PART B

Workbook [कार्य-पुस्तिका]

[Competency-based Learning through **Objective Questions**]

SET-1

Fill in the Blanks

Choose appropriate word/term and fill in the blank:

1. Mean is a _____ average. (mathematical/positional)
2. In case of _____ mean, all items of a series are given equal importance. (simple/weighted)
3. An average is a/an _____. (absolute number/ratio)
4. Assumed mean is used in _____ method. (direct/step-deviation)
5. Arithmetic mean is not suitable for _____ values. (absolute/percentage)
6. Arithmetic mean is _____ by the extreme values of a series. (affected/unaffected)
7. The product of arithmetic mean and the number of items on which mean is based is equal to the _____ of all given items. (sum/product)
8. The sum of _____ deviations of the items from arithmetic mean is minimum. (squared/cubed)
9. To find step-deviations, the deviations are _____ by common factor. (multiplied/divided)
10. In weighted arithmetic mean, different items of a series are weighed according to their _____. (relative importance/absolute importance)

SET-2

Multiple Choice

Choose the correct option:

1. **A single value within the range of data that is used to represent all the values in the series is called a/an _____.**
   (*a*) average (*b*) relative number
   (*c*) both (*a*) and (*b*) (*d*) none of these
2. **Which of the following is a type of positional average?**
   (*a*) Median (*b*) Partition value
   (*c*) Mode (*d*) All of these
3. **Deviation is calculated in:**
   (*a*) direct method (*b*) assumed mean method
   (*c*) step-deviation method (*d*) both (*b*) and (*c*)
4. **_____ method is adopted when deviations from the assumed mean have some common factor.**
   (*a*) Direct (*b*) Assumed mean
   (*c*) Step-deviation (*d*) All of these

5. **When all the items of the series are multiplied by 5, the mean of the series will:**
(*a*) remain same (*b*) be multiplied by 5
(*c*) increase by 5 (*d*) be divided by 5

6. **In case of continuous series, the mid-point corresponds to _____ .**
(*a*) frequency
(*b*) lower limit of class interval
(*c*) average of lower and upper limit of the class interval
(*d*) upper limit of class interval

7. **Deviations in step-deviation method are calculated as:**
(*a*) $\frac{d}{C}$ (*b*) $\frac{C}{d}$
(*c*) d + C (*d*) d – C

8. **Which average is affected most by the presence of extreme items?** [NCERT]
(*a*) Median (*b*) Mode
(*c*) Arithmetic mean (*d*) None of the above

9. **Arithmetic mean is a:**
(*a*) stable value (*b*) certain value
(*c*) both (*a*) and (*b*) (*d*) none of these

10. **The most suitable average for qualitative measurement is:** [NCERT]
(*a*) arithmetic mean (*b*) median
(*c*) mode (*d*) geometric mean

11. **For calculating mean of continuous series, the _____ of class interval is calculated.**
(a) lower limit (*b*) upper limit
(*c*) mid-value (*d*) none of these

12. **If the arithmetic mean of a series is 15 and if 3 is added to every item of the series then the new arithmetic mean will be:**
(*a*) 3 (*b*) 12
(*c*) 18 (*d*) 10

13. **Arithmetic mean of these items: 2, 4, X, 8 is 5. Find out the missing item.**
(*a*) 2 (*b*) 4
(*c*) 6 (*d*) 8

14. **Mean of 20 values is 45. If one of these values is to be taken as 66 instead of 46, the correct mean would be:**
(*a*) 43 (*b*) 44
(*c*) 42 (*d*) 47

15. **Average income of 20 families is ₹ 3,000. Of these average income of 12 families is ₹ 1,850, the average income of the remaining families would be:**
(*a*) ₹ 4,565 (*b*) ₹ 4,725
(*c*) ₹ 4,810 (*d*) ₹ 4,870

SET-3

True or False

State whether the following statements are True or False:

1. A good average should be least affected by a change in the sample on which the average is based. (True/False)
2. Arithmetic mean passes the test of accuracy. (True/False)
3. The sum of deviations of the items from arithmetic mean is always zero. (True/False)
4. If each item of the original series is replaced by the actual mean, then the difference of these substitutions will be equal to the sum of the individual items. (True/False)
5. To calculate the mean of the inclusive series, it must first be converted into exclusive series. (True/False)
6. Arithmetic mean can never be a negative number. (True/False)
7. For calculating the mean of continuous series, the mid-value of the class intervals is calculated. (True/False)
8. Average fails to represent the mass of statistical data. (True/False)
9. The mid-value series is converted into exclusive series for calculation of arithmetic mean. (True/False)
10. Step-deviation method is used when deviations from the assumed mean happen to be large values. (True/False)

SET-4

True-False Alternatives

In the following questions (1-5), two statements are given. Read the statements carefully and choose the correct alternative among those given below:

Alternatives:

