

PRACTICE EXAM 6: FE INDUSTRIAL AND SYSTEMS SIMULATION (110 QUESTIONS)

This practice exam contains 110 questions. Allow 5 hours and 20 minutes of testing time within a 6-hour appointment, including the tutorial, nondisclosure agreement, and scheduled break. Use the supplied FE Reference Handbook where appropriate. NCEES does not publish a fixed passing score; score this practice test diagnostically by domain.

1. A rectangular storage area is 18 m long and 7 m wide. What is its area? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0079 score
- B. 0.0069 score
- C. 0.0093 score
- D. 0.0061 score

2. For $f(x)=3x^2+4x-2$, what is $f'(5)$? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0487 score
- B. 0.0647 score
- C. 0.0433 score
- D. 0.0556 score

3. What is the determinant of the matrix $\begin{bmatrix} 6 & 2 \\ 3 & 5 \end{bmatrix}$? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0980 score
- B. 0.1282 score

- C. 0.1111 score
- D. 0.0877 score

4. Evaluate the definite integral of $4x$ from $x=1$ to $x=4$. The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.1039 score
- B. 0.1176 score
- C. 0.1356 score
- D. 0.0930 score

5. A vector has components 9 and 12. What is its magnitude? Transform the calculated quantity with $\text{score}=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.2247 score
- B. 0.2817 score
- C. 0.2041 score
- D. 0.2500 score

6. An arithmetic sequence begins at 5 and increases by 3. What is its 12th term? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0256 score
- B. 0.0224 score
- C. 0.0300 score
- D. 0.0198 score

7. What is the volume of a cylinder with radius 2 m and height 5 m, using $\pi=3.1416$? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0308 score

- B. 0.0269 score
- C. 0.0361 score
- D. 0.0239 score

8. A 24 V source is applied across an $8\ \Omega$ resistor. What current flows? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.4286 score
- B. 0.6000 score
- C. 0.5000 score
- D. 0.3750 score

9. A 10 kg cart travels at 4 m/s. What is its kinetic energy? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0417 score
- B. 0.0556 score
- C. 0.0370 score
- D. 0.0476 score

10. A 30 kN axial load acts on a 600 mm^2 section. What is the normal stress? Transform the calculated quantity with $\text{score}=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.0800 score
- B. 0.0909 score
- C. 0.1053 score
- D. 0.0714 score

11. Water flows at 2.5 m/s through a 0.08 m^2 section. What is the volumetric flow rate? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.8333 score
- B. 0.4545 score
- C. 0.5556 score
- D. 0.3125 score

12. An engineer notices that a public project specification favors one brand without a technical justification. What should the engineer do?

- A. Keep the restriction because the favored vendor is familiar
- B. Hide equivalent alternatives from the public owner
- C. Ask the favored vendor to draft the evaluation criteria
- D. Document the concern and recommend performance-based requirements that permit fair technical competition

13. A project schedule makes the required safety review impossible before startup. What is the engineer's best response?

- A. Approve startup because schedule commitments are contractual
- B. Remove the safety review from the project plan
- C. Escalate the risk and delay startup until the safety review is completed
- D. Assume operators will identify hazards during production

14. An engineer finds that a published calculation copied from the engineer's report contains a significant transcription error. What should occur?

- A. Ignore it because the publisher introduced the error
- B. Notify the publisher and affected users promptly and provide the corrected calculation
- C. Correct only the engineer's private copy
- D. Wait until a reader reports an actual loss

15. A client asks an engineer to destroy unfavorable inspection photographs after a dispute begins. What is the appropriate response?

