

PRACTICE EXAM 19: 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 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4966 fit
- B. 0.4954 fit
- C. 0.4961 fit
- D. 0.4970 fit

2. For $f(x)=3x^2+4x-2$, what is $f'(5)$? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4595 fit
- B. 0.4644 fit
- C. 0.4530 fit
- D. 0.4682 fit

3. What is the determinant of the matrix $[[6,2],[3,5]]$? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.4107 fit
- B. 0.4000 fit

- C. 0.3864 fit
- D. 0.4194 fit

4. Evaluate the definite integral of $4x$ from $x=1$ to $x=4$. The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.3876 fit
- B. 0.3592 fit
- C. 0.3750 fit
- D. 0.3980 fit

5. A vector has components 9 and 12. What is its magnitude? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.2674 fit
- B. 0.2297 fit
- C. 0.2826 fit
- D. 0.2500 fit

6. An arithmetic sequence begins at 5 and increases by 3. What is its 12th term? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4872 fit
- B. 0.4888 fit
- C. 0.4850 fit
- D. 0.4901 fit

7. What is the volume of a cylinder with radius 2 m and height 5 m, using $\pi=3.1416$? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4801 fit
- B. 0.4734 fit
- C. 0.4772 fit
- D. 0.4823 fit

8. A 24 V source is applied across an $8\ \Omega$ resistor. What current flows? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.2000 fit
- B. 0.1250 fit
- C. 0.2273 fit
- D. 0.1667 fit

9. A 10 kg cart travels at 4 m/s. What is its kinetic energy? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4510 fit
- B. 0.4444 fit
- C. 0.4359 fit
- D. 0.4561 fit

10. A 30 kN axial load acts on a 600 mm^2 section. What is the normal stress? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.3846 fit
- B. 0.3966 fit
- C. 0.3696 fit
- D. 0.4062 fit

11. Water flows at 2.5 m/s through a 0.08 m^2 section. What is the volumetric flow rate? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.2727 fit
- B. 0.2222 fit
- C. 0.3438 fit
- D. 0.0833 fit

12. A client requests deletion of unfavorable but valid test observations. What should the engineer do?

- A. Retain valid observations and explain their effect on the conclusion
- B. Delete them because the client owns the report
- C. Replace them with favorable simulated observations
- D. Hide them in an inaccessible working folder

13. An engineer receives a financial interest in a supplier under evaluation. What is appropriate?

- A. Keep the interest secret during evaluation
- B. Increase the supplier score without explanation
- C. Disclose the interest and withdraw or follow an approved mitigation
- D. Ask the supplier to conceal the relationship

14. A dashboard displays a forecast without its confidence interval. What should the engineer recommend?

- A. Remove every reference to forecast uncertainty
- B. Display uncertainty alongside the forecast so users can interpret it
- C. Describe the point estimate as guaranteed
- D. Widen the axis to conceal variability

15. A maintenance model was calibrated using one facility only. How should broader use be handled?

- A. Validate transferability before applying it to materially different facilities
- B. Assume calibration automatically applies everywhere

- C. Remove the facility description from documentation
- D. Guarantee identical performance at every location

16. An investment of \$5,000 earns 6% annually for 3 years. What is its future value? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4399 fit
- B. 0.4999 fit
- C. 0.3799 fit
- D. 0.3199 fit

17. What is the present worth of \$10,000 received 4 years from now at 5% annual interest? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4398 fit
- B. 0.3798 fit
- C. 0.3198 fit
- D. 0.4998 fit

18. A product sells for \$50, variable cost is \$30, and fixed cost is \$40,000. What is break-even volume? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.4987 fit
- B. 0.4982 fit
- C. 0.4985 fit
- D. 0.4988 fit

19. Equipment costs \$72,000, has \$12,000 salvage value, and a 5-year life. What is annual straight-line depreciation? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4396 fit
- B. 0.4996 fit
- C. 0.4995 fit
- D. 0.4997 fit

20. A \$90,000 project returns \$18,000 per year. Ignoring interest, what is its simple payback period? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.1429 fit
- B. 0.1053 fit
- C. 0.1250 fit
- D. 0.1591 fit

21. Annual fixed cost is \$24,000 and output is 8,000 units. What fixed cost is allocated per unit? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4000 fit
- B. 0.3333 fit
- C. 0.4167 fit
- D. 0.3750 fit

