.** A valid protocol holds the relevant competing variables steady while measuring oxidative phosphorylation.
- 131. Answer: B.** The prediction is limited to the tested range and follows because the gradient stores electrochemical energy used by ATP synthase.
- 132. Answer: B.** The observation is inconsistent because it conflicts with the mechanism used to explain oxidative phosphorylation: the gradient stores electrochemical energy used by ATP synthase.
- 133. Answer: C.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: crossing over is more likely between loci that are farther apart.
- 134. Answer: B.** The immediate outcome should match the stated prediction and mechanism: crossing over is more likely between loci that are farther apart.
- 135. Answer: A.** A valid protocol holds the relevant competing variables steady while measuring linkage.
- 136. Answer: D.** The prediction is limited to the tested range and follows because crossing over is more likely between loci that are farther apart.
- 137. Answer: C.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: cooperative binding creates a curve with plateau and steep regions.
- 138. Answer: B.** The immediate outcome should match the stated prediction and mechanism: cooperative binding creates a curve with plateau and steep regions.
- 139. Answer: B.** A valid protocol holds the relevant competing variables steady while measuring oxygen binding.
- 140. Answer: D.** The prediction is limited to the tested range and follows because cooperative binding creates a curve with plateau and steep regions.
- 141. Answer: D.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: the product of rate and volume determines output.
- 142. Answer: A.** The immediate outcome should match the stated prediction and mechanism: the product of rate and volume determines output.
- 143. Answer: D.** A valid protocol holds the relevant competing variables steady while measuring cardiac output.
- 144. Answer: D.** The prediction is limited to the tested range and follows because the product of rate and volume determines output.
- 145. Answer: A.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: net passive flux depends on the gradient, while a finite transporter population can become occupied.

- 146. Answer: A.** The immediate outcome should match the stated prediction and mechanism: net passive flux depends on the gradient, while a finite transporter population can become occupied.
- 147. Answer: C.** A valid protocol holds the relevant competing variables steady while measuring solute movement.
- 148. Answer: B.** The prediction is limited to the tested range and follows because net passive flux depends on the gradient, while a finite transporter population can become occupied.
- 149. Answer: A.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: regulatory proteins influence whether RNA polymerase initiates transcription efficiently.
- 150. Answer: C.** The immediate outcome should match the stated prediction and mechanism: regulatory proteins influence whether RNA polymerase initiates transcription efficiently.
- 151. Answer: D.** A valid protocol holds the relevant competing variables steady while measuring transcription.
- 152. Answer: A.** The prediction is limited to the tested range and follows because regulatory proteins influence whether RNA polymerase initiates transcription efficiently.
- 153. Answer: B.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: finite active-site availability produces saturation behavior.
- 154. Answer: A.** The immediate outcome should match the stated prediction and mechanism: finite active-site availability produces saturation behavior.
- 155. Answer: D.** A valid protocol holds the relevant competing variables steady while measuring enzyme activity.
- 156. Answer: D.** The prediction is limited to the tested range and follows because finite active-site availability produces saturation behavior.
- 157. Answer: A.** Noncompetitive inhibition reduces the amount of functional enzyme, lowering V_{max} in the simple model.
- 158. Answer: B.** Nuclear DNA is transcribed into RNA before the RNA is exported for translation.
- 159. Answer: B.** The ribosome reads mRNA codons during translation.
- 160. Answer: C.** Homozygous recessive means two copies of the recessive allele.
- 161. Answer: B.** ADH increases collecting-duct water permeability, promoting water reabsorption.
- 162. Answer: C.** Lipid-soluble hormones can diffuse through the bilayer and bind intracellular receptors.

- 163. Answer: D.** Opening of potassium channels permits K^+ efflux and moves the membrane potential back toward negative values.
- 164. Answer: D.** A deletion not divisible by three shifts the reading frame downstream.
- 165. Answer: B.** Ligand binding can promote receptor dimerization and autophosphorylation, initiating signaling.
- 166. Answer: C.** Homologous chromosomes separate in meiosis I; sister chromatids separate in meiosis II.
- 167. Answer: A.** Covalent disulfide bonds between cysteine side chains can stabilize tertiary structure.
- 168. Answer: D.** Water enters toward the cell's greater effective solute concentration.
- 169. Answer: B.** Without experimental assignment, alternative explanations remain and causal inference is limited.
- 170. Answer: A.** Activated B cells can differentiate into antibody-secreting plasma cells.
- 171. Answer: D.** A small founding group can carry an unrepresentative sample of the source population's genetic variation.
- 172. Answer: D.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: norms operate through shared expectations and social consequences.
- 173. Answer: C.** The immediate outcome should match the stated prediction and mechanism: norms operate through shared expectations and social consequences.
- 174. Answer: B.** A valid protocol holds the relevant competing variables steady while measuring norms.
- 175. Answer: A.** The prediction is limited to the tested range and follows because norms operate through shared expectations and social consequences.
- 176. Answer: C.** The observation is inconsistent because it conflicts with the mechanism used to explain norms: norms operate through shared expectations and social consequences.
- 177. Answer: D.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: insufficient external justification can make internal attitude adjustment more likely.
- 178. Answer: C.** The immediate outcome should match the stated prediction and mechanism: insufficient external justification can make internal attitude adjustment more likely.
- 179. Answer: D.** A valid protocol holds the relevant competing variables steady while measuring cognitive dissonance.
- 180. Answer: D.** The prediction is limited to the tested range and follows because insufficient external justification can make internal attitude adjustment more likely.

