Answers and Explanations

ENGLISH TEST

1. *Passage I*

   1. **C**

      Category: Sentence Structure

      Difficulty: Medium

      Getting to the Answer: Choice (C) is the correct and most concise choice. Choice A uses an unnecessary comma. Choice B is unnecessarily wordy. Choice D is redundant—if the societies created the legends, there is no need to describe the legends as "original"—and it uses an unnecessary comma.

   2. **F**

      Difficulty: High

      Category: Development

      Getting to the Answer: The question stem gives an important clue to the best answer: The purpose of the inserted sentence is "to describe

the different kinds" of stories. Choice (F) is the only choice that does this. Choice G explains how the stories were told. Choice H explains why more is not known about the stories. Choice J describes the length of some stories.

3. **D**
   Difficulty: Medium

   Category: Organization

   Getting to the Answer: Choices A and B create run-on sentences. Choice C fixes the run-on, but the cause-and-effect transition does not make sense in context. Choice (D) correctly describes a relationship that makes sense between our "many more permanent ways of handing down our beliefs" and the fact that "we continue to create and tell legends," and it creates a complete sentence.

4. **F**
   Difficulty: Low

   Category: Conciseness

   Getting to the Answer: A colon is used to introduce a short phrase, quotation, explanation, example, or list. The sentence is correct as written because "the urban legend" is the writer's example of "a new form of folktale." Choices G, H, and J add unnecessary words a er the colon.

5. **D**

   Difficulty: Medium

   Category: Sentence Structure

   Getting to the Answer: If an underlined segment contains punctuation, check to make sure it is correct. The semicolon needs to be changed to a colon; colons are used to introduce a short phrase, quotation, explanation, example, or list. The phrase "a Friend of a Friend" explains what the acronym FOAF stands for, so a colon is necessary. Choices A, B, and C do not include the necessary colon.

6. **G**

   Difficulty: Low

   Category: Conciseness

   Getting to the Answer: Choices F, H, and J are all redundant. The word *conclusion* is unnecessary because the word *ending* has already been used, so (G) is correct.

7. **B**

   Difficulty: Medium

   Category: Agreement

   Getting to the Answer: Choice (B) is the only choice that is consistent with the past tense established by *knew* and *decided*. Choices A, C, and

D use incorrect verb tenses.

8. **J**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Choice F creates a run-on sentence and also makes it seem that the hunter, not the deer, "was only temporarily knocked unconscious by the car." Choices G and H use incorrect verb tenses. Choice (J) fixes the run-on and the modifying phrase confusion.

9. **A**

Difficulty: High

Category: Sentence Structure

Getting to the Answer: The sentence is correct as written. Choice B is incorrect because the words preceding the semicolon are not a complete sentence on their own. Choice C creates a sentence fragment. Choice D creates a run-on sentence.

10. **J**

Difficulty: High

Category: Development

Getting to the Answer: Eliminate choices F and G because they do not clearly convey the legend; they do not specifically state how the baby alligators found their way to city sewers. Choices H and (J) describe how the alligators came to live in sewers, but H is too formal and wordy. Choice (J) is correct.

11. **C**
Difficulty: Medium

Category: Agreement

Getting to the Answer: The subject of the sentence is *One*, so the verb must be singular, which matches (C). Choice A incorrectly uses a plural verb. Choices B and D use incorrect verb tenses.

12. **G**
Difficulty: Low

Category: Agreement

Getting to the Answer: Choice F creates a sentence that does not make sense, as it incorrectly uses the adjective *supposed* to describe the verb *copied*. Choices H and J incorrectly use the plural *women* instead of the singular *woman*. Choice (G) uses the correct noun and adverb.

13. **B**
Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Choices A and D misplace the modifying phrase "Dedicated to commonly told urban legends," which should describe the *websites*, and C is not clear. Choice (B) provides the most clear and correct option.

14. **H**
Difficulty: High

Category: Organization

Getting to the Answer: Paragraph 4 describes an urban legend that is "humorous in nature." Paragraph 5 describes a rather frightening legend: alligators living underneath the city in the sewer system. The sentence "Other urban legends seem to be designed to instill fear" is an appropriate topic sentence for Paragraph 5, and it also serves as a needed transition between Paragraph 4 and Paragraph 5. Therefore, (H) is correct.

15. **C**
Difficulty: Medium

Category: Development

Getting to the Answer: Although Paragraphs 1 and 2 provide a bit of general information about the purpose and topics of the myths and

legends of primitive societies, no specifics are given. This makes (C) the correct answer.

7. *Passage II*

16. **H**
Difficulty: Medium

Category: Agreement

Getting to the Answer: Choice (H) correctly pairs a singular verb with a singular subject, and the pronoun *you* matches how the author addresses the reader throughout the first paragraph. Choices F and G are grammatically incorrect. Choice J uses both a verb tense and pronoun that do not match the surrounding text.

17. **B**
Difficulty: Medium

Category: Organization

Getting to the Answer: If a transition is underlined, check to make sure it is logical in context. As written, the sentence does not make sense. Only (B) conveys the writer's intended meaning: a hypothetical. Choice C indicates a contrast the writer is not making, and D is not logical.

18. **H**

Difficulty: Medium

Category: Conciseness

Getting to the Answer: As written, the sentence is redundant because *solitary* and *living alone* have the same meaning. Eliminate J because it is even wordier than the original. Choice G is more concise, but it creates a run-on sentence. Choice (H) provides the most concise, clear answer.

19. **D**
    Difficulty: Low

    Category: Sentence Structure

    Getting to the Answer: Items in a list must be punctuated properly. In this sentence, a comma is required a er the words *born* and *taxes*, so (D) is correct. Choices A, B, and C do not offer correct punctuation.

20. **J**
    Difficulty: Medium

    Category: Sentence Structure

    Getting to the Answer: As written, the sentence is a run-on. Choice (J) offers a common fix for run-ons: a FANBOYS conjunction (in this case, the word *and*) as well as a comma. Choice G deletes the word *and*, which does not fix the run-on. Choice H inserts a semicolon, which can

fix a run-on, but the semicolon should not be paired with a FANBOYS conjunction.

21. **B**

Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: The phrase *in fact* is nonessential, so it should be set off by commas, as shown in (B). Choices A, C, and D do not punctuate the phrase correctly.

22. **G**

Difficulty: Medium

Category: Development

Getting to the Answer: This question provides four adverbs to chose from, only one of which is correct based on the context. The writer is saying that Thoreau is distinctly American, which matches (G). Choices F, H, and J do not reflect the writer's intended meaning; *uniformly* implies that Thoreau was following other people's ideas, *obliquely* means indirectly, and *deplorably* means shamefully.

23. **D**

Difficulty: Low

Category: Sentence Structure

Getting to the Answer: The phrase "In 1845 Thoreau, built a cabin" places the comma in the wrong spot—the comma should appear a er the introductory phrase "In 1845." Choice (D) corrects the error and does not introduce new issues. Choice B puts a comma a er the introductory phrase, but introduces a new error by placing an unnecessary comma a er *cabin*. Choice C is incorrect because moving *in 1845* a er *Thoreau* creates an unclear sentence that is not grammatically correct.

24. **J**
   Difficulty: Medium

   Category: Sentence Structure

   Getting to the Answer: As written, the sentence correctly joins two independent clauses with a semicolon. The clauses can also be punctuated using a dash, joined with a comma and FANBOYS conjunction, or separated by a period. The clauses cannot be separated by just a comma because it creates a run-on sentence, so (J) is correct.

25. **C**
   Difficulty: High

   Category: Organization

   Getting to the Answer: Sentence 3 logically follows sentence 1. Choice (C) is the only choice that lists this correct order.

26. **F**

   Difficulty: Medium

   Category: Sentence Structure

   Getting to the Answer: There is one independent clause on each side of the semicolon, so the sentence is punctuated correctly. Choices G, H, and J create run-on sentences.

27. **B**

   Difficulty: Medium

   Category: Organization

   Getting to the Answer: When a transition is underlined, read the sentence for context to determine what type of transition is needed. The sentence requires a contrast transition, so you can eliminate A and C. Choices (B) and D offer contrast transitions, but D is too wordy. Choice (B) is correct.

