Skillshort

Self-Study Preparation Pack

CMA FOUNDATION

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

Mock Test 1 – 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
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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. A sum amounts to ₹24,800 in 2 years and ₹32,000 in 5 years at simple interest. The rate of interest is:

(a) 24%
(b) 11%
(c) 14%
(d) 12%

2. Compound interest on ₹10,000 at 20% p.a. for 3 years (compounded annually) is:

(a) ₹7,715.61
(b) ₹7,280
(c) ₹6,000
(d) ₹17,280

3. A speed of 36 km/h is equal to:

(a) 15 m/s
(b) 648/5 m/s
(c) 10 m/s
(d) 6 m/s

4. The 23rd term of the AP 7, 12, 17, ... is:

(a) 161
(b) 112
(c) 122
(d) 117

5. The future value of an annuity of ₹12,000 payable at the end of each year for 5 years at 12% p.a. compound interest is (nearest rupee):

(a) ₹43,257
(b) ₹60,000
(c) ₹85,382
(d) ₹76,234

6. The 7th term of the GP 2, 4, 8, ... is:

(a) 24
(b) 256
(c) 64
(d) 128

7. A can complete a work in 18 days and B in 36 days. Working together, they will complete it in:

(a) 12 days
(b) 14 days
(c) 18 days
(d) 27 days

8. The number of arrangements of the letters of the word "INDIA" is:

(a) 62
(b) 30
(c) 120
(d) 60

9. If α and β are the roots of $x^2 - 2x - 8 = 0$, then $\alpha^2 + \beta^2 = ?$

(a) -12
(b) 20
(c) 21
(d) 4

10. In a survey, 70% of people read newspaper A, 45% read B and 25% read both. The percentage reading only A is:

(a) 20%
(b) 45%
(c) 70%
(d) 90%

11. A committee of 5 is to be formed from 8 men and 4 women. In how many ways can it be done if it must include at least 1 woman?

(a) 456 (b) 736
(c) 792 (d) 1,320

12. The value of 8! ÷ 5! is:

(a) 344 (b) 336
(c) 6 (d) 56

13. If α and β are the roots of $x^2 - 7x + 12 = 0$, the equation whose roots are 2α and 2β is:

(a) $x^2 - 7x + 48 = 0$ (b) $x^2 - 14x + 24 = 0$
(c) $x^2 - 14x + 48 = 0$ (d) $x^2 - 14x + 12 = 0$

14. In how many ways can 8 different beads be strung into a necklace?

(a) 2,520 (b) 5,040
(c) 20,160 (d) 40,320

15. If ⁿC2 = ⁿC4, then n = ?

(a) 6 (b) 8
(c) 4 (d) 5

16. If A has 2 elements and B has 3 elements, the number of relations from A to B is:

(a) 32 (b) 9
(c) 64 (d) 6

17. The value of (32)^(2/5) is:

(a) 2 (b) 6
(c) 4 (d) 8

18. If $f(x) = 4x + 7$ and $g(x) = x^2$, then f(g(3)) = ?

(a) 43 (b) 19
(c) 361 (d) 36

19. The total cost function is $C(x) = 2x^2 + 3x + 800$. The minimum average cost is:

(a) ₹86 (b) ₹83
(c) ₹88 (d) ₹1,660

20. The total cost function is $C(x) = x^2 + 27x + 500$. The marginal cost at x = 48 is:

(a) ₹85.42 (b) ₹75
(c) ₹123 (d) ₹4,100

Section II – Statistics (Q21–50)

21. The mode of a frequency distribution can be located graphically from a:

(a) Ogive (b) Histogram
(c) Line graph (d) Pie chart

22. Data collected by the investigator for the first time for a specific purpose are:

(a) Secondary data (b) Derived data
(c) Primary data (d) Grouped data

23. In a pie chart showing a total expenditure of ₹18,000, the angle for an item costing ₹4,500 is:
(a) 120° (b) 25°
(c) 90° (d) 45°

24. The variance of the first 9 natural numbers is:
(a) 20/3 (b) 40/3
(c) 5 (d) 41/6

25. If the mean is 80 and the standard deviation is 12, the coefficient of variation is:
(a) 666.67% (b) 180%
(c) 1.50% (d) 15%

26. The mean deviation about the median of 4, 13, 15, 25, 26 is:
(a) 11 (b) 34/5
(c) 39/5 (d) 17/2

27. The sum of squared deviations is minimum when taken from the:
(a) Median (b) Arithmetic mean
(c) Mode (d) Geometric mean

28. Group A has 25 items with mean 65 and group B has 75 items with mean 62. The combined mean is:
(a) 251/4 (b) 257/4
(c) 127/2 (d) 255/4

