Skillshort

Self-Study Preparation Pack

CMA FOUNDATION

Paper 3: Fundamentals of Business Mathematics and Statistics (FBMS)

Mock Test 3 – 50 MCQs with Answer Key & Working

Exam pattern: 50 MCQs · 2 marks each · 1 hour · no negative marking · original Skillshort questions (answers computed and checked by program) in the ICMAI module weightage

Section I Business Mathematics Q1–20 | Section II Statistics Q21–50 | Answer key with working at the end

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This subject pack has 6 parts

1 Chapter-wise notes | 2 Important topics & weightage | 3 Past papers: trends & links

4 Mock tests + solutions | 5 Chapter practice questions | 6 Last-week plan & strategy

Prepared by Skillshort for self-study. Original explanations and questions; not an official ICAI/ICMAI/ICSI publication. Items marked VERIFY should be checked against the latest official material.

Instructions

All 50 questions are compulsory; each carries **2 marks**. There is **no negative marking**, so attempt every question. Time: **1 hour** (in the exam Papers 3 and 4 share one 2-hour session VERIFY). A simple calculator may be used VERIFY. Score guide: 80+ excellent · 60–78 safe · 40–58 borderline · below 40 – revise from file 01 and redo file 05.

Section I – Business Mathematics (Q1–20)

1. The present value of ₹50,000 receivable after 2 years at 12% p.a. compound interest is (nearest rupee):

(a) ₹38,000 (b) ₹41,853
(c) ₹40,323 (d) ₹39,860

2. The effective annual rate of interest corresponding to a nominal rate of 8% p.a. compounded quarterly is:

(a) 8.24% (b) 8.74%
(c) 8.00% (d) 7.94%

3. The present value of ₹2,00,000 receivable after 2 years at 12% p.a. compound interest is (nearest rupee):

(a) ₹1,61,290 (b) ₹1,67,411
(c) ₹1,52,000 (d) ₹1,59,439

4. An amount of ₹12,000 is divided among P, Q and R in the ratio 6 : 4 : 2. The share of Q is:

(a) ₹4,000 (b) ₹2,000
(c) ₹6,000 (d) ₹8,000

5. The fourth proportional to 3, 5 and 6 is:

(a) 18/5 (b) 8
(c) 5/2 (d) 10

6. 12 workers can finish a job in 15 days. Working at the same rate, 9 workers will finish it in:

(a) 18 days (b) 22 days
(c) 45/4 days (d) 20 days

7. The amount of ₹40,000 at 8% p.a. simple interest for 3 years is:

(a) ₹50,388 (b) ₹9,600
(c) ₹52,800 (d) ₹49,600

8. In how many ways can 7 persons be seated at a round table?

(a) 720 (b) 120
(c) 5,040 (d) 360

9. If ${}^{n}P_{2} = 132$, then n = ?

(a) 14 (b) 13
(c) 12 (d) 11

10. If n(A) = 38, n(B) = 25 and n(A ∩ B) = 12, then n(A ∪ B) = ?

(a) 51 (b) 39
(c) 75 (d) 63

11. The value of (64)^(2/3) is:

(a) 64 (b) 16
(c) 20 (d) 8

12. Given log 2 = 0.30103, the number of digits in 2^30 is:

(a) 12 (b) 11
(c) 9 (d) 10

13. The number of arrangements of the letters of the word "STATISTICS" is:

(a) 1,00,800 (b) 36,28,800
(c) 50,400 (d) 25,200

14. If α and β are the roots of $x^2 + x - 6 = 0$, then $\alpha^2 + \beta^2$ = ?

(a) 13 (b) 14
(c) 1 (d) -11

15. In a survey, 60% of people read newspaper A, 50% read B and 20% read both. The percentage reading neither is:

(a) 30% (b) 90%
(c) 10% (d) 15%

16. A committee of 5 is to be formed from 6 men and 4 women. In how many ways can it be done if it must include at least 2 women?

(a) 252 (b) 66
(c) 336 (d) 186

17. The value of 6! ÷ 3! is:

(a) 126 (b) 6
(c) 20 (d) 120

18. If $y = x^3 + x^2 + 3$, then dy/dx at x = 3 is:

(a) 11 (b) 30
(c) 33 (d) 39

19. A product sells at ₹80 per unit; variable cost is ₹50 per unit and fixed cost is ₹6,000. The break-even quantity is:

(a) 200 units (b) 75 units
(c) 120 units (d) 250 units

20. If f(x) = 4x + 5 and $g(x) = x^2$, then f(g(4)) = ?

(a) 441 (b) 64
(c) 21 (d) 69

Section II – Statistics (Q21–50)

21. A class of width 15 has frequency 45. Its frequency density is:

(a) 675 (b) 4
(c) 3 (d) 15

22. A qualitative characteristic such as honesty or literacy is called:

(a) A variable (b) A constant
(c) A parameter (d) An attribute

23. In a pie chart, the angle of a component equals:

(a) (Component ÷ Total) × 100 (b) (Component ÷ Total) × 360°
(c) Component × 360° (d) (Total ÷ Component) × 360°