28. **F**

   Difficulty: Medium

   Category: Agreement

   Getting to the Answer: When a pronoun is underlined, check to see if it makes sense in context. The sentence is correct as written because

the writer addresses the reader as *you*, as seen in the introductory paragraph. Choices G, H, and J unnecessarily shi   the pronoun.

29. **D**

Difficulty: Medium

Category: Development

Getting to the Answer: This paragraph discusses Thoreau's impact on modern society; only (D) expresses the correct topic.

30. **G**

Difficulty: High

Category: Development

Getting to the Answer: The use of questions prompts a reader to think about the answers to those questions, so (G) is correct. Choice F is too literal, and J is out-of-scope for the topic of the essay. Choice H is incorrect because the writer establishes the quality of Thoreau's work.

3. *Passage III*

31. **D**

Difficulty: Medium

Category: Conciseness

Getting to the Answer: Because the word *live* is used later in the sentence, A, B, and C contain redundant information. Choice (D) is correct.

32. **H**
    Difficulty: Low

    Category: Agreement

    Getting to the Answer: In this sentence, the *its* must be possessive because the *unique anatomy* belongs to the sloth. The word describing the noun *anatomy* must be an adjective, not an adverb. Choice (H) is the only choice that meets both requirements.

33. **A**
    Difficulty: Medium

    Category: Sentence Structure

    Getting to the Answer: The comma is correctly used in (A) to separate the nonessential descriptive phrase "about the size of a large domestic cat" from the rest of the sentence. Choices B, C, and D do not offer correct punctuation.

34. **H**
    Difficulty: Medium

    Category: Sentence Structure

Getting to the Answer: Choices F, G, and J all misplace the modifying phrase "specifically designed for limbs." Choice (H) clearly and directly expresses how the sloth's muscles are designed to allow this animal to cling to things.

35. **D**
Difficulty: Low

Category: Development

Getting to the Answer: The question provides four words, and you must choose the word that best fits the context of the sentence. The sentence indicates that the sloth's limbs have a distinct design that makes it easy for them to live in the trees. Choice (D), *specifically*, reflects this idea. Choices A, B, and C do not make sense in context; *defiantly* means resistantly or disobediently, *enthusiastically* means eagerly, and *painstakingly* means very carefully.

36. **G**
Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: As written, the underlined portion includes an unnecessary comma a er *crawl* in the compound verb *crawl or drag*, so F is incorrect. Eliminate H because it does not remove the unnecessary comma, and it adds an additional unnecessary comma. Choice J removes the comma a er *crawl*, but it adds an unnecessary

comma after *itself* and omits the necessary comma after *Instead*. Choice (G) correctly retains the comma after the introductory transition "Instead" and deletes the comma after *crawl*.

37. **D**

    Difficulty: Medium

    Category: Organization

    Getting to the Answer: Choice (D) is the only choice that correctly establishes the relationship between the sloth's inability to "move swiftly on the ground" and its ability to swim.

38. **G**

    Difficulty: High

    Category: Development

    Getting to the Answer: Choice (G) is the only choice that connects the sloth's unique characteristics discussed in Paragraph 3 with the description of its flexibility in Paragraph 4.

39. **D**

    Difficulty: Medium

    Category: Conciseness

Getting to the Answer: Choice A can be eliminated because it is unnecessarily wordy. Choice C is a bit more concise, but (D) is even more concise than C. Choice B is a short option, but it includes an incorrect shi   in verb tense.

40. **J**
    Difficulty: Medium

    Category: Agreement

    Getting to the Answer: Choice (J) is the only choice that reflects the present tense, which is consistent with the sentence.

41. **D**
    Difficulty: Low

    Category: Sentence Structure

    Getting to the Answer: As written, the sentence is a fragment. Choices B and C each lack a complete verb phrase. Only choice (D) corrects the run-on.

42. **J**
    Difficulty: Medium

    Category: Development

Getting to the Answer: This information about the howler monkey is irrelevant to the topic of the passage.

43. **B**

    Difficulty: Medium

    Category: Sentence Structure

    Getting to the Answer: Choice A creates a sentence fragment. Choice C is unnecessarily wordy and awkward. Choice D creates a run-on sentence. Choice (B) changes the period to a comma to correctly combine the clauses.

44. **G**

    Difficulty: Medium

    Category: Development

    Getting to the Answer: The last sentence aptly concludes the entire passage, and removing it would end the essay before the author provides a concluding expression.

45. **C**

    Difficulty: High

    Category: Organization

Getting to the Answer: The description of the sloth's camouflage is in Paragraph 5, so (C) is correct. Choices A, B, and D each place the sentence in an illogical spot.

9. *Passage IV*

46. **F**
Difficulty: Medium

Category: Conciseness

Getting to the Answer: The underlined portion is best le   as is, so (F) is correct. The other answer choices make the sentence unnecessarily wordy.

47. **B**
Difficulty: Low

Category: Agreement

Getting to the Answer: The verb tense must agree with the tense that has been established up to this point. The passage is in the past tense, so (B) is correct. Choices A, C, and D to do not reflect the correct tense.

48. **H**
Difficulty: Medium

Category: Agreement

Getting to the Answer: As with the answer to the previous question, the simple past tense is needed, so (H) is correct. Choices F and G use the incorrect tense, and J creates a fragment.

49. **C**
Difficulty: Medium

Category: Sentence Structure

Getting to the Answer: Choice A contains a sentence fragment and uses an incorrect present verb tense. Choice (C) fixes both issues. Choice B fixes the fragment but uses the incorrect verb tense. Choice D fixes the verb tense but incorrectly uses a semicolon, as the words preceding the semicolon do not constitute an independent clause.

50. **H**
Difficulty: High

Category: Sentence Structure

Getting to the Answer: In the context of the rest of the passage, only (H) makes sense by correctly placing the modifying word *only*. The firefighters' attempts to extinguish the flames failed; only nature could stop the fire with the first snowfall.

MATHEMATICS TEST

1. B. Substitute x = 5 into the expression 7x + 3. Calculate 7(5) + 3 = 35 + 3 = 38.

2. H. Solve the equation 6y - 8 = 28 by first adding 8 to both sides to get 6y = 36. Then divide both sides by 6 to get y = 6.

3. C. To find 25% of 160, convert the percentage to a decimal (0.25) and multiply: 0.25 × 160 = 40.

4. F. Distribute 8 through the parentheses: 8(x - 5) = 8·x - 8·5 = 8x - 40.

5. D. A 30% discount means the customer pays 70% of the original price (100% - 30% = 70%). Calculate 0.70 × $80 = $56.

6. G. Use the slope formula m = $(y_2 - y_1)/(x_2 - x_1)$ with points (-3, 2) and (5, 18). Substituting gives m = (18 - 2)/(5 - (-3)) = 16/8 = 2.

7. A. Substitute x = 3 into the function g(x) = $2x^2$ + 3x - 1. Calculate g(3) = $2(3)^2$ + 3(3) - 1 = 2(9) + 9 - 1 = 18 + 9 - 1 = 26.

8. J. First evaluate the expression inside the absolute value: 8 - 15 = -7. The absolute value of -7 is 7.

9. B. The area of a triangle is A = (1/2) × base × height. Substituting gives A = (1/2) × 16 × 11 = 88 cm^2.

10. H. Solve 7x + 4 = 3x + 24 by first subtracting 3x from both sides to get 4x + 4 = 24. Subtract 4 from both sides to get 4x = 20. Divide by 4 to get x = 5.

11. D. The area of a circle is A = πr^2. Substituting r = 10 and $\pi \approx$ 3.14 gives A = 3.14 × $(10)^2$ = 3.14 × 100 = 314 in^2.

12. F. Factor the quadratic x^2 - 9x + 20. Looking for two numbers that multiply to 20 and add to -9, we get -4 and -5. So (x - 4)(x - 5) = 0, meaning both (x - 4) and (x - 5) are factors.

13. C. To find the percentage, divide the number who received an A by the total: 32/80 = 0.40 = 40%.

14. G. The two points (-4, 3) and (5, 3) have the same y-coordinate, so they lie on a horizontal line. The distance between them is the absolute value of the difference in x-coordinates: |5 - (-4)| = |9| = 9.