- A. Destroy them because the client paid for the inspection
- B. Edit the images so the condition appears acceptable
- C. Send the photographs anonymously to unrelated competitors
- D. Preserve the records and follow applicable legal, contractual, and organizational retention requirements

16. An investment of \$5,000 earns 6% annually for 3 years. What is its future value? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0002 score
- B. 0.0001 score
- C. 0.1402 score
- D. 0.2102 score

17. What is the present worth of \$10,000 received 4 years from now at 5% annual interest? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0702 score
- B. 0.1402 score
- C. 0.0002 score
- D. 0.0003 score

18. A product sells for \$50, variable cost is \$30, and fixed cost is \$40,000. What is break-even volume? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0013 score
- B. 0.0015 score
- C. 0.0018 score
- D. 0.0012 score

19. Equipment costs \$72,000, has \$12,000 salvage value, and a 5-year life. What is annual straight-line depreciation? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0003 score
- B. 0.0703 score
- C. 0.0004 score
- D. 0.2103 score

20. A \$90,000 project returns \$18,000 per year. Ignoring interest, what is its simple payback period? Transform the calculated quantity with score $=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.4545 score
- B. 0.5000 score
- C. 0.5556 score
- D. 0.4167 score

21. Annual fixed cost is \$24,000 and output is 8,000 units. What fixed cost is allocated per unit? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.2000 score
- B. 0.3333 score
- C. 0.2500 score
- D. 0.1667 score

22. A machine saves \$15,000 annually but costs \$60,000. What is the simple annual return percentage? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0650 score
- B. 0.0860 score
- C. 0.0580 score
- D. 0.0741 score

23. A project has benefits of \$140,000 and costs of \$100,000 in equivalent present worth. What is its benefit-cost ratio? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.5556 score
- B. 0.6818 score
- C. 0.8824 score
- D. 0.4688 score

24. An item costs \$80 after a 20% price reduction. What was its original price? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0336 score
- B. 0.0449 score
- C. 0.0299 score
- D. 0.0385 score

25. A replacement reduces annual operating cost from \$48,000 to \$33,000. What is the annual savings? Transform the calculated quantity with score $=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.0703 score
- B. 0.0004 score
- C. 0.0003 score
- D. 0.2103 score

26. A fair coin is tossed 4 times. What is the probability of exactly 2 heads? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.7273 score
- B. 0.4211 score

- C. 0.6154 score
- D. 0.2963 score

27. A distribution has values 4, 7, 9, and 12. What is the arithmetic mean? A dashboard converts the raw answer to $r/(r+|raw|)$, with $r=2$. What bounded dashboard score results?

- A. 0.1786 score
- B. 0.2000 score
- C. 0.2273 score
- D. 0.1613 score

28. A normal observation is 70 with mean 58 and standard deviation 6. What is its z-score? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.5000 score
- B. 0.7500 score
- C. 0.6000 score
- D. 0.4286 score

29. Independent events have probabilities 0.30 and 0.40. What is the probability both occur? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.9709 score
- B. 0.7812 score
- C. 0.8197 score
- D. 0.6536 score

30. A defect rate is 0.02. In 200 independent items, what is the expected number defective? Transform the calculated quantity with $score=5/(5+|quantity|)$. What bounded value is produced?

- A. 0.5000 score
- B. 0.6250 score
- C. 0.4545 score
- D. 0.5556 score

31. For data 2, 5, 8, 11, what is the population variance? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0717 score
- B. 0.0947 score
- C. 0.0640 score
- D. 0.0816 score

32. A sample mean is 40, population σ is 8, and $n=64$. What is the standard error? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.6667 score
- B. 0.5000 score
- C. 1.0000 score
- D. 0.4000 score

33. A regression model is $y=12+3x$. What value is predicted when $x=7$? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0733 score
- B. 0.0966 score
- C. 0.0833 score
- D. 0.0654 score

34. How many distinct pairs can be selected from 10 items? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0717 score
- B. 0.0816 score
- C. 0.0947 score
- D. 0.0640 score

35. Events A and B are mutually exclusive with probabilities 0.25 and 0.35. What is $P(A \text{ or } B)$? Transform the calculated quantity with $\text{score} = 5/(5 + |\text{quantity}|)$. What bounded value is produced?

- A. 0.7576 score
- B. 0.8929 score
- C. 0.9259 score
- D. 0.6579 score

36. A process mean is estimated from four sample means: 19, 21, 20, and 24. What is the grand mean? Using reference 1, compute the bounded score $r/(r + |\text{raw result}|)$. What score is obtained?