24. The standard deviation of the two numbers 7 and 51 is:

(a) 29 (b) 484
(c) 22 (d) 44

25. The variance of the first 5 natural numbers is:

(a) 3 (b) 2
(c) 4 (d) 13/6

26. The arithmetic mean of 59, 15, 46, 26, 43, 39 is:

(a) 38 (b) 36
(c) 41 (d) 39

27. The mean deviation about the median of 9, 14, 16, 20, 29 is:

(a) 13/2 (b) 26/5
(c) 10 (d) 31/5

28. Marks 44, 65, 82 carry weights 2, 5, 4 respectively. The weighted mean is:

(a) 741/11 (b) 191/11
(c) 752/11 (d) 191/3

29. The variance of the first 7 natural numbers is:

(a) 8 (b) 6
(c) 25/6 (d) 4

30. If the mean is 25 and the standard deviation is 5, the coefficient of variation is:

(a) 500% (b) 20%
(c) 2% (d) 100%

31. Marks 54, 59, 64 carry weights 3, 5, 4 respectively. The weighted mean is:

(a) 713/12 (b) 725/12
(c) 59/4 (d) 59

32. The two regression lines are $3x + 2y = 69$ and $x + 3y = 37$. The means $\bar{x}$ and $\bar{y}$ are:

(a) $\bar{x} = 19, \bar{y} = 6$ (b) $\bar{x} = 6, \bar{y} = 19$
(c) $\bar{x} = 20, \bar{y} = 5$ (d) $\bar{x} = 23, \bar{y} = 37/3$

33. If $r = 0.7$, the coefficient of determination is:

(a) 0.84 (b) 0.49
(c) 0.7 (d) 0.51

34. The two regression lines are $x + 5y = 76$ and $5x + 5y = 140$. The means $\bar{x}$ and $\bar{y}$ are:

(a) $\bar{x} = 76, \bar{y} = 28$ (b) $\bar{x} = 17, \bar{y} = 11$
(c) $\bar{x} = 16, \bar{y} = 12$ (d) $\bar{x} = 12, \bar{y} = 16$

35. The correlation coefficient is independent of:

(a) Change of origin and scale
(b) Change of origin only, not scale
(c) Neither origin nor scale
(d) Change of scale only, not origin

36. The correlation between x and y is 0.45. If $u = -2x + 5$ and $v = 3y - 7$, the correlation between u and v is:

(a) -2.7 (b) -0.45
(c) 0.3 (d) 0.45

37. If b_yx = 9/10 and b_xy = 2/5, the correlation coefficient r is:

(a) 0.36 (b) -0.6
(c) 0.6 (d) 0.650

38. For 6 pairs of ranks without ties, $\Sigma d^2 = 10$. The rank correlation coefficient is:

(a) 20/21 (b) 5/7
(c) -5/7 (d) 13/18

39. If the odds in favour of an event are 5 : 6, its probability is:

(a) 5/6 (b) 5/11
(c) 5/22 (d) 6/11

40. If P(A) = 1/2, P(B) = 3/10 and P(A ∩ B) = 1/10, the probability that neither A nor B occurs is:

(a) 3/10 (b) 7/10
(c) 7/20 (d) 9/10

41. A card is drawn from a well-shuffled pack of 52 cards. The probability that it is a queen or a spade is:

(a) 1/52 (b) 17/52
(c) 4/13 (d) 6/13

42. If P(B) = 3/10 and P(A ∩ B) = 1/10, then P(A/B) = ?

(a) 2/3 (b) 3/100
(c) 1/3 (d) 1/5

43. If P(B) = 1/2 and P(A ∩ B) = 1/10, then P(A/B) = ?

(a) 1/20 (b) 4/5
(c) 1/5 (d) 2/5

44. If the odds in favour of an event are 4 : 3, its probability is:

(a) 3/7 (b) 4/7
(c) 4/3 (d) 2/7

45. 4 fair coins are tossed together. The probability of getting at least one head is:

(a) 1/2 (b) 1/16
(c) 1/4 (d) 15/16

46. From the data below, the simple aggregative price index is (approx.):

Item	p_0	p_1	q_0
A	2	4	10
B	2	5	4
C	2	5	7

(a) 42.86 (b) 226.19
(c) 229.33 (d) 233.33

47. The 3-yearly weighted moving average of 33, 26 and 19 with weights 1, 4, 1 is:

(a) 52.00 (b) 26.02
(c) 26.00 (d) 28.00

48. Which method of measuring trend is the most objective and widely used?

(a) Free-hand method (b) Inspection method
(c) Semi-average method (d) Method of least squares

49. Business cycles of boom and depression give rise to:

(a) Cyclical variation
(b) Secular trend
(c) Irregular variation
(d) Seasonal variation

50. The 3-yearly moving average centred on 2024 is 38. The values for 2023 and 2025 are 14 and 39. The value for 2024 is:

(a) 38
(b) 53/2
(c) 64
(d) 61

Answer Key with Working

EXAM TIP Scoring

Score = 2 × correct answers (no negative marking). Redo every wrong numerical from the working shown and note the formula in your mistake log.