15. B. To find the mean GPA, calculate the weighted average. Total students = 10 + 35 + 27 + 8 + 3 = 83. Sum of grade points = 10(4.0) + 35(3.0) + 27(2.0) + 8(1.0) + 3(0.0) = 40 + 105 + 54 + 8 + 0 = 207. Mean GPA = 207/83 ≈ 2.49, which rounds to approximately 2.5.

16. G. The base of triangle XYZ is XZ = XS + SZ = 3 + 12 = 15 units. Using the area formula: Area = (1/2) × base × height, we get 45 = (1/2) × 15 × YS. Simplifying: 45 = 7.5 × YS, so YS = 45/7.5 = 6 units.

17. A. If 4/7 of a number equals 28, set up the equation (4/7)n = 28. Multiply both sides by 7/4 to get n = 28 × (7/4) = 196/4 = 49.

18. H. Calculate 3^6 by multiplying 3 by itself six times: $3 \times 3 \times 3 \times 3 \times 3 \times 3 = 729$.

19. B. This composite shape can be divided into three simple shapes. By drawing two perpendicular line segments down from the endpoints of the side that is 10 units long, you are left with a 3×10 rectangle, a triangle with a base of 4 and a height of 3, and a triangle with a base of 7 and a hypotenuse of $7\sqrt{2}$.

The rectangle has an area of $3 \times 10 = 30$ square units.

The smaller triangle has an area of $(1/2)(4 \times 3) = 6$ square units.

The larger triangle is a 45°-45°-90° triangle, so the height must be 7. Therefore, it has an area of $(1/2)(7 \times 7) = 24.5$ square units.

The entire shape has an area of $30 + 6 + 24.5 =$ **60.5 square units**.

20. F. Let the five consecutive odd integers be n, n+2, n+4, n+6, and n+8. Their sum is n + (n+2) + (n+4) + (n+6) + (n+8) = 75. Simplifying: 5n + 20 = 75, so 5n = 55, and n = 11.

21. B. Use FOIL to expand (x + 8)(x - 5). First: x·x = x^2. Outer: x·(-5) = -5x. Inner: 8·x = 8x. Last: 8·(-5) = -40. Combining gives x^2 - 5x + 8x - 40 = x^2 + 3x - 40.

22. J. If $\log_5(x) = 3$, then by the definition of logarithm, 5^3 = x. Calculate $5^3 = 5 \times 5 \times 5 = 125$.

23. D. Arrange the numbers in order: 17, 19, 21, 23, 25, 29, 31. The median is the middle value (the 4th value out of 7), which is 23.

24. G. The total number of marbles is 9 + 6 + 10 = 25. The probability of selecting a blue marble is 6/25.

25. A. For a right triangle, $\sin^2(\theta) + \cos^2(\theta) = 1$. If $\sin(\theta) = 0.5 = 1/2$, then $(1/2)^2 + \cos^2(\theta) = 1$, so $1/4 + \cos^2(\theta) = 1$. Therefore $\cos^2(\theta) = 3/4$, and $\cos(\theta) = \sqrt{3}/2$ (positive since θ is acute).

26. H. Solve the inequality 5x - 3 > 22 by adding 3 to both sides: 5x > 25. Divide both sides by 5: x > 5.

27. C. For a right triangle with legs a = 9 and b = 12, use the Pythagorean theorem: $c^2 = a^2 + b^2 = 9^2 + 12^2 = 81 + 144 = 225$. Therefore c = $\sqrt{225}$ = 15.

28. F. Substitute x = 3 into $(4x - 1)^2$. First calculate 4(3) - 1 = 12 - 1 = 11. Then square: $11^2 = 121$.

29. B. The sum of interior angles of a polygon with n sides is (n - 2) × 180°. For an octagon (n = 8): (8 - 2) × 180° = 6 × 180° = 1080°.

30. J. If $2^{(x-1)} = 32$, recognize that $32 = 2^5$. So $2^{(x-1)} = 2^5$, which means x - 1 = 5, and therefore x = 6.

31. D. Simplify $\sqrt{98}$ by finding perfect square factors. Since 98 = 49 × 2, we have $\sqrt{98} = \sqrt{(49 \times 2)} = \sqrt{49} \times \sqrt{2} = 7\sqrt{2}$.

32. G. For an arithmetic sequence with first term $a_1 = 9$ and common difference $d = 5$, the nth term is $a_n = a_1 + (n-1)d$. For the 12th term: $a_{12} = 9 + (12-1)(5) = 9 + 55 = 64$.

33. A. To add matrices, add corresponding elements. M + N = [5+2 2+1; 3+4 4+3] = [7 3; 7 7].

34. H. The volume of a sphere is $V = (4/3)\pi r^3$. Substituting $r = 6$ and $\pi \approx 3.14$: $V = (4/3) \times 3.14 \times (6)^3 = (4/3) \times 3.14 \times 216 = 904.32$ cm³.

35. C. Calculate 6 factorial: $6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$.

36. F. The expression $(x - 5)/(x^2 - 25)$ is undefined when the denominator equals zero. Factor the denominator: $x^2 - 25 = (x + 5)(x - 5)$. This equals zero when $x = 5$ or $x = -5$.

37. B. If the angles are in ratio 1:2:3, let them be k, 2k, and 3k. The sum of angles in a triangle is 180°: $k + 2k + 3k = 180°$, so $6k = 180°$ and $k = 30°$. The smallest angle is $k = 30°$.

38. J. For $f(x) = \sqrt{(x - 7)}$ to be defined (as a real number), the expression under the square root must be non-negative: $x - 7 \geq 0$, which means $x \geq 7$.

39. D. If $9^x = 729$, recognize that $729 = 9^3$ (since $9 \times 9 \times 9 = 729$). So $9^x = 9^3$, which means $x = 3$.

40. G. The volume of a rectangular prism is $V = $ length $\times$ width $\times$ height. Calculate $V = 4 \times 5 \times 8 = 160$ cm³.

41. A. To find the LCM of 12 and 18, list multiples. Multiples of 12: 12, 24, 36, 48... Multiples of 18: 18, 36, 54... The least common multiple is 36.

42. H. First evaluate $k(2) = 3(2) + 1 = 6 + 1 = 7$. Then evaluate $h(7) = (7)^2 - 4 = 49 - 4 = 45$.

43. C. If the mean of six numbers is 18, their sum is $6 \times 18 = 108$. The sum of the five known numbers is $12 + 15 + 20 + 22 + 19 = 88$. The sixth number is $108 - 88 = 20$.

44. F. In an isosceles triangle, the two base angles are equal. Let each base angle be x. Then $x + x + 40° = 180°$, so $2x = 140°$, and $x = 70°$.

45. B. Looking at this problem, I need to use properties of circles and isosceles triangles.

Given Information

- O is the center of the circle
- C, D, and E are points on the circumference
- $\angle OCD = 70°$
- $\angle OED = 45°$

Key Insight

Since O is the center, OC, OD, and OE are all radii, which means:

- OC = OD = OE

Finding angles in Triangle OCD

Since OC = OD (both radii), triangle OCD is isosceles.

In an isosceles triangle, the base angles are equal:

- ∠OCD = ∠ODC = 70°

Finding angles in Triangle OED

Since OE = OD (both radii), triangle OED is isosceles.

In an isosceles triangle, the base angles are equal:

- ∠OED = ∠ODE = 45°

Finding ∠CDE

The angle ∠CDE is at vertex D, formed by rays DC and DE.

From the diagram, I can see that: $$∠CDE = ∠CDO + ∠ODE = 70° + 45° = 115°$$

The answer is **115°**

READING TEST

1. *Passage I*

   Suggested Passage Map notes:

   ¶1: Emma (E) 20 yrs old, indulgent father, no mother

   ¶2: Miss Taylor (T) governess 16 yrs like sister; E used to getting own way

   ¶3: T now married

   ¶4: T's husband not exceptional but nice

   ¶5: E very lonely w/o T

   1. **C**
      Difficulty: Medium

      Category: Detail

Getting to the Answer: The answer can be found in lines 31–36: "The real evils, indeed, of Emma's situation were the power of having rather too much her own way, and a disposition to think a little too well of herself; these were the disadvantages which threatened alloy to her many enjoyments." This matches (C). Choices A, B, and D are distortions—they do not directly reflect the author's intended meaning.