29. Marks 50, 56, 57 carry weights 3, 4, 1 respectively. The weighted mean is:
(a) 431/8 (b) 439/8
(c) 163/3 (d) 163/8

30. The arithmetic mean of 30, 47, 32, 38, 42, 59, 32, 40 is:
(a) 41 (b) 38
(c) 43 (d) 40

31. The mean deviation about the median of 3, 18, 19, 21, 28 is:
(a) 28/5 (b) 33/5
(c) 25/2 (d) 7

32. Mean of x = 22, mean of y = 55 and b_{yx} = 3/5. The estimated value of y when x = 59 is:
(a) 386/5 (b) 452/5
(c) 381/5 (d) 416/5

33. If r = 0.8, the coefficient of determination is:
(a) 0.64 (b) 0.36
(c) 0.8 (d) 0.89

34. If r = 0.5, the coefficient of determination is:
(a) 0.25 (b) 0.71
(c) 0.75 (d) 0.5

35. The rank correlation coefficient between two sets of ranks is 37/40 and $\Sigma d^2 = 9$. The number of pairs n is:
(a) 9 (b) 8
(c) 11 (d) 10

36. The two regression lines are $x + 4y = 71$ and $4x + y = 59$. The means $\bar{x}$ and $\bar{y}$ are:

(a) $\bar{x} = 12, \bar{y} = 14$ (b) $\bar{x} = 15, \bar{y} = 11$
(c) $\bar{x} = 11, \bar{y} = 15$ (d) $\bar{x} = 71, \bar{y} = 59$

37. The rank correlation coefficient between two sets of ranks is 6/7 and $\Sigma d^2 = 5$. The number of pairs n is:

(a) 8 (b) 7
(c) 5 (d) 6

38. The two regression lines are $x + 3y = 36$ and $3x + 3y = 54$. The means $\bar{x}$ and $\bar{y}$ are:

(a) $\bar{x} = 10, \bar{y} = 8$ (b) $\bar{x} = 9, \bar{y} = 9$
(c) $\bar{x} = 36, \bar{y} = 18$ (d) $\bar{x} = 11, \bar{y} = 11$

39. If $P(A) = 1/2$, $P(B) = 1/5$ and $P(A \cap B) = 1/10$, the probability that neither A nor B occurs is:

(a) 9/10 (b) 3/10
(c) 2/5 (d) 3/5

40. A and B are independent events with $P(A) = 4/5$ and $P(B) = 1/4$. The probability that at least one of them occurs is:

(a) 17/20 (b) 3/20
(c) 9/10 (d) 1/5

41. The probability of an impossible event is:

(a) −1 (b) 0.5
(c) 1 (d) 0

42. A bag contains 3 red and 6 white balls. Two balls are drawn at random without replacement. The probability that both are red is:

(a) 1/9 (b) 5/12
(c) 1/3 (d) 1/12

43. 2 fair coins are tossed together. The probability of getting at least one head is:

(a) 1/4 (b) 3/4
(c) 5/4 (d) 1/2

44. 3 fair coins are tossed together. The probability of getting at least one head is:

(a) 7/8 (b) 1/2
(c) 3/8 (d) 1/8

45. X takes values 1, 2, 3 with probabilities 1/5, 3/5, 1/5. Var(X) = ?

(a) 2 (b) 22/5
(c) 12/5 (d) 2/5

46. From the data below, Laspeyres' price index is (approx.):

Item	p_0	p_1	q_0
A	2	3	9
B	2	4	5
C	2	7	9

(a) 41.82 (b) 239.13
(c) 244.13 (d) 233.33

47. Converting money values into real values with a price index is called:

(a) Chain linking
(b) Deflating
(c) Splicing
(d) Base shifting

48. The multiplicative model of a time series is:

(a) $Y = T \times S + C \times I$
(b) $Y = T + S \times C$
(c) $Y = T \times S \times C \times I$
(d) $Y = T + S + C + I$

