Skillshort

Self-Study Preparation Pack

CMA FOUNDATION

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

Mock Test 2 – 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 sum of the first 14 terms of the AP 8, 12, 16, ... is:

(a) 532 (b) 468
(c) 840 (d) 476

2. The present value of ₹20,000 received at the end of each year for 5 years at 8% p.a. is (nearest rupee):

(a) ₹1,17,332 (b) ₹86,243
(c) ₹1,00,000 (d) ₹79,854

3. The sum to infinity of the GP 9, 3, 1, ... is:

(a) 19 (b) 27/4
(c) 29/2 (d) 27/2

4. A can complete a work in 30 days and B in 60 days. Working together, they will complete it in:

(a) 20 days (b) 30 days
(c) 45 days (d) 22 days

5. The effective annual rate of interest corresponding to a nominal rate of 12% p.a. compounded monthly is:

(a) 12.68% (b) 12.38%
(c) 13.18% (d) 12.00%

6. The present value of ₹1,00,000 receivable after 2 years at 10% p.a. compound interest is (nearest rupee):

(a) ₹86,777 (b) ₹82,645
(c) ₹80,000 (d) ₹83,333

7. An amount of ₹15,000 is divided among P, Q and R in the ratio 6 : 5 : 4. The share of Q is:

(a) ₹6,000 (b) ₹4,000
(c) ₹10,000 (d) ₹5,000

8. A committee of 5 is to be formed from 7 men and 5 women. In how many ways can it be done if it must include at least 3 women?

(a) 36 (b) 792
(c) 360 (d) 246

9. If α and β are the roots of $x^2 - 5x + 4 = 0$, the equation whose roots are 3α and 3β is:

(a) $x^2 - 15x + 4 = 0$ (b) $x^2 - 5x + 36 = 0$
(c) $x^2 - 15x + 12 = 0$ (d) $x^2 - 15x + 36 = 0$

10. If α and β are the roots of $x^2 - 7x + 10 = 0$, the equation whose roots are 2α and 2β is:

(a) $x^2 - 14x + 10 = 0$ (b) $x^2 - 14x + 40 = 0$
(c) $x^2 - 7x + 40 = 0$ (d) $x^2 - 14x + 20 = 0$

11. In how many ways can 6 persons sit around a round table if two particular persons always sit together?

(a) 24 (b) 120
(c) 48 (d) 240

12. If ${}^nP_2 = 56$, then n = ?

(a) 8 (b) 9
(c) 7 (d) 10

13. If A has 3 elements and B has 4 elements, the number of relations from A to B is:

(a) 64 (b) 128
(c) 4,096 (d) 12

14. The value of (16)^(3/4) is:

(a) 6 (b) 8
(c) 10 (d) 16

15. Given log 2 = 0.30103, the number of digits in 2^40 is:

(a) 12 (b) 13
(c) 14 (d) 15

16. The number of arrangements of the letters of the word "LETTER" is:

(a) 90 (b) 720
(c) 360 (d) 180

17. If α and β are the roots of $x^2 + 4x + 3 = 0$, then $\alpha^3 + \beta^3$ = ?

(a) -29 (b) -28
(c) -100 (d) -64

18. A product sells at ₹40 per unit; variable cost is ₹24 per unit and fixed cost is ₹8,000. The break-even quantity is:

(a) 550 units (b) 500 units
(c) 200 units (d) 1000/3 units

19. The inverse of f(x) = 2x + 1 is:

(a) (x − 1)/2 (b) 2x − 1
(c) x/2 − 1 (d) (x + 1)/2

20. The total cost function is $C(x) = 4x^2 + 6x + 400$. The minimum average cost is:

(a) ₹91 (b) ₹86
(c) ₹860 (d) ₹92

Section II – Statistics (Q21–50)