2. **G**
Difficulty: Medium

Category: Function

Getting to the Answer: The dinner takes place on the evening of Miss Taylor's wedding day, as "she [Emma] and her father were le   to dine together, with no prospect of a third to cheer a long evening" (lines 47–49). The mood is sad, and Emma longs for the past when Miss Taylor was an integral and enjoyable member of the family. This matches (G). Choice F is out of scope; Emma was certainly sad, but the author never says she was angry. Choices H and J are also out of scope; Emma is not disappointed in her father, and she seems to like Mr. Weston, whom she recognizes as a good man and suitable husband (line 54–56).

3. **B**
Difficulty: Medium

Category: Detail

Getting to the Answer: The answer can be found in lines 20–21: "Between them it was more the intimacy of sisters." Choice (B) is correct. Choice A is a misused detail; while Miss Taylor "had fallen little short of a mother in affection" (lines 15–16), the author does not imply that Miss Taylor loved Emma more than a parent loves a child. Choices C and D are distortions—the author does not make those comparisons in the text.

4. **F**
   Difficulty: Low

   Category: Vocab-in-Context

   Getting to the Answer: As it is used in the sentence, "disposition" means a tendency or inclination. Choices G, H, and J are incorrect because it would not make sense for Emma to have a *control*, *placement*, or *transfer* "to think a little too well of herself" (lines 34–35).

5. **D**
   Difficulty: High

   Category: Detail

   Getting to the Answer: The answer can be found in lines 62–69: "She recalled her past kindness—the kindness, the affection of sixteen years—how she had taught her and . . . how she had devoted all her powers

to attach and amuse her in health—and how she had nursed her through the various illnesses of childhood." Only (D) matches perfectly.

6. **H**
Difficulty: Medium

Category: Detail

Getting to the Answer: The author writes that Emma had "very little to distress or vex her" (line 6), had "a most affectionate, indulgent father" (lines 7–8), and "an excellent governess who had fallen little short of a mother in affection" (lines 14–16). All this adds up to a happy life, which matches answer choice (H). Choice F is opposite. Choice G is opposite because the author writes that Emma does what she pleases without needing permission, and J is out of scope: there is no evidence that Emma is confused.

7. **C**
Difficulty: Medium

Category: Inference

Getting to the Answer: Emma is described as "having rather too much her own way" (line 33), which matches (C). Choice A is opposite because *obedient* and *headstrong* are antonyms. Emma's love for Miss Taylor shows her appreciation of her, making B incorrect. Lines 2–4 speak of Emma's happy life, so she would not be bitter, eliminating D.

8. **G**

   Difficulty: Medium

   Category: Inference

   Getting to the Answer: Emma's description of her friendship with Miss Taylor suggests that Emma most highly values devotion—(G)—in her friends, as evidenced in lines 78–82. Choice F is a misused detail: Emma mentions that Miss Taylor is intelligent, but Emma does not indicate that intelligence is most highly valued. While H and J are plausible, there is no direct evidence in the text to support those answers.

9. **B**

   Difficulty: Medium

   Category: Detail

   Getting to the Answer: The description of Mr. Weston is in lines 53–56: "The marriage had every promise of happiness for her friend. Mr. Weston was a man of unexceptionable character, easy fortune, suitable age, and pleasant manners." Choice (B) matches. Choices A, C, and D do not reflect this description.

10. **H**

    Difficulty: Medium

    Category: Inference

Getting to the Answer: In lines 25–26, when describing the relationship between Emma and her governess, Miss Taylor, the author writes that the "shadow of authority" was "now long passed away," meaning that Emma is no longer under the control of Miss Taylor. As for Emma's father, he was "affectionate" and "indulgent," another person whose permission Emma would not need. The correct answer then is (H), which describes Emma as her own independent person. Choice F is out of scope; there's no reference to her father's wishes. Choice G is tempting, but the author writes that though Emma "highly esteemed" Miss Taylor's advice, she goes her own way. Choice J is opposite of the information in the passage.

2. *Passage II*

Suggested Passage Map notes:

Passage A

¶1: 1903 - W bros successful

¶2: other inventors tested models

¶3: W bros tested 1 aspect at a time

¶4: W bros invented wind tunnel

¶5: no guesswork

Passage B

¶1: peopled doubted W bros

¶2: companies fought W bros patent

¶3: finally, public support, but a er death

11. **B**
Difficulty: Medium

Category: Global

Getting to the Answer: Passage A discusses the Wright brothers' process for designing a successful airplane; (B) is correct. Although the passage mentions how the Wright brothers were regarded, A, this information appears in the first paragraph only, and is not the main focus of the passage. The passage discusses the approaches used by other inventors, but the author does not criticize them, as represented in C. The practical application of science, D, is too broad to be correct.

12. **H**
Difficulty: High

Category: Vocab-in-Context

Getting to the Answer: When answering a Vocab-in-Context question, be sure to read the word in the context of the sentence in which is

appears. The word *jaded* is followed by "tired of investigating each yokel who claimed to have made an airplane," and the next sentence describes a reporter who is so bored with attempts at flight that he does not even touch his camera. Based on this context, *jaded* means something like bored or uninterested, which matches (H). Choice F is opposite. Choice G is out of scope; something made of jade may be valuable but this is irrelevant to the passage. Choice J implies enough interest to have a negative opinion, and *jaded* means lack of interest, so J is incorrect.

13. **B**

   Difficulty: High

   Category: Inference

   Getting to the Answer: The passage says that the Wright brothers invented the wind tunnel as an alternative to building and testing "whole machines." They tested only parts of their design in the tunnel, such as wing shape. You can infer that the wind tunnel made it possible for them to deal with their airplane design one piece at a time, which matches (B). The author never implies that the data from the kites, A, was inaccurate. To work on controlling the plane laterally, they used a five-foot biplane kite rather than the wind tunnel, which rules out C. Choice D is opposite; they disproved a commonly accepted theory of li (called Smeaton's coefficient).

14. **F**

   Difficulty: High

Category: Function

Getting to the Answer: Passage B deals mainly with how the Wright brothers were treated publicly following their discovery. The "legal battle" is mentioned as another example of how the brothers did not receive the money and respect they deserved for their important contribution, (F). The author does not imply that it is unwise to publicize knowledge, G. Choice H is opposite; the author feels that their discovery was quite important. Choice J is not directly related to the court case.

15. **C**
   Difficulty: Medium

   Category: Inference

   Getting to the Answer: In the last paragraph, the author states that "this was too little, too late," which suggests that the honor did not properly compensate for the poor treatment of the brothers, (C). It was not a victory for Orville, A, because both brothers had passed away by 1948. The Smithsonian's choice was not a result of the refusal to recognize the brothers' achievements, B, because it was a great honor. There is no evidence to suggest that the cra   would have been displayed sooner if European countries had issued the brothers a patent, D.

16. **J**
   Difficulty: High

Category: Inference

Getting to the Answer: The passage talks about how "those who made airplanes" thought little of the Wright brothers' accomplishments. In lines 98–100, it says the brothers went through an "unfair period of ridicule and doubt and the obstinate refusal by much of the world to acknowledge their achievements." This suggests that others characterized the Wright brothers as "unlikely pioneers of flight," (J). It also cancels out F, G, and H, which suggest positive assessments of the Wright brothers.

17. **B**
   Difficulty: Medium

   Category: Inference

   Getting to the Answer: The passage says "the prevailing opinion among those who made airplanes was that two rustic, uneducated fellows from Ohio could never have accomplished such an historic feat except by accident." From this, you can infer that those who made airplanes did not think that the Wright brothers were exceptional; in their eyes, the brothers' discovery must have been sheer luck, not the result of scientific experimentation, which matches (B). Eliminate A because the passage never says that they thought the Wrights had not made a working airplane, only that they thought little of the accomplishment. Choice C is opposite; they had a negative opinion of the Wrights' breakthrough. Choice D is a distortion; they felt the brothers were lucky, not dishonest.