22. A machine saves \$15,000 annually but costs \$60,000. What is the simple annual return percentage? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4464 fit
- B. 0.4528 fit
- C. 0.4381 fit
- D. 0.4577 fit

23. A project has benefits of \$140,000 and costs of \$100,000 in equivalent present worth. What is its benefit-cost ratio? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.1429 fit
- B. 0.0946 fit
- C. 0.0312 fit
- D. 0.1809 fit

24. An item costs \$80 after a 20% price reduction. What was its original price? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4600 fit
- B. 0.4474 fit
- C. 0.4643 fit
- D. 0.4545 fit

25. A replacement reduces annual operating cost from \$48,000 to \$33,000. What is the annual savings? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.4995 fit
- B. 0.4996 fit
- C. 0.4994 fit
- D. 0.3195 fit

26. A fair coin is tossed 4 times. What is the probability of exactly 2 heads? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.2895 fit
- B. 0.1923 fit
- C. 0.1364 fit
- D. 0.3519 fit

27. A distribution has values 4, 7, 9, and 12. What is the arithmetic mean? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.3770 fit
- B. 0.3469 fit
- C. 0.3636 fit
- D. 0.3881 fit

28. A normal observation is 70 with mean 58 and standard deviation 6. What is its z-score? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.1250 fit
- B. 0.1667 fit
- C. 0.0714 fit
- D. 0.2000 fit

29. Independent events have probabilities 0.30 and 0.40. What is the probability both occur? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.0504 fit
- B. 0.0059 fit
- C. 0.0404 fit
- D. 0.0875 fit

30. A defect rate is 0.02. In 200 independent items, what is the expected number defective? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.1250 fit
- B. 0.0833 fit
- C. 0.1429 fit

D. 0.1053 fit

31. For data 2, 5, 8, 11, what is the population variance? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

A. 0.4641 fit

B. 0.4527 fit

C. 0.4680 fit

D. 0.4592 fit

32. A sample mean is 40, population σ is 8, and $n=64$. What is the standard error? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

A. 0.2000 fit

B. 0.0000 fit

C. 0.1250 fit

D. 0.2500 fit

33. A regression model is $y=12+3x$. What value is predicted when $x=7$? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

A. 0.4317 fit

B. 0.4231 fit

C. 0.4119 fit

D. 0.4387 fit

34. How many distinct pairs can be selected from 10 items? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

A. 0.4091 fit

B. 0.4190 fit

- C. 0.3964 fit
- D. 0.4270 fit

35. Events A and B are mutually exclusive with probabilities 0.25 and 0.35. What is $P(A \text{ or } B)$? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.0482 fit
- B. 0.0192 fit
- C. 0.0130 fit
- D. 0.0739 fit

36. A process mean is estimated from four sample means: 19, 21, 20, and 24. What is the grand mean? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4801 fit
- B. 0.4735 fit
- C. 0.4823 fit
- D. 0.4773 fit

37. A linear objective is $Z=8x+5y$. What is Z at $x=6$ and $y=4$? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4815 fit
- B. 0.4753 fit
- C. 0.4789 fit
- D. 0.4836 fit

38. A single-server system has arrival rate 6 per hour and service rate 10 per hour. What is utilization? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.0455 fit
- B. 0.1053 fit
- C. 0.0312 fit
- D. 0.1512 fit

39. A payoff is \$100 with probability 0.7 and \$20 with probability 0.3. What is expected payoff? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4487 fit
- B. 0.4419 fit
- C. 0.4330 fit
- D. 0.4540 fit

40. A simulation uses $u=0.64$ with exponential mean 5. Using $x=-5 \ln(1-u)$, what variate results? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.1270 fit
- B. 0.0670 fit
- C. 0.1447 fit
- D. 0.1075 fit

41. For constraint $3x+2y \leq 30$, how much slack exists at $x=4$ and $y=6$? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4375 fit
- B. 0.4167 fit
- C. 0.4444 fit
- D. 0.4286 fit

42. A Markov state has outgoing probabilities 0.55, 0.25, and p . What is p ? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.1429 fit
- B. 0.1053 fit
- C. 0.0312 fit
- D. 0.2115 fit

43. A database query returns 240 rows from 1,200 records. What percentage is returned? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.3966 fit
- B. 0.3696 fit
- C. 0.4062 fit
- D. 0.3846 fit

44. An algorithm performs 12 comparisons for each of 75 records. How many comparisons occur? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4952 fit
- B. 0.4945 fit
- C. 0.4935 fit
- D. 0.4958 fit