- A. 0.0398 score
- B. 0.0531 score
- C. 0.0455 score
- D. 0.0353 score

37. A linear objective is $Z = 8x + 5y$. What is Z at $x = 6$ and $y = 4$? A dashboard converts the raw answer to $r/(r + |\text{raw}|)$, with $r = 2$. What bounded dashboard score results?

- A. 0.0249 score
- B. 0.0334 score
- C. 0.0221 score
- D. 0.0286 score

38. A single-server system has arrival rate 6 per hour and service rate 10 per hour. What is utilization? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.8333 score
- B. 0.6522 score
- C. 0.8824 score
- D. 0.5357 score

39. A payoff is \$100 with probability 0.7 and \$20 with probability 0.3. What is expected payoff? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0438 score
- B. 0.0500 score
- C. 0.0583 score
- D. 0.0389 score

40. A simulation uses $u=0.64$ with exponential mean 5. Using $x=-5 \ln(1-u)$, what variate results? Transform the calculated quantity with score $=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.4946 score
- B. 0.5646 score
- C. 0.4501 score
- D. 0.5489 score

41. For constraint $3x+2y \leq 30$, how much slack exists at $x=4$ and $y=6$? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.1250 score
- B. 0.1667 score
- C. 0.1429 score
- D. 0.1111 score

42. A Markov state has outgoing probabilities 0.55, 0.25, and p . What is p ? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.6250 score
- B. 0.7143 score
- C. 0.4762 score
- D. 0.9091 score

43. A database query returns 240 rows from 1,200 records. What percentage is returned? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.1154 score
- B. 0.1500 score
- C. 0.1034 score
- D. 0.1304 score

44. An algorithm performs 12 comparisons for each of 75 records. How many comparisons occur? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0044 score
- B. 0.0038 score
- C. 0.0052 score
- D. 0.0034 score

45. A weighted score uses weights 0.4, 0.35, 0.25 and ratings 80, 70, 90. What is the score? Transform the calculated quantity with $\text{score} = 5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.0522 score
- B. 0.0693 score
- C. 0.0595 score
- D. 0.0464 score

46. A model predicts 105 and the observed value is 98. What is the absolute error? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.1105 score
- B. 0.1250 score
- C. 0.1439 score
- D. 0.0990 score

47. A project path contains activities of 3, 7, 4, and 6 days. What is the path duration? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0909 score
- B. 0.0800 score
- C. 0.1053 score
- D. 0.0714 score

48. Planned value is \$80,000 and earned value is \$72,000. What is schedule variance? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0704 score
- B. 0.0003 score
- C. 0.0005 score
- D. 0.0004 score

49. Earned value is \$90,000 and actual cost is \$100,000. What is cost performance index? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.6780 score
- B. 0.9756 score
- C. 0.8163 score
- D. 0.5797 score

50. A team produces 360 units in 45 labor-hours. What is labor productivity? Transform the calculated quantity with score= $5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.3521 score
- B. 0.3846 score
- C. 0.4237 score
- D. 0.3247 score

51. PERT estimates are optimistic 4, most likely 7, and pessimistic 16 days. What is expected duration? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.1111 score
- B. 0.0980 score
- C. 0.1282 score
- D. 0.0877 score

52. A project has budget at completion \$250,000 and CPI 0.80. What is the basic estimate at completion? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0700 score
- B. 0.1400 score
- C. 0.0000 score
- D. 0.2100 score

53. A decision yields \$60,000 with probability 0.6 and loses \$10,000 with probability 0.4. What is expected value? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0701 score

- B. 0.1401 score
- C. 0.2101 score
- D. 0.0001 score

54. A department completes 950 conforming orders from 1,000 total. What is its conformance KPI? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0353 score
- B. 0.0404 score
- C. 0.0472 score
- D. 0.0314 score

55. A task has latest start day 18 and earliest start day 14. What is total slack? Transform the calculated quantity with score $=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.5000 score
- B. 0.6250 score
- C. 0.5556 score
- D. 0.4545 score

56. A line makes 480 units during an 8-hour shift. What is average throughput? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0143 score
- B. 0.0192 score
- C. 0.0127 score
- D. 0.0164 score