18. **H**

    Difficulty: Low

    Category: Vocab-in-Context

    Getting to the Answer: The authors state that the Wrights were able to "marry all of these carefully designed components into a complete cra " (lines 61–63) and "deliberately marry the disparate components of air travel that are required for successful flight" (lines 74–76). So the Wright brothers brought together all the separate pieces into a whole airplane. Predict that *marry* means "bring together," (H). The airplane did prove, F, that the components worked when together, but it does not make sense to say that the brothers were able to deliberately prove the components. The Wright brothers had already rigorously tested each component separately, so G is incorrect. Airplane components cannot be satisfied, so J does not work.

19. **B**

    Difficulty: Medium

    Category: Detail

    Getting to the Answer: At the beginning of Paragraph 3, Passage A states, "The Wright brothers proved to be adept scientists. With their keen analytical insight and love of engineering and all things mechanical, they were able to escape that endless loop of misguided "improvements."" This matches perfectly with (B). Choice A describes the approach that other, unsuccessful inventors used. Passage A does

not provide evidence that the invention of the wind tunnel was a greater accomplishment than the airplane, C. The court case cited in D is included in Passage B, not in Passage A.

20. **H**
Difficulty: Low

Category: Inference

Getting to the Answer: Wrong answer choices for this type of question are commonly those that are true for one passage but not the other. Both passages agree that the Wright brothers did something great that no one else was capable of at the time, which is reflected in (H). The brothers' method of inquiry, F, is discussed in Passage A only. Choices G and J are included in Passage B, but not in Passage A.

3. *Passage III*

Suggested Passage Map notes:

¶1: photography not traditional, so allowed women

¶2: Cameron (C) 1st famous woman photographer

¶3: C's work notable in Victorian period

¶4: Victorian critics liked C's allegorical pics; today's critics prefer C's portraits

21. **B**

Difficulty: Medium

Category: Inference

Getting to the Answer: In lines 10–11, Julia Margaret Cameron is described as "the first woman to have achieved eminence in photography," which matches (B). Choices A, C, and D contradict information supplied in the passage.

22. **F**

Difficulty: Medium

Category: Detail

Getting to the Answer: The answer to this question can be found in lines 72–73, "Contemporary taste much prefers her portraits . . ." and in line 78, "today her fame rests upon her portraits . . ." Choices G, H, and J do not match the information regarding modern critics' opinions.

23. **D**

Difficulty: High

Category: Function

Getting to the Answer: The dates used in the passage tell you that this is a chronological account; the author begins with Cameron's birth in 1815, and then tells of her marriage and her move to England in 1848.

The author points out that she received her first photographic equipment in 1863, describes one of her photographs from 1864, and then concludes the paragraph with her death in 1874. Only (D) matches the method the author uses.

24. **F**
Difficulty: Medium

Category: Vocab-in-Context

Getting to the Answer: The passage indicates that "cumbersome" means not easy to handle. Choice (F) most closely fits this definition, and it is the only answer choice that makes sense within the context of the sentence.

25. **B**
Difficulty: Medium

Category: Detail

Getting to the Answer: Line 49 describes how Cameron "devoted herself wholly to this art," which matches (B). Choice A contradicts information from the passage, which suggests that Cameron led anything but a conventional life. Neither the money that Cameron earned as a photographer nor her religious beliefs are discussed in the passage, making C and D incorrect.

26. **F**

Difficulty: Medium

Category: Global

Getting to the Answer: Lines 53–55 say, "she produced a large body of work that stands up as one of the notable artistic achievements of the Victorian period," which matches (F). Choice G is incorrect because to say that she "is the greatest photographer who ever lived" goes beyond anything stated or implied in the passage. The third paragraph does not compare her importance as an artist during her lifetime to her importance today, so H is incorrect. You can eliminate J because the passage also does not state that she "revolutionized" any photographic methods.

27. **D**
    Difficulty: Medium

    Category: Function

    Getting to the Answer: Think about how the author supports this choice of words: he writes that "women artists have been most prominent in photography and that they have made their greatest contribution in this field," (lines 1–3) and that photography was "outside the traditional academic framework," thus "wide open to women" (lines 7–8). So photography, the new medium, was a field not overpopulated or controlled by men, offering women an area in which they could not only participate but also shine, as (D) states. Choice A is a faulty use of detail; the "new medium" refers to opportunities for

women, not to general popularity. Choice B is true, but not why the author used the words he chose. Choice C is out of scope; Cameron took photographs in order to represent "not only the outer likeness but also the inner greatness of the people she portrayed" (lines 80–81), not to be a trendsetter.

28. **G**

Difficulty: Low

Category: Function

Getting to the Answer: These titles refer to allegorical pictures, as described in lines 69–72: "Victorian critics were particularly impressed by her allegorical pictures, many of them based on the poems of her friend and neighbor Tennyson." This information matches (G). Choices F, H, and J are incorrect because they are not relevant to allegorical pictures.

29. **D**

Difficulty: Medium

Category: Detail

Getting to the Answer: The answer to this question can be found in lines 72–74: "Contemporary taste much prefers her portraits and finds her narrative scenes sentimental and sometimes in bad taste." Only (D) matches perfectly. Choice A is a distortion. While the photographs were based on poems, the author doesn't say that the Victorian critics

thought that photographs *should* be based on poems. Choice B is opposite; modern critics like her portraits because they are not sentimental. Choice C is opposite; modern critics, not Victorian critics, thought her narrative scenes were in bad taste.

30. **F**
    Difficulty: Low

    Category: Inference

    Getting to the Answer: The author says that Cameron "achieved eminence" (line 11) in her field, that she "devoted herself wholly to this art" (line 49) and that "no other woman photographer has ever enjoyed such success" (lines 63–66). Only (F) fits with these descriptions. Choices G and J are too negative, and H is not positive enough.

4. *Passage IV*

    Suggested Passage Map notes:

    ¶1: harbor seal adapted

    ¶2: quadraphonic hearing = pinpoint location

    ¶3: eye refracts light in water = better vision

    ¶4: echolocation

¶5: whiskers sense vibration

31. **C**

Difficulty: Low

Category: Detail

Getting to the Answer: For details about the eye, look at Paragraph 3. Only the cornea and stenopaic pupil are relevant, eliminating A and D. The cornea, B, is helpful underwater, not on land. Choice (C) is correct.

32. **G**

Difficulty: Medium

Category: Inference

Getting to the Answer: The eye is covered in Paragraph 3. The seal's cornea improves vision in the water (note the comparison to human underwater vision), but it distorts light moving through the air. Another adaptation was then needed to "minimize" (line 46) distortion, but that does not mean distortion is completely eliminated, so the seal's vision in the air is distorted, (G). Choice F is opposite, and H and J do not reflect the correct comparison.

33. **D**

Difficulty: Low

Category: Detail

Getting to the Answer: The vibrissae are discussed only in paragraph 5. Seals sense wave disturbances made by nearby moving fish, so (D) is correct. Choice A is a misused detail; underwater vision is mentioned in paragraph 3, not paragraph 5. Choice B, by using the phrase "in the air," distorts information in the passage. Choice C is incorrect because camouflage is not mentioned in the passage, so it is out of scope.

34. **F**

Difficulty: Low

Category: Detail

Getting to the Answer: The correct answer, (F), is stated in the second paragraph, where the seal's hearing is discussed. Choices G and H contradict the information in the passage, and J does not make sense because the speed of sound can be calculated.

35. **D**

Difficulty: Medium

Category: Detail

Getting to the Answer: This appears in the first paragraph, which introduces the influences on the seal's adaptations. They include that the seal "does most of its fishing at night," that "noise levels are high," and that these factors are compounded by the seal's "two habitats," so all three statements are correct. Choice (D) is the only option that includes all three.

36. **H**

   Difficulty: Medium

   Category: Inference

   Getting to the Answer: Choice (H) is "suggested" as an opinion scientists hold (lines 57–64). Choice G is a fact from the passage. Choices F and J are distortions of information in the passage.