45. A weighted score uses weights 0.4, 0.35, 0.25 and ratings 80, 70, 90. What is the score? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.4291 fit
- B. 0.4087 fit
- C. 0.4202 fit
- D. 0.4363 fit

46. A model predicts 105 and the observed value is 98. What is the absolute error? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4375 fit
- B. 0.4448 fit
- C. 0.4281 fit
- D. 0.4505 fit

47. A project path contains activities of 3, 7, 4, and 6 days. What is the path duration? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4348 fit
- B. 0.4423 fit
- C. 0.4250 fit
- D. 0.4483 fit

48. Planned value is \$80,000 and earned value is \$72,000. What is schedule variance? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.4396 fit
- B. 0.4997 fit
- C. 0.4995 fit
- D. 0.4996 fit

49. Earned value is \$90,000 and actual cost is \$100,000. What is cost performance index? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.0798 fit
- B. 0.0050 fit
- C. 0.0413 fit
- D. 0.1124 fit

50. A team produces 360 units in 45 labor-hours. What is labor productivity? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.1901 fit
- B. 0.1739 fit
- C. 0.1560 fit
- D. 0.2047 fit

51. PERT estimates are optimistic 4, most likely 7, and pessimistic 16 days. What is expected duration? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4510 fit
- B. 0.4359 fit
- C. 0.4561 fit
- D. 0.4444 fit

52. A project has budget at completion \$250,000 and CPI 0.80. What is the basic estimate at completion? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4400 fit
- B. 0.3800 fit
- C. 0.5000 fit
- D. 0.3200 fit

53. A decision yields \$60,000 with probability 0.6 and loses \$10,000 with probability 0.4. What is expected value? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.4999 fit
- B. 0.4399 fit
- C. 0.3799 fit
- D. 0.3199 fit

54. A department completes 950 conforming orders from 1,000 total. What is its conformance KPI? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4581 fit
- B. 0.4524 fit
- C. 0.4449 fit
- D. 0.4625 fit

55. A task has latest start day 18 and earliest start day 14. What is total slack? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.1250 fit
- B. 0.0833 fit
- C. 0.1053 fit
- D. 0.1429 fit

56. A line makes 480 units during an 8-hour shift. What is average throughput? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4929 fit
- B. 0.4904 fit
- C. 0.4937 fit
- D. 0.4918 fit

57. A station has 45 minutes of work content and a 9-minute cycle time. What is the theoretical minimum number of stations? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.3125 fit
- B. 0.3333 fit

- C. 0.2857 fit
- D. 0.3500 fit

58. Demand is 1,600 units/year, order cost is \$25, and holding cost is \$2/unit-year. What is EOQ? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.4873 fit
- B. 0.4854 fit
- C. 0.4830 fit
- D. 0.4887 fit

59. Forecasts use $\alpha=0.30$, prior forecast 100, and actual demand 120. What is the new exponential-smoothing forecast? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4621 fit
- B. 0.4500 fit
- C. 0.4662 fit
- D. 0.4569 fit

60. What is the three-period moving average of demands 90, 105, and 120? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.4375 fit
- B. 0.4448 fit
- C. 0.4281 fit
- D. 0.4505 fit

61. A machine operates 420 minutes of a planned 480 minutes. What is availability? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4951 fit

- B. 0.4934 fit
- C. 0.4944 fit
- D. 0.4956 fit

62. A process has availability 0.90, performance 0.95, and quality 0.98. What is OEE? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4849 fit
- B. 0.4827 fit
- C. 0.4798 fit
- D. 0.4866 fit

63. A batch of 500 pieces includes 15 defective pieces. What is first-pass yield? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.4709 fit
- B. 0.4745 fit
- C. 0.4661 fit
- D. 0.4773 fit

64. Setup is reduced from 50 minutes to 35 minutes. What is the reduction percentage? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.3876 fit
- B. 0.3592 fit
- C. 0.3980 fit
- D. 0.3750 fit

65. A bottleneck produces one unit every 6 minutes. What is its hourly capacity? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.2170 fit
- B. 0.2000 fit
- C. 0.1809 fit
- D. 0.2321 fit

66. A department moves 30 loads over 12 m. What is its load-distance contribution? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4988 fit
- B. 0.4984 fit
- C. 0.4986 fit
- D. 0.4989 fit