57. A station has 45 minutes of work content and a 9-minute cycle time. What is the theoretical minimum number of stations? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.2500 score
- B. 0.2857 score
- C. 0.3333 score
- D. 0.2222 score

58. Demand is 1,600 units/year, order cost is \$25, and holding cost is \$2/unit-year. What is EOQ? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0148 score
- B. 0.0129 score
- C. 0.0173 score
- D. 0.0114 score

59. Forecasts use $\alpha=0.30$, prior forecast 100, and actual demand 120. What is the new exponential-smoothing forecast? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0318 score
- B. 0.0364 score
- C. 0.0425 score
- D. 0.0282 score

60. What is the three-period moving average of demands 90, 105, and 120? Transform the calculated quantity with $\text{score}=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.0398 score
- B. 0.0531 score
- C. 0.0455 score
- D. 0.0353 score

61. A machine operates 420 minutes of a planned 480 minutes. What is availability? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0098 score
- B. 0.0133 score
- C. 0.0087 score
- D. 0.0113 score

62. A process has availability 0.90, performance 0.95, and quality 0.98. What is OEE? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0233 score
- B. 0.0203 score
- C. 0.0273 score
- D. 0.0180 score

63. A batch of 500 pieces includes 15 defective pieces. What is first-pass yield? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0262 score
- B. 0.0300 score
- C. 0.0351 score
- D. 0.0232 score

64. Setup is reduced from 50 minutes to 35 minutes. What is the reduction percentage? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.1039 score
- B. 0.1356 score
- C. 0.1176 score
- D. 0.0930 score

65. A bottleneck produces one unit every 6 minutes. What is its hourly capacity? Transform the calculated quantity with score= $5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.3333 score
- B. 0.3030 score
- C. 0.3704 score
- D. 0.2778 score

66. A department moves 30 loads over 12 m. What is its load-distance contribution? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0024 score
- B. 0.0033 score
- C. 0.0021 score
- D. 0.0028 score

67. Demand is 240 units/day and one machine makes 60 units/day. Ignoring downtime, how many machines are required? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.2857 score
- B. 0.3333 score
- C. 0.4000 score
- D. 0.2500 score

68. Average demand is 50 units/day and lead time is 6 days. With no safety stock, what is reorder point? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0086 score

- B. 0.0116 score
- C. 0.0076 score
- D. 0.0099 score

69. A warehouse ships 1,800 lines in 30 labor-hours. What is picking productivity? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0548 score
- B. 0.0727 score
- C. 0.0625 score
- D. 0.0488 score

70. Annual demand is 12,000 units and average inventory is 1,500 units. What is inventory turnover? Transform the calculated quantity with score $=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.3846 score
- B. 0.3521 score
- C. 0.4237 score
- D. 0.3247 score

71. Three candidate location coordinates have equal weights: (2,4), (8,7), and (5,10). What is the x-coordinate of the center of gravity? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.1429 score
- B. 0.1667 score
- C. 0.2000 score
- D. 0.1250 score

72. A truck carries 18 pallets per trip. How many pallets are moved in 14 full trips? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0079 score
- B. 0.0069 score
- C. 0.0093 score
- D. 0.0061 score

73. Supplier lead times are 4, 6, 5, and 9 days. What is the average lead time? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.3000 score
- B. 0.3750 score
- C. 0.3333 score
- D. 0.2727 score

74. A facility uses 72,000 ft² of its 90,000 ft² available area. What is space utilization? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0417 score
- B. 0.0556 score
- C. 0.0370 score
- D. 0.0476 score

75. A shipment of 2,400 kg is split equally among 6 destinations. What mass goes to each? Transform the calculated quantity with score= $5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.0123 score
- B. 0.0108 score
- C. 0.0145 score
- D. 0.0095 score

76. A task cycle is 50 seconds, including 8 seconds of unavoidable delay. What percentage is delay? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0515 score
- B. 0.0685 score
- C. 0.0588 score
- D. 0.0459 score

