

Emporium Competitive Objective Series

STATISTICS

MCQ'S

For

- NTS / ETEA
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- Lecturer's Test
- Subject Specialist
- Statistical Officers
- C.S.S / P.M.S
- M.A / M.Sc (Statistics & Economics)
- I.C.S / B.C.S &

All Other Competitive Exams



By

A Board of Senior Professors



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CONTENTS

Ch. #	Subject / Topics	Page #
1.	Introduction to Statistics	1
2.	Presentation of Data	19
3.	Measures of Location	43
4.	Measures of Dispersion	59
5.	Index Number	79
6.	Probability	93
7.	Random Variable and Probability Distributions	111
8.	Binomial and Hypergeometric Probability Distribution	123
9.	Normal Distribution	145
10.	Sampling and Sampling Distribution	160
11.	Statistical Inference and Estimation	179
12.	Hypothesis Testing	200
13.	Simple Linear Regression and Correlation	217
14.	Association	230
15.	Analysis of Time Series	238
16.	Orientation of Computer	255
	Glossary	265

Chapter 1

INTRODUCTION TO STATISTICS

SELECT THE APPROPRIATE ANSWER:

1. In the plural sense, statistic means ____
 - (a) Methods
 - (b) Data
 - (c) Science
 - (d) Meteorology

2. Statistics Laws are true ____
 - (a) In each case
 - (b) Average
 - (c) Facts
 - (d) Field

3. Statistics are ____ expressed.
 - (a) Descriptive
 - (b) Ability
 - (c) Qualitatively
 - (d) Quantitatively

4. ____ is the oldest field of statistical study.
 - (a) Kit of tools
 - (b) Astronomy
 - (c) Useless
 - (d) Mathematics

5. Most of the recent developments in statistics arose to meet the needs of _____
 (a) Biology (b) Three reasons
 (c) Hands (d) Physics
6. _____ used the word statistics for the first time during one of his lectures at a German university.
 (a) Fisher (b) unavoidable
 (c) Feet (d) Achenwall
7. _____ statistics deals with collection, presentation and analysis of data.
 (a) Inferential (b) Descriptive
 (c) Collection (d) Two
8. The word statistics is defined as:
 (a) Singular Sense
 (b) Plural Sense
 (c) Singular as well as plural sense
 (d) Non of these
9. The data collected by NADRA to issue National Identity cards are
 (a) Official data (b) un-official data
 (c) Primary data (d) Secondary data
10. Statistics is the backbone of
 (a) Economics (b) Mathematics
 (c) Computer (d) Research
11. A characteristics that does not change is called
 (a) Variable (b) Attribute
 (c) Constant (d) None of these
12. Statistics are the _____ of administration.
 (a) Eyes (b) Feet
 (c) Data (d) Hands
13. The word statistics is at present used in _____
 (a) Two ways (b) Four ways
 (c) Six ways (d) Three way
14. Use of statistics in planning is _____
 (a) Useless (b) Various Methods
 (c) Unavoidable (d) Samples
15. Statistical Laws are valid in the _____
 (a) Long run (b) Plural sense
 (c) Indefinite (d) Short run
16. Statistics tests the law of _____
 (a) Other sciences (b) Physics
 (c) Business (d) Literary subjects.
17. In natural Sciences, statistics _____
 (a) Has no role (b) Average
 (c) Plays an Important role (d) Study
18. Statistical methods are like _____
 (a) Reasons (b) Efficient
 (c) Limitations (d) Kit of tools