SCIENCE TEST

1. *Passage I*

   1. **B**
      Difficulty: Medium

      Category: Data—Detail & Interpretation

      Getting to the Answer: To answer this question, you have to examine the third column of Table 1, transmittance range. For a material to transmit light at a wavelength of 25 μm, its transmittance range—the range of wavelengths over which the material is transparent—must include 25 μm. Only potassium bromide (0.3–29 μm) and cesium iodide (0.3–70 μm) have transmittance ranges that include 25 μm, so (B) is correct.

   2. **F**
      Difficulty: Medium
      Category: Data—Inference & Calculation

      Getting to the Answer: The material that contradicts the hypothesis will have poor chemical resistance but a transmittance range less than 10 μm. Lithium fluoride, (F), fits the bill: its chemical resistance is poor, and its transmittance range is less than 6 μm wide. Choices G and J are wrong because both flint glass and quartz have excellent chemical resistance. Choice H is out because cesium iodide has a transmittance range nearly 70 μm wide.

3. **D**

   Difficulty: High

   Category: Data—Detail & Interpretation

   Getting to the Answer: The correct answer will be a pair of materials in which the refractive index of the first material is greater than that of the second. In A, B, and C, the refractive index of the first material is less than that of the second. In (D), however, flint glass has a refractive index of 1.66 while calcium fluoride's refractive index is only 1.43. That makes (D) the correct answer.

4. **J**

   Difficulty: Medium

   Category: Data—Detail & Interpretation

Getting to the Answer: The easiest way to answer this question is to examine the first few materials in the table and test each hypothesis on them. Choices F and G are incorrect because the transmittance range of lithium fluoride is wider than its useful prism range. Comparing the data on lithium fluoride and calcium fluoride rules out H because transmittance range does NOT increase as useful prism range decreases. In fact, based on other values in the table, transmittance range seems to *decrease* as useful prism range decreases. Choice (J) is the only one le , and the data on lithium fluoride and calcium fluoride (as well as all the other materials) confirm that the transmittance range is always wider than, and includes within it, the useful prism range.

5. **B**
   Difficulty: High

   Category: Data—Detail & Interpretation

   Getting to the Answer: According to the footnote to Table 1, quartz infused with lead oxide is flint glass. Comparison of the properties of pure quartz and flint glass shows that the transmittance range of flint glass is narrower than that of quartz, but its refractive index is greater. This supports (B).

6. **G**
   Difficulty: Medium

   Category: Data—Detail & Interpretation

Getting to the Answer: Begin this question by looking at the answer choices and finding the transmittance range and useful range for prisms for lithium fluoride, sodium chloride, quartz, and flint glass. A quick glance at the chart shows that the ranges for lithium fluoride (for transmittance and prisms, respectively) are slightly below 6 and less than 3. Sodium chloride shows ranges of 16.7 and 8. Quartz has ranges of 3.1 and 2.5, while flint glass has ranges of less than 2 for both categories. Therefore, sodium chloride, (G), is the correct answer.

8. *Passage II*

7. **D**
Difficulty: High

Category: Experiments—Synthesizing Data

Getting to the Answer: Because a higher temperature leads to a higher osmotic pressure at a given concentration, as seen in Table 1, statement I is false and choice A can be eliminated. (This can also be determined by noticing the direct relationship between Π and T in the equation.) Statement II suggests that temperature must be decreased to keep the osmotic pressure constant when concentration is increased. According to the given equation, osmotic pressure (Π) is simply equal to the concentration (M), a constant (R), and the temperature (T) multiplied together. That means that increasing the concentration will normally just increase the osmotic pressure. However, if the temperature is lowered by the appropriate amount, it could offset the increase in osmotic pressure that would be caused by

a concentration increase. Because R is a constant, it can never change, so only decreasing the temperature would allow the osmotic pressure to stay constant with an increasing concentration. Consequently, statement II is true, which means choice C can be eliminated. For statement III, Tables 1 and 2 both show that higher concentrations result in higher osmotic pressures at constant temperature. (This can also be seen by noticing the direct relationship between Π and M in the equation.) Because statement III is also true, (D) is correct.

8. **H**
   Difficulty: Medium

   Category: Experiments—Synthesizing Data

   Getting to the Answer: Use the results of both experiments to answer this question. The answer choices all involve temperature, concentration, and solvent in different combinations. To determine whether osmotic pressure is dependent upon a variable, look for a pair of trials in which all conditions except for that variable are identical. In doing so, you can see that temperature and concentration affect osmotic pressure, but choice of solvent does not. Choice (H) is correct.

9. **C**
   Difficulty: Low

   Category: Data—Detail & Interpretation

Getting to the Answer: Find methanol at 0.5 mol/L, which is in Table 2. The text above the table states that all the trials were conducted at the same temperature (298 K). Therefore, simply look across the row that you identified. The osmotic pressure (the minimum external pressure required to prevent osmosis) is 12.23, choice (C).

10. **G**
Difficulty: High

Category: Experiments—Synthesizing Data

Getting to the Answer: To figure out what will happen under the conditions described in the question, go back to the definition of osmotic pressure given in the introduction. Once the external pressure reaches the osmotic pressure, osmosis will not occur. In order for osmosis to occur, then, the external pressure must be less than the osmotic pressure of the solution. The solution in this question is a 0.10 mol/L aqueous sucrose solution at 298 K; according to Table 1, those conditions correspond to an osmotic pressure of 2.45 atm. Because the external pressure is 1 atm, which is less than the osmotic pressure, osmosis will occur. From the definition of osmosis in the passage, it is clear that the solution will diffuse from the side of the membrane with a lower concentration of dissolved material (in this case, pure water) to the side with a higher concentration (in this case, the sucrose solution). Choice (G) is correct.

11. **C**
Difficulty: Medium

Category: Experiments—Design & Methodology

Getting to the Answer: To determine what the scientists investigated in Experiment 1, look at what they varied and what they measured. In Experiment 1, the scientists varied the concentration and the temperature of sucrose solutions, and they measured the osmotic pressure. Therefore, they were investigating the effect of concentration and temperature on osmotic pressure, (C). Watch out for A: it states what was investigated in Experiment 2, not Experiment 1.

12. **F**
    Difficulty: High

    Category: Thinking Like a Scientist—Evaluating Hypotheses

    Getting to the Answer: The results in Table 2 demonstrate that osmotic pressure doesn't depend on the solvent, as indicated by the fact that the values remain constant for a particular concentration irrespective of solvent used. So statement I is a valid conclusion, and G can be eliminated. Statement II is false: The results in Table 1 indicate that osmotic pressure is dependent on concentration as well as temperature. So H can be ruled out. Now consider statement III. It is not a valid conclusion because, according to the definition provided in the passage, osmotic pressure is the minimum pressure required to prevent osmosis, so osmosis will occur only if the external pressure is less than the osmotic pressure. Because only statement I is true, choice (F) is correct.

13. **D**

   Difficulty: Medium

   Category: Experiments—Design & Methodology

   Getting to the Answer: The passage explains that osmotic pressure is equal to the minimum external pressure required to prevent osmosis. In order to measure the osmotic pressure of a solution, scientists need to be able to tell whether osmosis is occurring. If you have two clear solutions, it could be difficult to tell when osmosis has begun to occur, that is, when the solvent begins to move from the less concentrated solution to the more concentrated one. However, if the sucrose is dyed, the blue solution will start to become a lighter shade of blue when osmosis starts. Therefore, (D) is correct.

6. *Passage III*

14. **F**

   Difficulty: Low

   Category: Data—Detail & Interpretation

   Getting to the Answer: The question refers to Experiment 3, so look at Table 3. According to that table, when the temperature is 85°F during the day and 85°F at night, the leaves have the smallest measurements. Choice (F) is correct.

15. **A**

Category: Data—Inference & Calculation

Getting to the Answer: The question refers to Experiment 2 only, so the correct answer will involve sunlight. Neither humidity nor watering is relevant to Experiment 2, so B and C can be eliminated. Table 2 shows that the average length of the leaves increased from 5.3 cm to 12.4 cm as the amount of sunlight increased from 0 to 3 hours per day. But as the amount of sunlight increased further, leaf size decreased. Therefore, D is incorrect, leaving choice (A) as the correct answer. Choice (A) is supported by the data in Table 2 showing that only 3 hours of sunlight resulted in optimal leaf growth.