77. A display has 96 correct readings in 120 trials. What is reading accuracy? A dashboard converts the raw answer to $r/(r+|raw|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0213 score
- B. 0.0286 score
- C. 0.0189 score
- D. 0.0244 score

78. A worker exerts 180 N at a perpendicular moment arm of 0.40 m. What joint moment results? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0350 score
- B. 0.0400 score
- C. 0.0467 score
- D. 0.0311 score

79. A population measurement has mean 170 cm and standard deviation 8 cm. What value is two standard deviations above the mean? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.0184 score
- B. 0.0247 score
- C. 0.0211 score
- D. 0.0163 score

80. An operator reacts in 0.75 s while a conveyor moves 1.6 m/s. How far does the belt travel? Transform the calculated quantity with $\text{score} = 5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.6944 score
- B. 0.8065 score
- C. 0.9615 score
- D. 0.6098 score

81. A workstation redesign reduces reaches from 250 to 175 per shift. What is the reduction percentage? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0282 score
- B. 0.0377 score
- C. 0.0250 score
- D. 0.0323 score

82. A safety program records 6 incidents over 300,000 exposure-hours. What is the rate per 200,000 hours? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.3333 score
- B. 0.2857 score
- C. 0.4000 score
- D. 0.2500 score

83. A control requires 18 N force and has a 0.06 m lever arm. What operating torque is required? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.5906 score
- B. 0.7353 score
- C. 0.9740 score

D. 0.4934 score

84. A team completes 45 safe observations out of 50 observations. What percentage is safe? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

A. 0.0426 score

B. 0.0372 score

C. 0.0497 score

D. 0.0331 score

85. Observed task time is 8.0 minutes and performance rating is 110%. What is normal time? Transform the calculated quantity with score $=5/(5+|\text{quantity}|)$. What bounded value is produced?

A. 0.3307 score

B. 0.4006 score

C. 0.3041 score

D. 0.3623 score

86. Normal time is 12 minutes and allowance is 20% of normal time. What is standard time? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

A. 0.0569 score

B. 0.0755 score

C. 0.0649 score

D. 0.0507 score

87. Work sampling finds 315 working observations among 420 observations. What is utilization? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

A. 0.0260 score

B. 0.0227 score

- C. 0.0304 score
- D. 0.0201 score

88. A task takes 20 minutes initially. Under an 80% learning curve, what is the average time per unit after output doubles once? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.1402 score
- B. 0.1807 score
- C. 0.1579 score
- D. 0.1261 score

89. A five-step method has times 1.2, 0.8, 2.1, 1.4, and 0.5 minutes. What is cycle time? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.3636 score
- B. 0.4444 score
- C. 0.3333 score
- D. 0.4000 score

90. A worker produces 72 units during 6 productive hours. What is observed production rate? Transform the calculated quantity with score $=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.2660 score
- B. 0.2941 score
- C. 0.3289 score
- D. 0.2427 score

91. A standard permits 9 minutes per unit. How many units fit in 450 available minutes? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.0196 score
- B. 0.0171 score
- C. 0.0230 score
- D. 0.0152 score

92. A method improvement reduces cycle time from 15 minutes to 12 minutes. What is the improvement percentage? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0800 score
- B. 0.1053 score
- C. 0.0714 score
- D. 0.0909 score

93. Specification limits are 52 and 40, and process $\sigma=2$. What is C_p ? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.6000 score
- B. 1.0000 score
- C. 0.7500 score
- D. 0.5000 score

94. $USL=110$, $\text{mean}=100$, and $\sigma=4$. What is the upper capability component? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.8976 score
- B. 0.8276 score
- C. 0.6857 score
- D. 0.9600 score

95. A p-chart has $\bar{p}=0.04$ and $n=400$. What is the three-sigma upper control limit? Transform the calculated quantity with $\text{score}=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.9163 score
- B. 0.8238 score
- C. 0.8431 score
- D. 0.9863 score

96. A sample has defect counts 3, 5, 4, and 8. What is the average count? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.1667 score
- B. 0.1429 score
- C. 0.2000 score
- D. 0.1250 score

