MISCELLANEOUS EXERCISE – 6

1. A grouped frequency table is also called……
(a) data
(b) frequency distribution
(c) frequency polygon
(d) Histogram

2. Mean of a variable with similar observations say constant k is…
(a) negative (b) k itself
(c) zero (d) one

3. A deviation is defined as a difference of any value of the variable from a……
(a) constant (b) histogram
(c) sum (d) frequency

4. Mean is affected by change in…
(a) value (b) ratio
(c) origin (d) none of these

5. Mean is affected by change in…
(a) place (b) scale
(c) rate (d) none of these

6. Arithmetic mean is a measure that determines a value of the variable under study by dividing the sum of all values of the variable by their…
(a) number (b) group
(c) denominator (d) numerator

7. A frequency polygon is a many sided…
(a) closed figure (b) rectangle
(c) square (d) Circles

8. A data in the form of frequency distribution is called……
(a) Grouped data
(b) Ungrouped data
(c) Histogram
(d) Dispersion

9. A histogram is a set of adjacent…
(a) squares (b) rectangles
(c) circles (d) Dots

10. A cumulative frequency table is also called……
(a) frequency distribution
(b) data
(c) less than cumulative frequency distribution
(d) Histogram

11. In a cumulative frequency polygon frequencies are plotted against
(a) midpoints
(b) upper class boundaries
(c) class limits (d) frequencies

12. The measures that are used to determine the degree or extent of variation in a data set are called measures of…….
(a) dispersion
(b) central tendency
(c) average
(d) quartile

13. The positive square root of mean of the squared deviations of x_i (i – 1,2,.... n) observations from their arithmetic mean is called.....
(a) harmonic mean (b) range
(c) S.D (d) variance

14. The value obtained by reciprocating the mean of the reciprocal of $x_1,x_2,x_3..x_n$ observations is called.....
(a) Geometric mean
(b) Median
(c) Harmonic mean
(d) S.D

15. The most frequent occurring observation in a data set is called.....
(a) Mode (b) Median
(c) Harmonic mean
(d) Mean

16. The measure which determines the middlemost observation in a data set is called.....
(a) median (b) mode
(c) mean (d) variance

17. The size of class interval (6–10) is.
(a) 4 (b) 5
(c) 8 (d) 10

18. The arrangement of data is necessary to find the value of.
(a) Mean (b) Median
(c) Mode (d) Range

19. Sum of the deviations of the variable x from its mean is always.....
(a) zero (b) one
(c) same (d) negative

20. The extent of variation between two extreme observations of a data set is measured by.....
(a) average (b) range
(c) quartiles (d) mode

21. The mean of the squared deviations of x_i (i = 1, 2.....,n) observations from their arithmetic mean is called...
(a) variance
(b) standard deviation
(c) range (d) mode

22. The n^{th} positive root of the product of the $x_1,x_2,x_3,.....x_n$ observations is called.....
(a) Mode (b) Mean
(c) Geometric mean
(d) median

23. The observation that divide a data set into four equal part, are called
(a) deciles (b) quartiles
(c) percentiles (d) mode

24. The spread or scatterness of observations in a data set is called .....
(a) average
(b) dispersion
(c) central tendency
(d) quartile

25. The class having maximum frequency is called .....class.
(a) Modal (b) Median
(c) Lower (d) Upper

26. The class containing $\frac{n}{2}$th observation is called.
(a) Modal (b) Median
(c) Boundary of (d) Size of

27. During frequency distribution number of groups should be between....
(a) 5 and 10 (b) 10 and 15
(c) 10 and 20 (d) 5 and 15

28. Direct formula to find mean from ungrouped data.
(a) $\overline{X}=\frac{\sum x}{n}$
(b) $\overline{X}=\frac{\sum fx}{\sum f}$
(c) $\overline{X}=A+\frac{\sum D}{n}$
(d) $\overline{X}=A+\frac{\sum fD}{\sum f}$