21. In a pie chart showing a total expenditure of ₹1,200, the angle for an item costing ₹300 is:

(a) 90° (b) 120°
(c) 45° (d) 25°

22. A class of width 8 has frequency 24. Its frequency density is:

(a) 4 (b) 192
(c) 3 (d) 8

23. The class mark of the class 10–30 is:

(a) 20 (b) 10
(c) 22 (d) 30

24. For averaging speeds over equal distances, the appropriate average is the:

(a) Geometric mean (b) Mode
(c) Arithmetic mean (d) Harmonic mean

25. The variance of the first 11 natural numbers is:

(a) 61/6 (b) 10
(c) 20 (d) 6

26. The mean deviation about the median of 7, 8, 10, 22, 28 is:

(a) 8 (b) 21/2
(c) 35/4 (d) 7

27. The most suitable average for qualitative data such as intelligence is:

(a) Harmonic mean (b) Arithmetic mean
(c) Geometric mean (d) Median

28. The arithmetic mean of 47, 21, 18, 30, 19, 11, 56, 14 is:

(a) 25 (b) 27
(c) 30 (d) 28

29. If the standard deviation of x is 9, the standard deviation of y = 6 + 3x is:

(a) 27 (b) 33
(c) 9 (d) 81

30. For a moderately skewed distribution, mean = 41 and median = 36. The mode is approximately:

(a) 26 (b) 39
(c) 31 (d) 51

31. If $Q_1 = 17$ and $Q_3 = 73$, the coefficient of quartile deviation is:

(a) 28.0000 (b) 1.6071
(c) 0.7671 (d) 0.6222

32. The correlation between x and y is 0.7. If u = 4x + 5 and v = -5y − 7, the correlation between u and v is:

(a) -0.7 (b) -14.0
(c) 0.7 (d) 0.56

33. Correlation between price and demand is usually:

(a) Negative (b) Perfect positive
(c) Positive (d) Zero

34. Mean of x = 26, mean of y = 31 and b_yx = 1/5. The estimated value of y when x = 38 is:

(a) 177/5 (b) 162/5
(c) 167/5 (d) 193/5

35. If r = ±1, the two regression lines:

(a) Do not meet (b) Are parallel
(c) Are perpendicular (d) Coincide

36. For 8 pairs of ranks without ties, $\Sigma d^2 = 14$. The rank correlation coefficient is:

(a) 107/128 (b) -5/6
(c) 35/36 (d) 5/6

37. The correlation between x and y is 0.7. If u = -2x + 5 and v = 3y − 7, the correlation between u and v is:

(a) -4.2 (b) 0.47
(c) -0.7 (d) 0.7

38. A scatter diagram in which points rise from the lower left to the upper right shows:

(a) No correlation (b) Curvilinear correlation only
(c) Negative correlation (d) Positive correlation

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

(a) 22/5 (b) 2
(c) 9/5 (d) 21/10

40. A card is drawn from a well-shuffled pack of 52 cards. The probability that it is a king or a heart is:

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

41. 2 fair coins are tossed together. The probability of getting exactly 1 head is:

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

42. If P(A) = 2/5, P(B) = 1/5 and P(A ∩ B) = 1/10, then P(A ∪ B) = ?

(a) 3/5 (b) 2/25
(c) 3/2 (d) 1/2

43. If P(A) = 2/5, P(B) = 3/10 and P(A ∩ B) = 1/10, then P(A ∪ B) = ?

(a) 3/25 (b) 3/5
(c) 2/5 (d) 7/10

44. A bag contains 4 red and 3 white balls. Two balls are drawn at random without replacement. The probability that both are red is:

(a) 16/49 (b) 1/7
(c) 2/7 (d) 4/7

45. If A and B are mutually exclusive, P(A ∪ B) equals:

(a) P(A) + P(B) − P(A)P(B) (b) 1 − P(A)P(B)
(c) P(A) × P(B) (d) P(A) + P(B)