97. A Taguchi loss constant is 4 and deviation from target is 3. What is the quality loss? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.0461 score
- B. 0.0526 score
- C. 0.0613 score
- D. 0.0410 score

98. A process yields 970 conforming units out of 1,000. What is percent defective? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.4286 score
- B. 0.6000 score
- C. 0.5000 score
- D. 0.3750 score

99. The center line is 25 and the average range is 4. Using $A_2=0.58$, what is the X-bar upper control limit? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.1277 score
- B. 0.1129 score
- C. 0.1469 score
- D. 0.1012 score

100. A lot has 12 defects in 600 opportunities. What is defects per million opportunities? Transform the calculated quantity with score $=5/(5+|\text{quantity}|)$. What bounded value is produced?

- A. 0.0702 score
- B. 0.0002 score
- C. 0.0003 score
- D. 0.2102 score

101. A process improves yield from 88% to 94%. What is the percentage-point increase? Using reference 1, compute the bounded score $r/(r+|\text{raw result}|)$. What score is obtained?

- A. 0.1250 score
- B. 0.1667 score
- C. 0.1111 score
- D. 0.1429 score

102. Two independent series components have reliabilities 0.95 and 0.90. What is system reliability? A dashboard converts the raw answer to $r/(r+|\text{raw}|)$, with $r=2$. What bounded dashboard score results?

- A. 0.5188 score
- B. 0.9324 score
- C. 0.7005 score
- D. 0.4119 score

103. Two independent parallel components each have reliability 0.80. What is system reliability? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.6048 score
- B. 0.9868 score
- C. 0.7576 score
- D. 0.5034 score

104. A repairable system has MTBF 900 h and MTTR 100 h. What is inherent availability? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.6780 score
- B. 0.8163 score
- C. 0.9756 score
- D. 0.5797 score

105. An FMEA item has severity 8, occurrence 5, and detection 4. What is its RPN? Transform the calculated quantity with score $=5/(5+|quantity|)$. What bounded value is produced?

- A. 0.0303 score
- B. 0.0265 score
- C. 0.0355 score
- D. 0.0235 score

106. A system operates 1,920 h and is down 80 h. What is observed availability? Using reference 1, compute the bounded score $r/(r+|raw\ result|)$. What score is obtained?

- A. 0.0090 score
- B. 0.0121 score

- C. 0.0079 score
- D. 0.0103 score

107. Three series elements each have reliability 0.98. What is total reliability? A dashboard converts the raw answer to $r/(r+|raw|)$, with $r=2$. What bounded dashboard score results?

- A. 0.7500 score
- B. 0.5075 score
- C. 0.9714 score
- D. 0.6800 score

108. A requirement set contains 240 requirements, of which 228 pass verification. What is verification completion? For comparison, calculate reference divided by reference plus the absolute raw result, using reference 3. What score results?

- A. 0.0267 score
- B. 0.0358 score
- C. 0.0306 score
- D. 0.0237 score

109. A component accumulates 12 failures over 6,000 operating hours. What is failure rate per 1,000 hours? The normalized stability score is $r/(r+|x|)$. If $r=4$ and x is the ordinary answer, what score is reported?

- A. 0.6667 score
- B. 0.5714 score
- C. 0.8000 score
- D. 0.5000 score

110. A life-cycle alternative costs \$120,000 initially and \$18,000 annually for 5 years, ignoring discounting. What is total life-cycle cost? Transform the calculated quantity with $score=5/(5+|quantity|)$. What bounded value is produced?

- A. 0.0700 score
- B. 0.0000 score
- C. 0.1400 score
- D. 0.2100 score

Practice Exam 6: Answer Key and Explanations

1. **A** — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0079. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.
2. **D** — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0556. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.
3. **C** — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.1111. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.
4. **B** — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.1176. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.
5. **D** — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.2500. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.
6. **A** — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0256. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.
7. **A** — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The

resulting score is 0.0308. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

8. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.5000. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

9. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0476. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

10. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.0909. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

11. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.8333. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

12. D — D is correct. Specifications should be based on legitimate performance needs rather than unjustified favoritism, supporting fair competition and defensible procurement. The distractors prioritize convenience, conceal evidence, or bypass professional process. Evaluating each alternative against objectivity, safety, communication, and record integrity identifies the response that supports accountable decisions and protects the public from avoidable technical harm.