29. Formula to find Harmonic mean from grouped data is.....
(a) $\overline{X}=\frac{n}{\sum \frac{1}{x}}$

(b) $\bar{X}=\frac{n}{\sum\frac{f}{x}}$

(c) $\bar{X}=A+\frac{\sum fu}{n}\times h$

(d) $\bar{X}=A+\frac{\sum fu}{\sum f}\times h$

30. Variance is denoted by.....

(a) V (b) S

(c) S^2 (d) $\bar{X}$

31. Short formula to find mean from grouped data is.....

(a) $\bar{X}=\frac{\sum x}{n}$ (b) $\bar{X}=\frac{\sum fx}{\sum f}$

(c) $\bar{X}=A+\frac{\sum D}{n}$ (d) $\bar{X}=A+\frac{\sum fD}{\sum f}$

32. In class (30–39), lower class limit is.....

(a) 39 (b) 9

(c) 30 (d) 34.5

33. Coding formula to find mean from grouped data is.....

(a) $\bar{X}=\frac{n}{\sum\frac{1}{x}}$

(b) $\bar{X}=\frac{n}{\sum\frac{f}{x}}$

(c) $\bar{X}=A+\frac{\sum u}{n}\times h$

(d) $\bar{X}=A+\frac{\sum fu}{\sum f}\times h$

34. Formula to find Harmonic mean from ungrouped data is.....

(a) $\bar{X}=\frac{n}{\sum\frac{1}{x}}$

(b) $\bar{X}=\frac{n}{\sum\frac{f}{x}}$

(c) $\bar{X}=A+\frac{\sum fu}{n}\times h$

(d) $\bar{X}=A+\frac{\sum fu}{\sum f}\times h$

35. Direct formula to find mean from grouped data is.....

(a) $\bar{X}=\frac{\sum x}{n}$ (b) $\bar{X}=\frac{\sum fx}{\sum f}$

(c) $\bar{X}=A+\frac{\sum D}{n}$ (d) $\bar{X}=A+\frac{\sum fD}{\sum f}$

36. The concept of antilogarithm is used to find the value of.....

(a) A.M (b) G. M

(c) H. M (d) Mode

37. Short formula to find mean from ungrouped data is.....

(a) $\bar{X}=\frac{\sum x}{n}$ (b) $\bar{X}=\frac{\sum fx}{\sum f}$

(c) $\bar{X}=A+\frac{\sum D}{n}$ (d) $\bar{X}=A+\frac{\sum fD}{\sum f}$

38. In class (20–29), Midpoint or class mark is.....

(a) 20.5 (b) 24.5

(c) 29 (d) 49

39. Median from the data 82,93,86,92 and 79 is.....

(a) 82 (b) 86

(c) 92 (d) 93

40. Harmonic mean for 12,5,8,4 is...

(a) 6.08 (b) 5.08

(c) 7.08 (d) 4.08

41. Geometric Mean of 2,4,8 is.....

(a) 2 (b) 4

(c) 8 (d) 3

42. Coding formula to find mean from ungrouped data is.....

(a) $\bar{X}=\frac{n}{\sum\frac{1}{x}}$

(b) $\overline{X}=\frac{n}{\sum\frac{f}{x}}$

(c) $\overline{X}=A+\frac{\sum u}{n}\times h$

(d) $\overline{X}=A+\frac{\sum fu}{\sum f}\times h$

43. Standard deviation is denoted by.....

(a) $\tilde{X}$ (b) S

(c) S^2 (d) $\overline{X}$

44. Types of measures of central tendency are.....

(a) 3 (b) 4

(c) 5 (d) 6

45. Median is denoted by.....

(a) $\overline{X}$ (b) $\tilde{X}$

(c) S (d) S^2

46. If y = 10X then $\overline{y}$=.....

(a) 10 (b) $10\overline{X}$

(c) $\overline{X}$ (d) $10+\overline{X}$

47. If Y = X + 5 then $\overline{Y}$ =

(a) $\overline{X}$ (b) 5

(c) $\overline{X}+5$ (d) $5\overline{X}$

48. In class (10 – 19), upper class limit is.....

(a) 10 (b) 19

(c) 29 (d) 14.5

49. On the basis of types of variable or data, the types of frequency distribution are.

(a) 2 (b) 3

(c) 4 (d) 5

50. Types of dispersion are.....

(a) 4 (b) 5

(c) 6 (d) 3

51. Range for the data 110, 109, 84, 89, 77, 104, 74, 97, 49, 59, 103, 62 is.....