(*a*) Both the statements are true
(*b*) Both the statements are false
(*c*) Statement 1 is true and Statement 2 is false
(*d*) Statement 2 is true and Statement 1 is false

1. **Statement 1** : Arithmetic mean is a certain value; it has no scope for estimated values.
   Statement 2 : Arithmetic mean is a suitable measure in case of percentage or proportionate values
2. **Statement 1** : Arithmetic mean is extensively used in statistical analysis as it is capable of further algebraic treatment.
   Statement 2 : Weighted arithmetic mean is the mean of weighted items of the series.
3. **Statement 1** : Arithmetic mean is based on all the items in a series.
   Statement 2 : Being stable and certain, arithmetic mean can be easily used for comparisons.
4. **Statement 1** : Averages cannot help in formulation of policies.
   Statement 2 : In weighted average, items are accorded different weights depending on their relative importance.
5. **Statement 1** : The product of arithmetic mean and the number of items on which mean is based is equal to the sum of all given items.
   Statement 2 : Measures of central tendency refer to all those methods of statistical analysis by which averages of the statistical series are worked out.

SET-5

Choose the Correct Pair of Statements/Identify the Correct Sequence of Alternatives

1. **From the set of statements given in Column I and Column II, choose the correct pair of statements:**

Column I	Column II
A. Assumed mean	(*i*) Always the middle item of the series
B. Simple arithmetic mean	(*ii*) Mean value may not figure in the series at all
C. Deviation	(*iii*) Assumed mean – Actual value in the series
D. Simple arithmetic mean > Weighted arithmetic mean	(*iv*) Larger weights are assigned to larger items

Alternatives:

(*a*) A—(*i*)
(*b*) B—(*ii*)
(*c*) C—(*iii*)
(*d*) D—(*iv*)

2. **Identify the correct sequence of alternatives given in Column II by matching them with respective items in Column I:**

Column I	Column II
A. Assumed Mean method	(*i*) $\overline{X} = A + \frac{\Sigma fd'}{\Sigma f} \times C$
B. Direct method	(*ii*) $\overline{X} = \frac{\overline{X}_1 N_1 + \overline{X}_2 N_2}{N_1 + N_2}$
C. Step-deviation method	(*iii*) $\overline{X} = \frac{\Sigma fm}{\Sigma f}$
D. Combined mean	(*iv*) $\overline{X} = A + \frac{\Sigma fd}{\Sigma f}$

Alternatives:

(*a*) A—(*iv*), B—(*i*), C—(*ii*), D—(*iii*)
(*b*) A—(*i*), B—(*iii*), C—(*iv*), D—(*ii*)
(*c*) A—(*iv*), B—(*iii*), C—(*i*), D—(*ii*)
(*d*) A—(*ii*), B—(*i*), C—(*iv*), D—(*iii*)

SET-6

Assertion and Reasoning

In the following questions (1-5), a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct alternative among those given below:

Alternatives:

(*a*) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)
(*b*) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A)
(*c*) Assertion (A) is true but Reason (R) is false
(*d*) Assertion (A) is false but Reason (R) is true

1. Assertion (A) : Arithmetic mean can easily be used for comparisons.
   Reason (R) : It is a stable and certain value.
2. Assertion (A) : Mean is shown by the following formula:
   $\overline{X} = X_1 + X_2 + \ldots + X_n - N = \Sigma X - N.$
   Reason (R) : The sum of deviations of the items from arithmetic mean is always zero.

3. Assertion (A) : Arithmetic mean of these items: 4, 5, 3, 2, 6, 4 is 4.
Reason (R) : If arithmetic mean of a series is 10 and if 4 is subtracted from all the items of this series, the new arithmetic mean will be 40.

4. Assertion (A) : Central tendency refers to an average or a central value of a statistical series.
Reason (R) : Assumed mean is calculated in short-cut method.

5. Assertion (A) : Percentage or a relative value does not serve as a good average.
Reason (R) : Arithmetic mean is particularly significant in such series of which different items are equally important and therefore, equally weighed.

ANSWERS

SET-1

1. mathematical 2. simple 3. absolute number 4. step-deviation
5. percentage 6. affected 7. sum 8. squared
9. divided 10. relative importance

SET-2

1. (*a*) 2. (*d*) 3. (*d*) 4. (*c*) 5. (*b*) 6. (*c*) 7. (*a*) 8. (*c*) 9. (*c*) 10. (*c*)
11. (*c*) 12. (*c*) 13. (*c*) 14. (*b*) 15. (*b*)

SET-3

1. True 2. True 3. True 4. False 5. True 6. False 7. True 8. False 9. False 10. True

SET-4

1. (*c*) 2. (*a*) 3. (*a*) 4. (*d*) 5. (*a*)

SET-5

1. (*b*) 2. (*c*)

SET-6

1. (*a*) 2. (*d*) 3. (*c*) 4. (*b*) 5. (*b*)