67. Demand is 240 units/day and one machine makes 60 units/day. Ignoring downtime, how many machines are required? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.3125 fit
- B. 0.2500 fit
- C. 0.3333 fit
- D. 0.2857 fit

68. Average demand is 50 units/day and lead time is 6 days. With no safety stock, what is reorder point? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.4915 fit
- B. 0.4902 fit
- C. 0.4885 fit
- D. 0.4924 fit

69. A warehouse ships 1,800 lines in 30 labor-hours. What is picking productivity? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4286 fit
- B. 0.4367 fit
- C. 0.4180 fit
- D. 0.4432 fit

70. Annual demand is 12,000 units and average inventory is 1,500 units. What is inventory turnover? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.1901 fit
- B. 0.1560 fit
- C. 0.1739 fit
- D. 0.2047 fit

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 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4286 fit
- B. 0.4167 fit
- C. 0.4000 fit
- D. 0.4375 fit

72. A truck carries 18 pallets per trip. How many pallets are moved in 14 full trips? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4941 fit
- B. 0.4949 fit
- C. 0.4931 fit
- D. 0.4955 fit

73. Supplier lead times are 4, 6, 5, and 9 days. What is the average lead time? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.2692 fit
- B. 0.2273 fit
- C. 0.2857 fit
- D. 0.2500 fit

74. A facility uses 72,000 ft² of its 90,000 ft² available area. What is space utilization? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4510 fit
- B. 0.4359 fit
- C. 0.4444 fit
- D. 0.4561 fit

75. A shipment of 2,400 kg is split equally among 6 destinations. What mass goes to each? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.4842 fit
- B. 0.4819 fit
- C. 0.4789 fit
- D. 0.4860 fit

76. A task cycle is 50 seconds, including 8 seconds of unavoidable delay. What percentage is delay? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4742 fit
- B. 0.4658 fit
- C. 0.4706 fit
- D. 0.4771 fit

77. A display has 96 correct readings in 120 trials. What is reading accuracy? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4842 fit
- B. 0.4789 fit
- C. 0.4860 fit
- D. 0.4819 fit

78. A worker exerts 180 N at a perpendicular moment arm of 0.40 m. What joint moment results? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.4615 fit
- B. 0.4662 fit
- C. 0.4554 fit
- D. 0.4699 fit

79. A population measurement has mean 170 cm and standard deviation 8 cm. What value is two standard deviations above the mean? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4745 fit
- B. 0.4777 fit
- C. 0.4703 fit
- D. 0.4801 fit

80. An operator reacts in 0.75 s while a conveyor moves 1.6 m/s. How far does the belt travel? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.0640 fit
- B. 0.0066 fit

- C. 0.0879 fit
- D. 0.0370 fit

81. A workstation redesign reduces reaches from 250 to 175 per shift. What is the reduction percentage? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4859 fit
- B. 0.4839 fit
- C. 0.4811 fit
- D. 0.4875 fit

82. A safety program records 6 incidents over 300,000 exposure-hours. What is the rate per 200,000 hours? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.3125 fit
- B. 0.2500 fit
- C. 0.2857 fit
- D. 0.3333 fit

83. A control requires 18 N force and has a 0.06 m lever arm. What operating torque is required? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.1287 fit
- B. 0.0066 fit
- C. 0.1696 fit
- D. 0.0763 fit

84. A team completes 45 safe observations out of 50 observations. What percentage is safe? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.4559 fit
- B. 0.4500 fit
- C. 0.4422 fit
- D. 0.4606 fit

85. Observed task time is 8.0 minutes and performance rating is 110%. What is normal time? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.2014 fit
- B. 0.1664 fit
- C. 0.1849 fit
- D. 0.2163 fit

86. Normal time is 12 minutes and allowance is 20% of normal time. What is standard time? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4675 fit
- B. 0.4715 fit
- C. 0.4622 fit
- D. 0.4746 fit

87. Work sampling finds 315 working observations among 420 observations. What is utilization? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4832 fit
- B. 0.4775 fit
- C. 0.4808 fit
- D. 0.4851 fit

88. A task takes 20 minutes initially. Under an 80% learning curve, what is the average time per unit after output doubles once? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.3636 fit
- B. 0.3770 fit
- C. 0.3469 fit
- D. 0.3881 fit

89. A five-step method has times 1.2, 0.8, 2.1, 1.4, and 0.5 minutes. What is cycle time? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.2059 fit
- B. 0.1875 fit
- C. 0.1667 fit
- D. 0.2222 fit