16. **G**
    Difficulty: Low

    Category: Data—Inference & Calculation

    Getting to the Answer: Table 1 gives leaf widths at 35% and 55% humidity at 1.8 cm and 2.0 cm, respectively. The leaf width at 40% humidity would most likely be between those two figures. Choice (G) is the only option within that range.

17. **B**
    Difficulty: Medium

    Category: Experiments—Synthesizing Data

Getting to the Answer: All the answer choices involve humidity and sunlight, which were investigated in Experiments 1 and 2, respectively. In Table 1, leaf length and width were greatest at 75% humidity. In Table 2, they were greatest at 3 hours per day of sunlight. Combining those two conditions, as in (B), would most likely produce the largest leaves.

18. **F**
Difficulty: Medium

Category: Experiments—Design & Methodology

Getting to the Answer: This question concerns the methods of the studies. Each experiment begins with a statement that five groups of seedlings were used. Therefore, (F) is correct. The other choices list variables that were manipulated in one of the experiments.

19. **D**
Difficulty: High

Category: Experiments—Design & Methodology

Getting to the Answer: Choice (D) is an assumption that underlies the design of all three experiments. If the seedlings were not equally capable of further growth, then changes in leaf size and density could not be reliably attributed to researcher-controlled changes in humidity, sunlight, and temperature. Choice A is incorrect because all

the seedlings were 2–3 cm tall. The seedlings' abilities to germinate, B, or to produce flowers, C, were not mentioned in the passage.

20. **H**
Difficulty: Medium

Category: Experiments—Design & Methodology

Getting to the Answer: According to the first paragraph of the passage, the purpose of the three experiments was "to study the environmental factors affecting the size and number of leaves on the *Cycas* plant." Consequently, to continue in this vein, it would be appropriate to choose another environmental factor to manipulate and to examine its impact on the plant's leaf growth, just as was done in the other experiments. Choice (H) presents exactly such an option, by proposing a study of the impact of soil mineral content on leaf size and density. None of the other choices relate directly to the stated purpose of the experiments.

4. *Passage IV*

21. **B**
Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: According to Table 1, decreasing the cross-sectional area of a given wire always increases resistance, so (B) is

correct. The table also shows that if length decreases, resistance decreases, too, so A is incorrect. Choice C is incorrect because resistivity, displayed in the second column, is constant for each material and thus cannot be responsible for variations in resistance for a given material. Gauge varies inversely with cross-sectional area (as seen in Diagram 1), which means that resistance decreases as gauge decreases, so D is also incorrect.

22. **G**
Difficulty: High

Category: Data—Detail & Interpretation

Getting to the Answer: According to Table 1, resistance increases when resistivity increases and when length increases, but resistance decreases as cross-sectional area increases. The only answer choice that shows a direct relationship between resistance and both resistivity and length (placing both ρ and L in the numerator) and an inverse relationship between resistance and cross-sectional area (placing A in the denominator) is choice (G).

23. **D**
Difficulty: Medium

Category: Data—Detail & Interpretation

Getting to the Answer: Compare the choices two at a time. The wires in A and B are made of the same material and have the same cross-

sectional area; only their length is different. Doubling the length doubles the resistance, as can be seen in Table 1, so B would have a higher resistance than A. By similar reasoning, (D) would have a higher resistance than C. That means both A and C can be eliminated. The only difference between B and (D) is the material. Even though the research team didn't test wires with a 0.33 mm^2 cross-sectional area, Table 1 shows that tungsten wire has higher levels of resistance than aluminum wire when length and area are held constant. Thus, choice (D) is correct.

24. **J**
   Difficulty: Medium

   Category: Data—Detail & Interpretation

   Getting to the Answer: According to Diagram 1, the larger circle with a diameter of 2.59 mm represents 10-gauge wire, while the smaller circle with a diameter of only 1.29 mm represents 16-gauge wire. Consequently, statement I is true, allowing you to eliminate G and H. Statement II must be false since it doesn't appear in any of the remaining choices, and this can be confirmed by comparing the resistivity values for gold (Au) and tungsten (W) in Table 1. For statement III, the table shows that the resistance of an iron (Fe) wire is much higher than that of an aluminum (Al) wire with the same length and cross-sectional area. The first sentence of Paragraph 1 defined the resistance of a conductor as "the extent to which it opposes the flow of electricity." Because iron has a higher resistance than aluminum, iron

must not conduct electricity as well. Therefore, statement III is also true, and (J) is correct.

25. **D**
   Difficulty: Medium

   Category: Detail & Interpretation

   Getting to the Answer: The data indicate that the resistivity of a material doesn't change when wire length changes. Therefore, the graph of resistivity versus length for tungsten (or any other) wire is a horizontal line, as in choice (D).

26. **J**
   Difficulty: Medium

   Category: Data—Detail & Interpretation

   Getting to the Answer: Refer to Table 1 to see the effect that wire length has on resistance. Regardless of wire gauge, resistance increases for each material when length is increased. Choice (J) is thus correct.

1. *Passage V*

27. **A**
   Difficulty: Medium

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: According to Scientist 1, some "mutations result in traits that help the species adapt to environmental changes." Similarly, Scientist 2 states that acquired characteristics inherited by subsequent generations include modifications that result from "changes in the environment." In addition, both scientists use the example of giraffes to show how scarcity of food and the need to reach higher and higher branches led to the evolution of long necks. Thus, both agree that the environment affects evolution, choice (A).

28. **H**
   Difficulty: Medium

   Category: Thinking Like a Scientist—Evaluating Hypotheses

   Getting to the Answer: This question requires you to determine how new evidence affects the two hypotheses. Scientist 2 claims that characteristics acquired by an individual over a lifetime, including "changes that occurred as a result of accidents," are passed on to its offspring. The scenario presented in the question stem describes such an accidental change being passed on to offspring, so Scientist 2's hypothesis would be supported, making choice (H) correct.

29. **D**
   Difficulty: Medium

   Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: Scientist 2 suggests that all of the changes that occur during an individual's life can be passed on to its offspring. The scientist states that such acquired characteristics include "changes that occurred as a result of accidents, changes in the environment, overuse of muscles, and so on." Because Scientist 2 puts no limits on the sort of traits that can be passed on to subsequent generations, it is reasonable to conclude that characteristics I, II, and III can all be inherited, so choice (D) is correct.

30. **G**

Difficulty: Medium

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: According to the passage, Scientist 1 claims that random mutations continually occur within a species as it propagates and that advantageous mutations, such as increasingly longer necks on giraffes, become more prevalent within a species over time because they help the species adapt to environmental changes. Thus, because Scientist 1 would say that a giraffe's long neck resulted from random mutations and that it is an advantageous trait, choice (G) is correct. Choice H is incorrect because the mutations did not occur "in response to" environmental changes; rather, the mutations were random, and they happened to be advantageous because of the type of environment that the ancestors of modern giraffes lived in, in which access to the leaves of trees was beneficial for their survival.

31. **B**

Difficulty: Low

Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: The crux of the scientists' disagreement is over how evolution occurs—whether through random mutations that become more prevalent as a result of natural selection or through the inheritance of characteristics acquired during the lifetimes of previous generations. Choice (B) is thus correct.

32. **G**
    Difficulty: High

    Category: Thinking Like a Scientist—Evaluating Hypotheses

    Getting to the Answer: Recall that Scientist 2 claims that evolution occurs through the inheritance of acquired characteristics. In order to account for humans possessing nerve endings now that were not present before the discovery of fire, Scientist 2 would have to believe that new nerve endings could be acquired during an individual's lifetime. Choice (G) directly contradicts this idea and would therefore undermine Scientist 2's hypothesis.

33. **A**
    Difficulty: Medium

    Category: Thinking Like a Scientist—Evaluating Hypotheses

Getting to the Answer: Recall that Scientist 1 explains that evolution occurs as a result of random mutations that become more prevalent through natural selection, while Scientist 2 claims that evolution occurs as a result of the inheritance of acquired characteristics. Choices B and C can then be eliminated, because they are explanations that Scientist 2 might offer. And choice D is irrelevant because it would not explain the height increase. Only (A) provides a valid explanation for the increase in average height that is based on the natural selection of adaptive mutations described by Scientist 1.