(a) 41 (b) 51

(c) 61 (d) 71

52. If standard deviation is 6 then its variance is.....

(a) $\sqrt{6}$ (b) 36

(c) 3 (d) 6

53. $\sum(X-\overline{X})$ = ...

(a) 0 (b) 1

(c) –1 (d) 2

54. Arithmetic mean of 34,34,34,34,34,34 is

(a) 0 (b) 34

(c) 6 (d) 170

55. Mode from the following data 4,4,5,5,6,6,6,7,7,5,8,8,8,6,5,6,5,7 is.....

(a) 4 (b) 5

(c) 5, 6 (d) 5, 7

56. Median from the data 2.3, 2.7, 2.5, 3.1 and 1.9 is.....

(a) 2.3 (b) 2.5

(c) 2.7 (d) 2.9

57. Which one is formula for weighted Arithmetic mean?

(a) $\frac{\sum w}{\sum wx}$ (b) $\sum wx$

(c) $\sum x$ (d) $\frac{\sum wx}{\sum w}$

58. Range = ...

(a) $X_m + X_o$ (b) $X_m - X_o$

(c) $\frac{X_m}{X_o}$ (d) $\frac{X_o}{X_m}$

ANSWER KEY

1.	b	**2.**	b	**3.**	a	**4.**	c	**5.**	b
6.	a	**7.**	a	**8.**	a	**9.**	b	**10.**	c
11.	b	**12.**	a	**13.**	c	**14.**	c	**15.**	a
16.	a	**17.**	b	**18.**	b	**19.**	a	**20.**	b
21.	a	**22.**	c	**23**	b	**24**	b	**25**	a
26	b	**27**	d	**28**	a	**29**	b	**30**	c
31	d	**32**	c	**33**	d	**34**	a	**35**	b
36	b	**37**	c	**38**	b	**39**	b	**40**	a
41	b	**42**	c	**43**	b	**44**	c	**45**	b
46	b	**47**	c	**48**	b	**49**	a	**50**	b
51	c	**52**	b	**53**	a	**54**	b	**55**	c
56	b	**57**	d	**58**	b				

Q. 2 Write short answer of the following questions.

(i) Define class limits.

Class Limits: The minimum and the maximum values defined for a class or group are called class limits. The minimum value is called the lower class limit and the maximum value is called the upper class limit of that class. For example in the group (5–10), 5 is lower class limit and 10 is called upper class limit.

(ii) Define class mark

Midpoint or Class Mark:

For a given class the average of that class obtained by dividing the sum of upper and lower class limits by 2, is called the midpoint or class mark of that class

(iii) What is cumulative frequency?

Cumulative Frequency: The total of frequency up to an upper class limit or boundary is called the cumulative frequency.

(iv) Define a frequency distribution.

Frequency Distribution

A frequency distribution is a tabular arrangement for classifying data into different groups and the number of observation falling in each group corresponds to the respective group. In fact a frequency distribution is a method to summarize data.

(v) What is Histogram?

Histogram

A Histogram is a graph of adjacent rectangles constructed on XY–plane. It is a graph of frequency distribution. In practice both discrete and continuous frequency distribution are represented by means of histogram.

(vi) Name two measures of central tendency.

1– Arithmetic Mean 2– Median 3– Mode

(vii) Define Arithmetic mean?

i. Arithmetic Mean:

Arithmetic mean is a measure that determines a value of the variable under study by dividing the sum of all values (observations) of the variable by their number of observations. We denote Arithmetic mean by $\overline{X}$. In symbols we define.