Answer key – Mock Test 3

Q	Ans	Explanation / working
1	(d)	PV = 50,000 ÷ (1 + 0.12)^2 = 50,000 ÷ 1.254400 = ₹39,860.
2	(a)	E = (1 + 0.0200)^4 − 1 = 8.24%.
3	(d)	PV = 2,00,000 ÷ (1 + 0.12)^2 = 2,00,000 ÷ 1.254400 = ₹1,59,439.
4	(a)	Total parts 12; one part = ₹1,000; Q = 4 × ₹1,000 = ₹4,000.
5	(d)	a : b = c : x → x = bc/a = 30/3 = 10.
6	(d)	Days vary inversely as workers: 12 × 15 ÷ 9 = 20 days.
7	(d)	SI = 40,000 × 8 × 3/100 = ₹9,600; amount = ₹49,600.
8	(a)	Circular: (n − 1)! = 6! = 720.
9	(c)	n(n − 1) = 132 → n = 12.
10	(a)	n(A ∪ B) = 38 + 25 − 12 = 51.
11	(b)	(64)^(1/3) = 4; raised to 2 → 16.
12	(d)	log 2^30 = 30 × 0.30103 = 9.031; characteristic 9 → 10 digits.
13	(c)	10 letters with repeats (S×3, T×3, I×2) → 10! ÷ 72 = 50,400.
14	(a)	$\alpha + \beta = -1$, $\alpha\beta = -6$; $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = 1 - (-12) = 13$.
15	(c)	At least one = 60 + 50 − 20 = 90% → neither = 10%.
16	(d)	Sum over j = 2 ... 4 women of 4Cj × 6C(5 − j) = 186.
17	(d)	6!/3! = 6 × 5 × 4 = 120.
18	(c)	$dy/dx = 3x^2 + 2x = 33$ at x = 3.
19	(a)	R = C → 80x = 6000 + 50x → x = 6000/30 = 200.
20	(d)	g(4) = 16; f(16) = 69.
21	(c)	Frequency density = 45/15 = 3.
22	(d)	Attributes cannot be measured, only counted.
23	(b)	Angles are proportional to values out of 360°.
24	(c)	For two numbers SD = $\lvert a - b \rvert/2$ = 22.
25	(b)	Variance = $(n^2 - 1)/12 = 24/12 = 2$.
26	(a)	Σx = 228, n = 6 → mean = 38.
27	(b)	Median = 16; $\Sigma\lvert x - 16 \rvert = 26$ → ÷ 5 = 26/5.
28	(a)	Σwx/Σw = 741/11 = 741/11.
29	(d)	Variance = $(n^2 - 1)/12 = 48/12 = 4$.
30	(b)	CV = σ/x̄ × 100 = 5/25 × 100 = 20%.
31	(a)	Σwx/Σw = 713/12 = 713/12.
32	(a)	Both lines pass through (x̄, ȳ): solving simultaneously gives x̄ = 19, ȳ = 6.
33	(b)	$r^2 = 0.49$: 49% of the variation in y is explained by x.
34	(c)	Both lines pass through (x̄, ȳ): solving simultaneously gives x̄ = 16, ȳ = 12.
35	(a)	Shifting or rescaling (positive factors) leaves r unchanged.
36	(b)	r is unaffected in magnitude by change of origin and scale; the signs of -2 and 3 are opposite → -0.45.
37	(c)	r = ±√(b_yx × b_xy) = √0.36 = 0.6, with the sign of the coefficients.

Q	Ans	Explanation / working
38	(b)	$R = 1 - 6\Sigma d^2/[n(n^2 - 1)] = 1 - 60/210 = 5/7$.
39	(b)	$P = m/(m + n) = 5/11$.
40	(a)	$1 - P(A \cup B) = 1 - 7/10 = 3/10$.
41	(c)	$P = (4 + 13 - 1)/52 = 4/13$.
42	(c)	$P(A/B) = P(A \cap B)/P(B) = 1/10/3/10 = 1/3$.
43	(c)	$P(A/B) = P(A \cap B)/P(B) = 1/10/1/2 = 1/5$.
44	(b)	$P = m/(m + n) = 4/7$.
45	(d)	$1 - P(\text{no head}) = 1 - 1/16 = 15/16$.
46	(d)	$\Sigma p_1/\Sigma p_o \times 100 = 14/6 \times 100 = 233.33$.
47	(c)	$(1\times33 + 4\times26 + 1\times19) \div 6 = 26.00$.
48	(d)	Fits a line mathematically.
49	(a)	Oscillations lasting more than a year.
50	(d)	$3 \times 38 - 14 - 39 = 61$.