9. *Passage VI*

34. **G**
Difficulty: Low

Category: Data—Detail & Interpretation

Getting to the Answer: According to the passage, each group consisted of exactly 30 cows, so the greatest risk will correspond to the circumstances of the group with the greatest absolute number of BSE infections. Table 1 shows that Group B had the greatest number of cows infected with BSE. Group B was fed meat from scrapie-infected sheep, so choice (G) is correct.

35. **D**
Difficulty: Medium

Category: Experiments—Design & Methodology

Getting to the Answer: The first paragraph of the passage suggests that the purpose of the experiments was "to determine the mode of transmission of BSE." In Experiment 1, the researchers fed one group of cows meat from scrapie-free sheep and another group meat from scrapie-infected sheep, then later examined the cows for signs of BSE. Thus, the purpose and design of the experiment suggest that it was intended to investigate the hypothesis that ingesting scrapie-infected sheep will cause cows to develop BSE, as in choice (D).

36. **F**
Difficulty: Medium

Category: Experiments—Design & Methodology

Getting to the Answer: As noted in the explanation to the previous question, the general purpose of the two experiments was "to determine the mode of transmission of BSE." Experiment 2, in particular, tested whether injection of scrapie-infected sheep brains directly into cows' brains could cause BSE. Thus, the purpose of Experiment 2 is to investigate whether injection can cause the transmission of BSE, as in choice (F).

37. **B**
Difficulty: Medium

Category: Experiments—Design & Methodology

Getting to the Answer: In Experiments 1 and 2, the researchers examined the brains of cows 18 months (a year and a half) a er the cows were fed sheep meat or were injected with sheep brains. In both experiments, the experimental groups received scrapie-infected sheep while the control groups received scrapie-free sheep. For the experiments to yield useful results, 18 months must be enough time for BSE to develop. Otherwise, there could not be a reasonable expectation of different results for the control and experimental groups—since all the cows were healthy at first, none of them would have had time to develop BSE if it took longer than 18 months. Thus, choice (B) is correct. Choices A and C are incorrect because the passage never discusses whether cows can suffer from scrapie nor whether cows and sheep are susceptible to the same diseases. D is incorrect because it is not relevant to Experiment 2 and because it is subject to investigation in Experiment 1—the researchers don't just assume that cows fed scrapie-free sheep won't develop BSE, but rather they actually make the effort to examine the cows' brains postmortem to see whether they do.

38. **H**
    Difficulty: Low

    Category: Experiments—Design & Methodology

    Getting to the Answer: The experiments discussed in the passage investigate whether scrapie-infected sheep can cause the transmission of BSE to cows. To test whether scrapie-infected goats can do the same, a researcher would merely need to replace the sheep with goats,

but otherwise preserve the conditions of the experiments. This means that the control groups should receive scrapie-free goats rather than scrapie-free sheep and that the experimental groups should receive scrapie-infected goats rather than scrapie-infected sheep. This matches exactly with choice (H).

39. **A**
Difficulty: Medium

Category: Experiments—Design & Methodology

Getting to the Answer: Remember that control groups are used in experiments as standards of comparison. To investigate whether ingesting scrapie-infected sheep causes BSE, it would not be enough simply to look at the effects of eating such infected meat on a group of cows, because there could be some unknown factor at work, other than eating the infected meat, that is responsible for causing BSE. A good experiment will instead involve comparing this experimental group to another group, the control group, which is subject to almost the same conditions as the experimental group, with the only difference being that they are not fed the scrapie-infected sheep. For Experiment 1, this describes the group that is fed scrapie-free sheep, Group A, so choice (A) is correct.

40. **G**
Difficulty: High

Category: Experiments—Synthesizing Data

Getting to the Answer: Statement I concerns cows raised in proximity to scrapie-infected sheep, but this was not studied in either experiment, so statement I could not be a valid conclusion drawn from the experiments' results. This means that choice H can be eliminated. Statement II is also invalid, since the results of Experiment 2 suggest that cows can develop BSE through injection, too—some cases of BSE were discovered in Group D, as seen in Table 1. Choices F and J can thus also be eliminated. Since I and II are both invalid, only statement III can be a valid conclusion and choice (G) must be correct. This can be confirmed by comparing the results for Groups B and D in Table 1. The passage suggests that both groups consisted of 30 cows, but Group B had 12 BSE-infected cows while Group D only had 3.

WRITING TEST

Model Essay

Below is an example of what a high-scoring essay might look like. Notice that the author states her position clearly in the introductory paragraph and supports that position with evidence in the following paragraphs. This essay also uses transitions, some advanced vocabulary, and an effective "hook" to draw in the reader.

Children are often asked, "What do you want to be when you grow up?" Little do they know, whether or not they go to college has a huge impact on their career choices. The issue under discussion is whether or not schools should develop dual curricula to serve both those students who are college bound and those who intend to forego college, instead entering a career directly after high school graduation. The fundamental concern is how to best serve all students, which I believe should be through two curricula working together.

The first point of view supports having all students pursue the same curriculum, one primarily directed at college-bound students. It essentially states that an academic-only curriculum is valuable for all students, regardless of their future plans. It is true that the ability to think critically, have a wide range of content knowledge, and be adept at the skills and techniques required to live a full and productive life are important to all students. A well-rounded person is able to take advantage of many more opportunities than those with limited skills. Furthermore, should a career-bound student change his mind and decide to go to college, he will have the basic requirements for a successful college experience. However, if a student is determined to start his career directly after high school, the college curriculum could be a waste of his time, and he would

be better served by taking courses that prepare him for his career. I am in partial agreement with option one, since a broad, basic education is important for all students. However, it is similarly important to prepare students for their future lives, which may begin immediately after high school.

The second option supports career-readiness education. As stated above, it is important to recognize that some students are set on a embarking on a career after high school rather than on going to college. High school is the place to prepare these students, since it can offer the courses that are most applicable to them. Furthermore, students in danger of dropping out of high school are generally those who are uninterested in or bored by the academic curriculum. Such students would be more engaged and successful if they were able to take classes that fit their goals and interests, and they would be more likely not only to stay in school but also to be well-prepared for their careers. This option purposes a dual curriculum, one for the college bound and one for career readiness, and thus provides the best education for both. On the assumption that non-college-bound students are also taking an adequate number of general education classes, and supplementing them with courses designed to provide them with the skills they need for their careers, these students will now have a solid academic foundation as well as career skills. College-bound students will still have the option to take more academic classes. Thus, I support this option because it provides the best solution for both groups.

Those who agree that students who are not planning on going to college should not be offered career-centered classes are denying the fact that not all students go to college, even if given incentives to do so. This option does not take into consideration the numerous facts that can affect whether or not a student goes to college. Some students cannot afford college fees, even with scholarships; some have a low GPA that would prohibit their acceptance at college; and some do poorly on pre-college tests such as the ACT. Encouraging students to go to college is not enough to ensure that they will. Though it may be true that college teaches how to be productive in the workforce, it is also true that being a fully qualified mechanic or electrician after high school is extremely productive for those who choose these careers. This option is an elitist one that would disregard those for whom college is not a goal, and it is one with which I completely disagree.

It is vital to all students that high schools prepare them for their future, whatever that may be. Those who choose college are well-served by an intensive academic curriculum that gives them a solid foundation for college. On the other hand, for those who choose, or are forced by circumstances, to forego college in favor of immediate entry into the workforce, it is important that, along with a sufficient academic foundation, they also receive training in their intended careers. Thus the second perspective, that of providing both an academic and a career-oriented curriculum, serves the needs of both and is the most effective one for all students.

You can evaluate your essay and the model essay based on the following criteria:

- Is the author's own perspective clearly stated?
- Does the body of the essay assess and analyze each perspective? Is the relevance of each paragraph clear?
- Does the author start a new paragraph for each new idea?
- Is each sentence in a paragraph relevant to the point made in that paragraph?
- Are transitions clear?
- Is the essay easy to read? Is it engaging? Are sentences varied?
- Is vocabulary used effectively?
- Is college-level vocabulary used?