46. The price of a commodity rose from ₹60 in the base year to ₹75 in the current year. The price relative is:

(a) 80 (b) 125
(c) 25 (d) 15

47. From the data below, the 3-yearly moving average for 2021 is:

Year	2020	2021	2022	2023	2024
Sales	17	58	33	13	55

(a) 37.00 (b) 34.67
(c) 35.20 (d) 36.00

48. From the data below, Paasche's price index is (approx.):

Item	p_0	p_1	q_1
A	6	10	2
B	6	9	8
C	6	8	9

(a) 69.51
(b) 150.00
(c) 143.86
(d) 148.86

49. A worker's money wage is ₹30,000 and the consumer price index is 150 (base = 100). The real wage is:

(a) ₹15,000
(b) ₹45,000
(c) ₹20,000
(d) ₹200

50. The price of a commodity rose from ₹40 in the base year to ₹50 in the current year. The price relative is:

(a) 10
(b) 80
(c) 125
(d) 25

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 2

Q	Ans	Explanation / working
1	(d)	S_n = n/2 [2a + (n − 1)d] = 14/2 × [16 + 52] = 476.
2	(d)	PV = 20,000 × [1 − (1.08)^−5]/0.08 = 20,000 × 3.9927 = ₹79,854.
3	(d)	S∞ = a/(1 − r) = 9/(1 − (1/3)) = 27/2.
4	(a)	1/30 + 1/60 = 1/20 per day → 20 days.
5	(a)	E = (1 + 0.0100)^12 − 1 = 12.68%.
6	(b)	PV = 1,00,000 ÷ (1 + 0.1)^2 = 1,00,000 ÷ 1.210000 = ₹82,645.
7	(d)	Total parts 15; one part = ₹1,000; Q = 5 × ₹1,000 = ₹5,000.
8	(d)	Sum over j = 3 ... 5 women of 5Cj × 7C(5 − j) = 246.
9	(d)	New sum = 3(α + β) = 15; new product = 9αβ = 36.
10	(b)	New sum = 2(α + β) = 14; new product = 4αβ = 40.
11	(c)	Treat the pair as one: (n − 2)! × 2! = 4! × 2 = 48.
12	(a)	n(n − 1) = 56 → n = 8.
13	(c)	Relations = subsets of A × B = 2^(3×4) = 4,096.
14	(b)	(16)^(1/4) = 2; raised to 3 → 8.
15	(b)	log 2^40 = 40 × 0.30103 = 12.041; characteristic 12 → 13 digits.
16	(d)	6 letters with repeats (E×2, T×2) → 6! ÷ 4 = 180.
17	(b)	$\alpha^3 + \beta^3 = (\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)$ = -64 − 3(3)(-4) = -28.
18	(b)	R = C → 40x = 8000 + 24x → x = 8000/16 = 500.
19	(a)	y = 2x + 1 → x = (y − 1)/2.
20	(b)	AC minimum at x = √(400/4) = 10; AC = 40 + 6 + 40 = ₹86 (= MC at that point).
21	(a)	300/1,200 × 360° = 90°.
22	(c)	Frequency density = 24/8 = 3.
23	(a)	Class mark = (10 + 30)/2 = 20.
24	(d)	HM gives the correct average speed.
25	(b)	Variance = $(n^2 - 1)/12$ = 120/12 = 10.
26	(d)	Median = 10; Σ|x − 10| = 35 → ÷ 5 = 7.
27	(d)	Items can be ranked but not measured.
28	(b)	Σx = 216, n = 8 → mean = 27.
29	(a)	SD(y) = |b| × SD(x) = 3 × 9 = 27; the constant 6 has no effect.
30	(a)	Mode = 3 Median − 2 Mean = 108 − 82 = 26.
31	(d)	$(Q_3 - Q_1)/(Q_3 + Q_1)$ = 56/90 = 0.6222.
32	(a)	r is unaffected in magnitude by change of origin and scale; the signs of 4 and -5 are opposite → -0.7.
33	(a)	Price up → demand down.
34	(c)	$y - \bar{y} = b_{yx}(x - \bar{x})$ → y = 31 + 1/5(38 − 26) = 167/5.
35	(d)	Perfect correlation – a single line.
36	(d)	$R = 1 - 6\Sigma d^2/[n(n^2 - 1)]$ = 1 − 84/504 = 5/6.
37	(c)	r is unaffected in magnitude by change of origin and scale; the signs of -2 and 3 are opposite → -0.7.

Q	Ans	Explanation / working
38	(d)	Variables move in the same direction.
39	(b)	E(X) = Σxp = 2.
40	(c)	P = (4 + 13 − 1)/52 = 4/13.
41	(b)	$^nC_k/2^n$ = 2/4 = 1/2.
42	(d)	P(A ∪ B) = 2/5 + 1/5 − 1/10 = 1/2.
43	(b)	P(A ∪ B) = 2/5 + 3/10 − 1/10 = 3/5.
44	(c)	4C2/7C2 = 6/21 = 2/7.
45	(d)	P(A ∩ B) = 0 for exclusive events.
46	(b)	$p_1/p_o \times 100 = 75/60 \times 100 = 125$.
47	(d)	(17 + 58 + 33)/3 = 36.00.
48	(c)	$\Sigma p_1q_1/\Sigma p_oq_1 \times 100 = 164/114 \times 100 = 143.86$.
49	(c)	Real wage = 30,000 ÷ 150 × 100 = ₹20,000.
50	(c)	$p_1/p_o \times 100 = 50/40 \times 100 = 125$.