49. From the data below, the 3-yearly moving average for 2022 is:

Year	2020	2021	2022	2023	2024
Sales	40	56	20	13	14

(a) 15.67
(b) 30.67
(c) 29.67
(d) 28.60

50. The 3-yearly weighted moving average of 19, 14 and 27 with weights 1, 4, 1 is:

(a) 19.00
(b) 17.00
(c) 34.00
(d) 20.00

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 1

Q	Ans	Explanation / working
1	(d)	SI for 3 years = ₹7,200 → 1 year ₹2,400; P = ₹24,800 − 2 × ₹2,400 = ₹20,000; R = 2,400 × 100/20,000 = 12%.
2	(b)	A = 10,000 × (1.2)^3 = ₹17,280; CI = ₹7,280.
3	(c)	36 × 5/18 = 10 m/s.
4	(d)	$t_n = a + (n - 1)d = 7 + 22 \times 5 = 117$.
5	(d)	FV = 12,000 × [(1.12)^5 − 1]/0.12 = 12,000 × 6.3528 = ₹76,234.
6	(d)	$t_n = ar^{n-1} = 2 \times 2^6 = 128$.
7	(a)	1/18 + 1/36 = 1/12 per day → 12 days.
8	(d)	5 letters with repeats (I×2) → 5! ÷ 2 = 60.
9	(b)	$\alpha + \beta = 2$, $\alpha\beta = -8$; $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = 4 - (-16) = 20$.
10	(b)	Only A = 70 − 25 = 45%.
11	(b)	Sum over j = 1 ... 4 women of 4Cj × 8C(5 − j) = 736.
12	(b)	8!/5! = 8 × 7 × 6 = 336.
13	(c)	New sum = 2(α + β) = 14; new product = 4αβ = 48.
14	(a)	Clockwise and anticlockwise are the same: (n − 1)!/2 = 2,520.
15	(a)	${}^nC_r = {}^nC_s$ ($r \neq s$) ⇒ r + s = n → n = 2 + 4 = 6.
16	(c)	Relations = subsets of A × B = 2^(2×3) = 64.
17	(c)	(32)^(1/5) = 2; raised to 2 → 4.
18	(a)	g(3) = 9; f(9) = 43.
19	(b)	AC minimum at x = √(800/2) = 20; AC = 40 + 3 + 40 = ₹83 (= MC at that point).
20	(c)	MC = dC/dx = 2x + 27 = 123 at x = 48.
21	(b)	Draw the diagonals in the tallest rectangle.
22	(c)	First-hand data are primary.
23	(c)	4,500/18,000 × 360° = 90°.
24	(a)	Variance = $(n^2 - 1)/12 = 80/12 = 20/3$.
25	(d)	CV = $\sigma/\bar{x} \times 100 = 12/80 \times 100 = 15\%$.
26	(b)	Median = 15; $\Sigma|x - 15| = 34$ → ÷ 5 = 34/5.
27	(b)	Least-squares property of the mean.
28	(a)	(25×65 + 75×62)/100 = 251/4.
29	(a)	$\Sigma wx/\Sigma w = 431/8 = 431/8$.
30	(d)	$\Sigma x = 320$, n = 8 → mean = 40.
31	(a)	Median = 19; $\Sigma|x - 19| = 28$ → ÷ 5 = 28/5.
32	(a)	$y - \bar{y} = b_{yx}(x - \bar{x})$ → y = 55 + 3/5(59 − 22) = 386/5.
33	(a)	$r^2 = 0.64$: 64% of the variation in y is explained by x.
34	(a)	$r^2 = 0.25$: 25% of the variation in y is explained by x.
35	(a)	$1 - 6 \times 9/[n(n^2 - 1)] = 37/40$ → $n(n^2 - 1) = 720$ → n = 9.
36	(c)	Both lines pass through $(\bar{x}, \bar{y})$: solving simultaneously gives $\bar{x} = 11$, $\bar{y} = 15$.
37	(d)	$1 - 6 \times 5/[n(n^2 - 1)] = 6/7$ → $n(n^2 - 1) = 210$ → n = 6.

Q	Ans	Explanation / working
38	(b)	Both lines pass through $(\bar{x}, \bar{y})$: solving simultaneously gives $\bar{x} = 9$, $\bar{y} = 9$.
39	(c)	$1 - P(A \cup B) = 1 - 3/5 = 2/5$.
40	(a)	$1 - P(A')P(B') = 1 - 1/5 \times 3/4 = 17/20$.
41	(d)	An impossible event has no favourable case.
42	(d)	3C2/9C2 = 3/36 = 1/12.
43	(b)	1 − P(no head) = 1 − 1/4 = 3/4.
44	(a)	1 − P(no head) = 1 − 1/8 = 7/8.
45	(d)	$E(X) = 2$, $E(X^2) = 22/5 \rightarrow$ Var = 22/5 − 4 = 2/5.
46	(b)	$\Sigma p_1 q_0 / \Sigma p_0 q_0 \times 100 = 110/46 \times 100 = 239.13$.
47	(b)	Real value = money value ÷ index × 100.
48	(c)	Components are multiplied.
49	(c)	(56 + 20 + 13)/3 = 29.67.
50	(b)	(1×19 + 4×14 + 1×27) ÷ 6 = 17.00.