

MasterG.Net CBSE Coaching Classes

Academic Excellence & Conceptual Mastery • Classes VIII – XII

Website: www.masterg.net • Helpline: 9910725407 • Subject: Economics (Statistics)

Topic: Measures of Central Tendency – Arithmetic Mean

Class: XI (CBSE 2026–27)

Time: 2 Hours

Student Name:

Roll No:

Max Marks: 60 Marks

General Instructions:

1. Paper contains 22 questions across Sections A to E. All questions are compulsory.
2. Section A (Q1-Q6): 1 mark each • Section B (Q7-Q11): 2 marks each • Section C (Q12-Q17): 3 marks each.
3. Section D (Q18-Q20): 5 marks each • Section E (Q21-Q22): Case Studies, 4 marks each (with internal choices).
4. Use of calculators is strictly prohibited. Write structured steps, equations, and neat calculation tables.

SECTION A: Multiple Choice Questions (1 Mark Each)

1. The algebraic sum of deviations of a set of n values from their arithmetic mean, i.e., $\sum(X - \bar{X})$, is always: [1]
(a) Minimum (b) Zero
(c) 1 (d) $\bar{X} / n$
2. The mean wage of 100 workers in a factory is Rs. 284. If the mean wage of 70 workers is Rs. 290, then the mean wage of the remaining 30 workers is: [1]
(a) Rs. 275 (b) Rs. 280
(c) Rs. 270 (d) Rs. 268
3. The mean of 12 numbers is 24. If 5 is added to each number, and the resulting values are then multiplied by 2, the new mean is: [1]
(a) 29 (b) 58
(c) 53 (d) 48
4. The arithmetic mean of the six observations 1, 3, 5, 6, x , 10 is 6. The value of the missing observation x is: [1]
(a) 10 (b) 11
(c) 12 (d) 9
5. The Weighted Arithmetic Mean ($\bar{X}_W$) is strictly greater than the Simple Arithmetic Mean ($\bar{X}$) when: [1]
(a) Equal weights are given to all items (b) Larger weights are assigned to larger items
(c) Smaller weights are assigned to larger items (d) Series has open-end class intervals
6. Assertion (A): In an open-end continuous series (e.g. "Below 20" or "Above 140"), arithmetic mean cannot be calculated without assuming missing limits. [1]
Reason (R): Calculation of arithmetic mean requires exact mid-points (m) of every class interval.
(a) Both (A) and (R) are true and (R) explains (A) (b) Both are true but (R) does not explain (A)
(c) (A) is true but (R) is false (d) (A) is false but (R) is true

SECTION B: Very Short Answer Questions (2 Marks Each)

7. State any two essential requisites of an ideal measure of central tendency. [2]

8. The mean of a series of 5 items is 25, and the values of four items are 10, 25, 35, and 40. Find the value of the 5th item. [2]

9. (Corrected Mean) The average weight of a group of 20 boys was calculated to be 89.4 kg. It was later discovered that one weight was misread as 78 kg instead of 87 kg. Calculate the correct average weight. [2]

10. (Calculation of Missing Item) The arithmetic mean of the following discrete distribution is 41. Find the missing item x: [2]

Marks (X)	20	30	40	x	60	70
No. of Students (f)	8	12	20	10	6	4

11. (Combined Mean) The mean height of 25 male workers in a factory is 61 inches and that of 35 female workers in the same factory is 58 inches. Find the combined mean height of all 60 workers. [2]

SECTION C: Short Answer Questions (3 Marks Each)

12. The marks of 8 students in a surprise test are: 30, 45, 60, 40, 15, 65, 85, 20. Calculate the arithmetic mean by: (i) Direct Method, (ii) Short-Cut Method, and (iii) Step-Deviation Method. [3]

13. The average marks in Statistics of 10 students of a class were 68. Later, a new student was admitted with 72 marks while two existing students left the institution whose marks were 40 and 39. Calculate the corrected average marks of the remaining class. [3]