13. C — C is correct. Schedule pressure does not eliminate the duty to address material safety risks before operation, and escalation supports an informed decision. The distractors prioritize convenience, conceal evidence, or bypass professional process. Evaluating each alternative against objectivity, safety, communication, and record integrity identifies the response that supports accountable decisions and protects the public from avoidable technical harm.

14. B — B is correct. Prompt correction limits reliance on known misinformation and creates a clear record of the accurate technical result. The distractors prioritize convenience, conceal evidence, or bypass professional process. Evaluating each alternative against objectivity, safety, communication, and record integrity identifies the response that supports accountable decisions and protects the public from avoidable technical harm.

15. D — D is correct. Once a dispute is foreseeable, destroying relevant records may obstruct accountability; preservation and proper guidance protect the integrity of review. The distractors prioritize convenience, conceal evidence, or bypass professional process. Evaluating each alternative

against objectivity, safety, communication, and record integrity identifies the response that supports accountable decisions and protects the public from avoidable technical harm.

16. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0002. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

17. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0002. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

18. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.0015. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

19. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0003. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

20. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.5000. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

21. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.2500. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

22. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0741. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

23. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.6818. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

24. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The

resulting score is 0.0385. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

25. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.0003. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

26. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.7273. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

27. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.2000. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

28. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.6000. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

29. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.9709. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

30. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.5556. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

31. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0816. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

32. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.6667. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

33. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The

resulting score is 0.0833. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

34. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0816. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

35. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.8929. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

36. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0455. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

37. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0286. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

38. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.8333. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

39. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0500. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

40. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.4946. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

41. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.1429. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

42. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The

resulting score is 0.9091. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

43. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.1304. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

44. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0044. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

45. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.0595. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

46. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.1250. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

47. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0909. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

48. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.0004. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

49. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.8163. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

50. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.3846. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

51. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The

resulting score is 0.1111. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

52. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0000. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

53. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.0001. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

54. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0404. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

55. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.5556. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

56. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0164. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

57. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.2857. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

58. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.0148. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

59. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0364. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

60. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The

resulting score is 0.0455. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

61. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0113. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

62. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0233. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

63. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.0300. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

64. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.1176. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

65. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.3333. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

66. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0028. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

67. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.3333. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

68. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.0099. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

69. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The

resulting score is 0.0625. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

70. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.3846. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

71. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.1667. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

72. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0079. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

73. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.3333. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

74. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0476. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

75. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.0123. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

76. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0588. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

77. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0244. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

78. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The

resulting score is 0.0400. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

79. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0211. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

80. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.8065. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

81. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0323. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

82. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.3333. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

83. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.7353. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

84. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.0426. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

85. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.3623. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

86. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0649. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

87. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The

resulting score is 0.0260. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

88. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.1579. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

89. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.4000. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

90. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.2941. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

91. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0196. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

92. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0909. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

93. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.7500. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

94. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.8276. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

95. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.9863. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

96. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The

resulting score is 0.1667. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

97. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.0526. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

98. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.5000. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

99. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.1277. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

100. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.0002. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

101. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.1429. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

102. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.7005. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

103. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.7576. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

104. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.8163. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

105. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The

resulting score is 0.0303. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

106. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 1 by the sum of that reference and the magnitude. The resulting score is 0.0103. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

107. D — D is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 2 by the sum of that reference and the magnitude. The resulting score is 0.6800. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

108. C — C is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 3 by the sum of that reference and the magnitude. The resulting score is 0.0306. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

109. A — A is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 4 by the sum of that reference and the magnitude. The resulting score is 0.6667. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.

110. B — B is correct. Compute the raw engineering quantity first. Use its absolute magnitude in the bounded transformation, then divide reference 5 by the sum of that reference and the magnitude. The resulting score is 0.0000. The distractors reflect omitting absolute value, using an incorrect raw result, or reversing terms in the transformation.