90. A worker produces 72 units during 6 productive hours. What is observed production rate? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.2396 fit
- B. 0.2024 fit
- C. 0.2549 fit
- D. 0.2222 fit

91. A standard permits 9 minutes per unit. How many units fit in 450 available minutes? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4915 fit
- B. 0.4885 fit
- C. 0.4924 fit
- D. 0.4902 fit

92. A method improvement reduces cycle time from 15 minutes to 12 minutes. What is the improvement percentage? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4348 fit
- B. 0.4423 fit
- C. 0.4250 fit
- D. 0.4483 fit

93. Specification limits are 52 and 40, and process $\sigma=2$. What is C_p ? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.1250 fit
- B. 0.0714 fit
- C. 0.0000 fit
- D. 0.1667 fit

94. $USL=110$, $mean=100$, and $\sigma=4$. What is the upper capability component? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.0985 fit
- B. 0.0775 fit
- C. 0.0385 fit
- D. 0.0082 fit

95. A p-chart has $\bar{p}=0.04$ and $n=400$. What is the three-sigma upper control limit? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.0623 fit
- B. 0.0333 fit

- C. 0.0292 fit
- D. 0.0023 fit

96. A sample has defect counts 3, 5, 4, and 8. What is the average count? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4167 fit
- B. 0.4286 fit
- C. 0.4000 fit
- D. 0.4375 fit

97. A Taguchi loss constant is 4 and deviation from target is 3. What is the quality loss? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.4662 fit
- B. 0.4615 fit
- C. 0.4554 fit
- D. 0.4699 fit

98. A process yields 970 conforming units out of 1,000. What is percent defective? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.2000 fit
- B. 0.1667 fit
- C. 0.1250 fit
- D. 0.2273 fit

99. The center line is 25 and the average range is 4. Using $A_2=0.58$, what is the $\bar{X}$ -bar upper control limit? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.3793 fit
- B. 0.3495 fit
- C. 0.3660 fit
- D. 0.3901 fit

100. A lot has 12 defects in 600 opportunities. What is defects per million opportunities? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.4997 fit
- B. 0.3796 fit
- C. 0.3196 fit
- D. 0.4996 fit

101. A process improves yield from 88% to 94%. What is the percentage-point increase? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4375 fit
- B. 0.4167 fit
- C. 0.4286 fit
- D. 0.4444 fit

102. Two independent series components have reliabilities 0.95 and 0.90. What is system reliability? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.1109 fit
- B. 0.1910 fit
- C. 0.0231 fit
- D. 0.2438 fit

103. Two independent parallel components each have reliability 0.80. What is system reliability? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.1231 fit
- B. 0.0033 fit
- C. 0.0690 fit
- D. 0.1652 fit

104. A repairable system has MTBF 900 h and MTTR 100 h. What is inherent availability? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.0798 fit
- B. 0.0050 fit
- C. 0.1124 fit
- D. 0.0413 fit

105. An FMEA item has severity 8, occurrence 5, and detection 4. What is its RPN? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.4571 fit
- B. 0.4623 fit
- C. 0.4503 fit
- D. 0.4664 fit

106. A system operates 1,920 h and is down 80 h. What is observed availability? Using reference 2, compute the compressed-share index $m/(2m+r)$, where m is the raw magnitude. What index results?

- A. 0.4955 fit
- B. 0.4948 fit
- C. 0.4939 fit
- D. 0.4960 fit

107. Three series elements each have reliability 0.98. What is total reliability? A compressed share equals magnitude divided by twice magnitude plus reference. Use reference 6. What value is obtained?

- A. 0.0594 fit
- B. 0.1964 fit
- C. 0.1194 fit
- D. 0.0096 fit

108. A requirement set contains 240 requirements, of which 228 pass verification. What is verification completion? Transform the raw answer with $|x|/(2|x|+12)$. What dimensionless compressed share is reported?

- A. 0.4703 fit
- B. 0.4740 fit
- C. 0.4654 fit
- D. 0.4768 fit

109. A component accumulates 12 failures over 6,000 operating hours. What is failure rate per 1,000 hours? The reporting metric is $m/(2m+r)$, with $r=20$. What bounded share results?

- A. 0.1154 fit
- B. 0.0833 fit
- C. 0.0455 fit
- D. 0.1429 fit

110. A life-cycle alternative costs \$120,000 initially and \$18,000 annually for 5 years, ignoring discounting. What is total life-cycle cost? For reference 30, divide the raw magnitude by twice magnitude plus the reference. What value results?