- 181. Answer: C.** The observation is inconsistent because it conflicts with the mechanism used to explain cognitive dissonance: insufficient external justification can make internal attitude adjustment more likely.
- 182. Answer: A.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: developmental interpretations must distinguish the underlying reasoning ability from task familiarity.
- 183. Answer: B.** The immediate outcome should match the stated prediction and mechanism: developmental interpretations must distinguish the underlying reasoning ability from task familiarity.
- 184. Answer: B.** A valid protocol holds the relevant competing variables steady while measuring cognitive change.
- 185. Answer: B.** The prediction is limited to the tested range and follows because developmental interpretations must distinguish the underlying reasoning ability from task familiarity.
- 186. Answer: C.** The observation is inconsistent because it conflicts with the mechanism used to explain cognitive change: developmental interpretations must distinguish the underlying reasoning ability from task familiarity.
- 187. Answer: B.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: chance assignment reduces systematic baseline differences between conditions.
- 188. Answer: C.** The immediate outcome should match the stated prediction and mechanism: chance assignment reduces systematic baseline differences between conditions.
- 189. Answer: A.** A valid protocol holds the relevant competing variables steady while measuring causal inference.
- 190. Answer: B.** The prediction is limited to the tested range and follows because chance assignment reduces systematic baseline differences between conditions.
- 191. Answer: A.** The observation is inconsistent because it conflicts with the mechanism used to explain causal inference: chance assignment reduces systematic baseline differences between conditions.
- 192. Answer: B.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: social position shapes exposure, opportunity, and ability to use resources.
- 193. Answer: A.** The immediate outcome should match the stated prediction and mechanism: social position shapes exposure, opportunity, and ability to use resources.
- 194. Answer: C.** A valid protocol holds the relevant competing variables steady while measuring resource access.
- 195. Answer: C.** The prediction is limited to the tested range and follows because social position shapes exposure, opportunity, and ability to use resources.

- 196. Answer: B.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: identity links individual self-understanding to social groups and expectations.
- 197. Answer: B.** The immediate outcome should match the stated prediction and mechanism: identity links individual self-understanding to social groups and expectations.
- 198. Answer: C.** A valid protocol holds the relevant competing variables steady while measuring group membership.
- 199. Answer: D.** The prediction is limited to the tested range and follows because identity links individual self-understanding to social groups and expectations.
- 200. Answer: A.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: the stress response prepares the organism for action but has costs when prolonged.
- 201. Answer: A.** The immediate outcome should match the stated prediction and mechanism: the stress response prepares the organism for action but has costs when prolonged.
- 202. Answer: A.** A valid protocol holds the relevant competing variables steady while measuring stress response.
- 203. Answer: A.** The prediction is limited to the tested range and follows because the stress response prepares the organism for action but has costs when prolonged.
- 204. Answer: B.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: elaboration and organization create more routes for later retrieval.
- 205. Answer: D.** The immediate outcome should match the stated prediction and mechanism: elaboration and organization create more routes for later retrieval.
- 206. Answer: B.** A valid protocol holds the relevant competing variables steady while measuring encoding.
- 207. Answer: A.** The prediction is limited to the tested range and follows because elaboration and organization create more routes for later retrieval.
- 208. Answer: D.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: operant learning changes behavior according to its consequences.
- 209. Answer: A.** The immediate outcome should match the stated prediction and mechanism: operant learning changes behavior according to its consequences.
- 210. Answer: D.** A valid protocol holds the relevant competing variables steady while measuring reinforcement.
- 211. Answer: C.** The prediction is limited to the tested range and follows because operant learning changes behavior according to its consequences.

- 212. Answer: C.** The distinguishing result should change in the direction predicted by the mechanism while addressing the alternative: sensation begins with detection, while perception includes interpretation shaped by context.
- 213. Answer: B.** The immediate outcome should match the stated prediction and mechanism: sensation begins with detection, while perception includes interpretation shaped by context.
- 214. Answer: B.** A valid protocol holds the relevant competing variables steady while measuring sensory processing.
- 215. Answer: A.** The prediction is limited to the tested range and follows because sensation begins with detection, while perception includes interpretation shaped by context.
- 216. Answer: B.** The absolute threshold is the minimum stimulus intensity detected at a specified level of reliability.
- 217. Answer: A.** Positive reinforcement increases behavior through presentation of a reinforcing consequence.
- 218. Answer: C.** Chunking organizes individual units into meaningful groups that working memory can handle more efficiently.
- 219. Answer: D.** The HPA axis coordinates endocrine responses to prolonged or perceived stress.
- 220. Answer: C.** In-group bias is preferential evaluation or treatment of members of one's own group.
- 221. Answer: B.** Social stratification refers to durable, structured inequality among groups.
- 222. Answer: A.** Chance assignment balances preexisting participant differences on average, supporting causal inference.
- 223. Answer: D.** Formal operational reasoning includes systematic thought about abstract and hypothetical situations.
- 224. Answer: C.** Self-serving bias attributes positive outcomes to the self and negative outcomes to external factors.
- 225. Answer: A.** Groupthink involves pressure toward consensus that can reduce critical evaluation of alternatives.
- 226. Answer: C.** Reliability concerns consistency; validity concerns whether the interpretation is supported.
- 227. Answer: A.** Cognitive dissonance is discomfort from inconsistency among beliefs, actions, or self-image.
- 228. Answer: C.** A narrow volunteer sample may not represent the broader target population.
- 229. Answer: D.** Observational learning occurs through watching and encoding another person's behavior and consequences.

230. Answer: A. Social determinants include conditions and resources that shape exposure and access to care.