Arithmetic mean of n observations

$$\overline{X}=\frac{\sum X}{n}=\frac{\text{Sum of all values of observations}}{\text{No. of observations}}$$

(viii) Write three properties of Arithmetic mean.

Properties of Arithmetic Mean:

Following are the properties of Arithmetic Mean.

(a) Mean of a variable with similar observations say constant k is the constant k itself.

(b) Mean is affected by change in origin.

(c) Mean is affected by change in scale.

(d) Sum of the deviations of the variable X from its mean is always zero.

(ix) Define Median.

Median:

Median is the middle most observations in an arranged data set. It divides the data set into two equal parts. $\tilde{x}$ is used to represent median. We determine Median by using the following formulae.

Median From Ungrouped Data

Case 1:

When the number of observations (n) is odd.

$$\tilde{x}=\left(\frac{n+1}{2}\right)\text{th term in arranged data}$$

Case 2:

When the number of observations (n) is even.

$$\tilde{x}=\frac{1}{2}\left[\frac{n}{2}\text{th term}+\frac{n+2}{2}\text{th term}\right]$$

(x) Define mode.

Mode:

Mode is defined as the most frequent occurring observation is the data. It is the observation that occurs maximum number of times in given data. The following formula is used to determine Mode.

(i)Ungrouped Data and Discrete Grouped Data

Mode = The Most frequent observation

(ii) Grouped Data (Continuous)

The following Formulae are used to determine mode for grouped data.

$$\text{Mode} = l + \frac{f_m - f_1}{2f_m - f_1 - f_2} \times h$$

(xi) What do you mean by Harmonic mean?

Harmonic Mean:

Harmonic mean refers to the value obtained by reciprocating the mean of the reciprocal of $x_1, x_2, x_3, \ldots\ldots, x_n$ observations. In symbols,

- **For Ungrouped data.**

$$H.M = \frac{n}{\sum \frac{1}{X}}$$

- **For Grouped data.**

$$H.M = \frac{n}{\sum \frac{f}{X}}$$

(xii) Define Geometric mean.

Geometric Mean:

Geometric mean of a variable x is the n^{th} positive root of the product of the $x_1, x_2, x_3, \ldots\ldots\ldots\ldots, x_n$ observation. In symbols we write,

$$G.M = (X_1 . X_2 . X_3 . \ldots\ldots . X_n)^{1/n}$$

The Geometric mean can also be calculated by using logarithm.

- **For Ungrouped data:**

$$\text{G.M} = \text{Anti log}\left(\frac{\sum \log X}{n}\right)$$

- **For Grouped data:**

$$\text{G.M} = \text{Anti log}\left(\frac{\sum f \log X}{\sum f}\right)$$

(xiii) What is Range?

Range:

Range measures the extent of variation between two extreme observations of a data set. It is given by the formula.

Range = $X_{max} - X_{min} = X_m - X_o$ Where,

$X_{max} = X_m$: the maximum observation.

$X_{min} = X_o$: the minimum observation.

(xiv) Define Standard deviation?

Standard Deviation:

Standard deviation is defined as the positive square root of mean of the squared deviations of Xi, (i = 1,2,3….., n) observations from their arithmetic mean.

- **Standard Deviation from Un–Grouped Data**

Definitional Formula

$$\text{S. D(X)} = S = \sqrt{\frac{\sum (X - \overline{X})^2}{n}}$$

Computational Formula

$$\text{S. D (X)} = S^2 = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2}$$

- **Standard Deviation from Grouped Data**

Definitional Formula

$$\text{S.D (X)} = \text{S} = \sqrt{\frac{\sum f(X - \overline{X})^2}{\sum f}}$$

Computational Formula

$$\text{S.D (X)} = \text{S} = \sqrt{\frac{\sum fX^2}{\sum f} - \left(\frac{\sum fX}{\sum f}\right)^2}$$