- A. 0.4400 fit
- B. 0.3800 fit
- C. 0.3200 fit

D. 0.5000 fit

Practice Exam 19: Answer Key and Explanations

1. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4961. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

2. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4595. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

3. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4000. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

4. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.3750. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

5. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.2500. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

6. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4872. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

7. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4772. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

8. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.1667. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

9. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4444. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

10. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.3846. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

11. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.0833. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

12. A — A is correct. Valid test evidence should remain in the analysis because selective deletion would bias the reported conclusion. The distractors delete valid evidence, conceal a financial conflict, hide forecast uncertainty, or assume unsupported transferability. Complete observations, conflict disclosure, visible uncertainty, and external validation preserve professional integrity and provide decision makers with dependable results.

13. C — C is correct. A financial interest creates a conflict that requires disclosure and an effective impartiality safeguard. The distractors delete valid evidence, conceal a financial conflict, hide forecast uncertainty, or assume unsupported transferability. Complete observations, conflict disclosure, visible uncertainty, and external validation preserve professional integrity and provide decision makers with dependable results.

14. B — B is correct. A point forecast alone can overstate precision, whereas visible uncertainty supports informed interpretation. The distractors delete valid evidence, conceal a financial conflict, hide forecast uncertainty, or assume unsupported transferability. Complete observations, conflict disclosure, visible uncertainty, and external validation preserve professional integrity and provide decision makers with dependable results.

15. A — A is correct. Calibration at one facility does not establish performance under different processes, equipment, or operating conditions. The distractors delete valid evidence, conceal a financial conflict, hide forecast uncertainty, or assume unsupported transferability. Complete observations, conflict disclosure, visible uncertainty, and external validation preserve professional integrity and provide decision makers with dependable results.

16. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4999. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

- 17. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4998. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 18. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4985. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 19. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4996. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 20. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.1250. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 21. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.3750. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 22. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4464. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 23. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.0946. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 24. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4545. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 25. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.4995. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

- 26. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.1364. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 27. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.3636. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 28. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.1250. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 29. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.0059. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 30. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.1053. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 31. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4592. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 32. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.1250. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 33. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4231. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 34. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4091. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

- 35. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.0192. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 36. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4773. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 37. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4789. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 38. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.0455. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 39. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4419. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 40. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.1270. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 41. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4286. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 42. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.0312. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 43. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.3846. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

- 44. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4945. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 45. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.4202. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 46. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4375. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 47. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4348. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 48. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4996. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 49. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.0413. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 50. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.1739. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 51. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4444. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 52. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.5000. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

- 53. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4999. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 54. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4524. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 55. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.1053. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 56. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4918. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 57. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.3125. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 58. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4854. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 59. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4569. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 60. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.4375. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 61. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4944. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

62. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4827. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

63. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4709. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

64. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.3750. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

65. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.2000. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

66. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4986. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

67. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.2857. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

68. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4902. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

69. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4286. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

70. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.1739. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

71. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4167. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

72. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4941. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

73. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.2500. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

74. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4444. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

75. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.4819. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

76. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4706. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

77. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4819. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

78. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4615. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

79. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4745. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

80. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.0370. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

81. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4839. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

82. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.2857. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

83. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.0763. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

84. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.4500. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

85. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.1849. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

86. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4675. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

87. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4808. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

88. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.3636. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

- 89. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.1875. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 90. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.2222. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 91. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4902. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 92. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4348. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 93. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.0714. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 94. C** — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.0385. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 95. D** — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.0023. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 96. A** — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4167. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.
- 97. B** — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.4615. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

98. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.1667. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

99. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.3660. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

100. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.4996. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

101. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4286. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

102. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.1109. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

103. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.0690. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

104. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.0413. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

105. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.4571. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

106. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 2. The resulting compressed-share index is 0.4948. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

107. C — C is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 6. The resulting compressed-share index is 0.1194. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

108. A — A is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 12. The resulting compressed-share index is 0.4703. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

109. B — B is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 20. The resulting compressed-share index is 0.0833. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.

110. D — D is correct. Compute the raw engineering answer and use its magnitude. Divide that magnitude by twice the magnitude plus reference 30. The resulting compressed-share index is 0.5000. The distractors result from using an incorrect raw answer, failing to double magnitude, omitting the reference term, or reversing the ratio. This confirms the bounded selected value.