14. Locate the missing frequency (f) from the following data if the arithmetic mean is 29: [3]

Variable (X)	5	15	25	35	45	55
Frequency (f)	5	7	? (f)	18	5	3

15. State any three merits and any two demerits of Arithmetic Mean as a measure of central tendency. [3]

16. Compute the Arithmetic Mean from the following frequency distribution. Also apply Charlier's Accuracy Check to verify your calculations: [3]

Class Interval	20-25	25-30	30-35	35-40	40-45	45-50	50-55
Frequency (f)	10	12	8	20	11	4	5

17. The mean weight of 150 students in a senior secondary school is 60 kg. The mean weight of boys is 70 kg and that of girls is 55 kg. Find the total number of boys and girls in the school. [3]

SECTION D: Long Answer Questions (5 Marks Each)

18. From the following "More Than" cumulative frequency distribution of Economics marks obtained by 50 students, convert it into an exclusive frequency distribution and calculate the arithmetic mean using the Step-Deviation Method: [5]

Marks (More than)	0	10	20	30	40	50
No. of Students	50	45	38	26	10	4

19. An examination was held to decide the award of an academic merit scholarship. The weights allotted to various subjects and the marks secured by three candidates (out of 100) are given below: [5]

Subject	Weights (W)	Student A	Student B	Student C
Mathematics	4	60	57	62
Business Studies	3	62	61	67
Economics	2	55	53	60
English	1	67	77	49

- (a) Calculate Simple Arithmetic Mean for Students A, B, and C.
 (b) Calculate Weighted Arithmetic Mean for Students A, B, and C.
 (c) Who should be awarded the scholarship? Give an economic/statistical justification for the difference in results.

20. In the following distribution, the frequency of the class interval 50–60 is missing. Find it out, given that the arithmetic mean of the distribution is 52: [5]

Class Interval	10–20	20–30	30–40	40–50	50–60	60–70	70–80
No. of Students	5	3	4	7	?	6	13

Also state the operational rule used to calculate mean if the first class was "Below 20" and the last class was "Above 70" (Open-end Series).

SECTION E: Case-Based Competency Questions (4 Marks Each)

21. Case Study 1: Enterprise Payroll Audit & Wage Adjustments

A labour economics consultant audited a manufacturing plant employing 1,000 workers. The preliminary mean monthly wage was reported as Rs. 180.40. During statutory verification, it was found that the wages of two employees were wrongly recorded as Rs. 297 and Rs. 165 instead of their true wages of Rs. 197 and Rs. 185 respectively.

Additionally, the factory operates two wings: Wing 1 (Skilled) with 600 workers having an average salary of Rs. 190, and Wing 2 (Unskilled) with 400 workers.

1. Calculate the Corrected Total Wage Bill and the Corrected Mean Salary for the 1,000 employees. [2]
2. Using the Combined Mean relationship, compute the initial average salary of the 400 unskilled workers in Wing 2. [2]

OR

If management grants a flat Diwali bonus of Rs. 25 to every worker, followed by a 5% welfare fund deduction on the total new pay, calculate the revised mean wage using algebraic properties. [2]

22. Case Study 2: Household Budgeting & Food Price Indexation

To evaluate middle-class family consumption, an economic survey collected monthly grocery purchases and prices:

Food Item	Monthly Quantity (kg) [W]	Price per kg (Rs.) [X]
Wheat Flour	300	10
Rice	400	20
Sugar	200	15
Potatoes	500	7

1. Calculate the Simple Arithmetic Mean of the prices of these four items. [1]
2. Calculate the Weighted Arithmetic Mean price per kg using quantity consumed as weights. [2]
3. Why does Simple Mean fail to reflect true living costs compared to Weighted Mean? [1]

OR

Under what specific weighting condition is the Weighted Mean strictly less than the Simple Mean? Demonstrate with a small 2-item numerical example. [2]