19. Village Patwari collecting the data about cotton crops is the example of
 (a) Variable (b) Constant
 (c) Primary data (d) Secondary data
20. Statistics laws are true for
 (a) Short run (b) Long run
 (c) Medium period (d) None of these
21. A numerical value calculated from sample is called.
 (a) Mathematics (b) Economics
 (c) Statistics (d) None of these
22. Statistics has handicap dealing with
 (a) Constant (b) Variable
 (c) Quantitative data (d) Qualitative data
23. Major area of statistics today is concerned with drawing of conclusions from _____
 (a) Samples (b) Primary
 (c) Two (d) Complete study
24. Dependence of difference on statistics is for _____
 (a) Two reasons (b) Short run
 (c) Three reasons (d) Natural sciences
25. Data being used by an agency which is originally collected by them are _____ data.
 (a) Quantitative (b) Primary
 (c) Discrete (d) Secondary

26. Data of population Census reports are _____ data.
 (a) Continuous (b) Secondary
 (c) Discrete (d) Primary
27. Usually measurements give rise to _____ data.
 (a) Discrete (b) Specific
 (c) Continuous (d) Constant
28. A Constant can assume _____ value.
 (a) One (b) Four
 (c) More than one (d) Resident }
29. The number of road accidents is the example of
 (a) Variable (b) Constant
 (c) Discrete variable (d) Continuous variable
30. Continuous variables can assume _____ value.
 (a) All possible (b) Constant
 (c) Accuracy (d) Specific
31. Data regarding opinions of consumers about some product obtained through lady workers are _____
 (a) Cheapest method (b) Existing sources
 (c) Primary (d) Secondary
32. _____ data are collected for the first time.
 (a) Research (b) Statistical
 (c) Secondary (d) Primary

33. Data published by Bureau of statistics in its publications are _____
 (a) Secondary data (b) Discrete data
 (c) Continuous data (d) None
34. $f_1x_1^2 + f_2x_2^2 + \dots + f_nx_n^2 = \underline{\hspace{2cm}}$
 (a) $\sum_{i=1}^n f_i x_i^2$ (b) $\sum_{i=1}^n f_i x_i^2$
 (c) $\sum_{i=1}^n f_i x_i^2$ (d) $\sum_{i=1}^n f_i x_i^2$
35. Age of a shopkeeper is the example of
 (a) Qualitative data (b) Quantitative data
 (c) Variable data (d) Continuous data
36. Identify the attribute
 (a) Blood group (b)
 (b) Blood pressure (c)
 (c) Temperature of room (d)
 (d) Religions of people of a country
37. Proportion becomes percentage when multiplied by
 (a) $\frac{1}{10}$ (b) $\frac{1}{100}$
 (c) $\frac{1}{100}$ (d) 100
38. Eye color of employees is the example of
 (a) Continuous variable (b) Constant variable
 (c) Discrete variable (d) Attribute
39. Results obtained by counting are
 (a) Continuous (b) Discrete
 (c) Both (a) and (b) (d) None of these
40. Marital status of an individual is the example of
 (a) Attribute (b) Discrete variable
 (c) Continuous variable (d) Constant
41. Making a entrance slip in service hospital is the method of collection of data by
 (a) Registration (b) Entry
 (c) Correspondents (d) None of above
42. Which branch of statistics deals with the techniques that are used to organize, summarize, and present the data?
 (a) Advanced Statistics (b) Descriptive
 (c) Inferential Statistics (d) Bayesian Statistics
43. In descriptive statistics, we study
 (a) The description of decision making process
 (b) The methods for organizing, displaying, and describing data.
 (c) How to describe the probability distribution
 (d) None of the above
44. You asked five of your classmates about their height. On the basis of this information, you stated that the average height of all students in your university or college is 67 inches. This is an example of:
 (a) Descriptive statistics (b) Inferential Statistics
 (c) Parameter (d) Population

QUESTIONS & ANSWERS

- Q. Define statistics.**
- Ans. The term "statistics" refers to a "statistical measure calculates from a representative sample of data relating to a phenomenon or a problem. Averages. Percentages. etc, are all statistically measure. each of term id called a "statistics".
- Q. What is statistical data?**
- Ans. Statistical data collection is the operation of statistical data processing the input object data of a statistical survey.
- Q. What is descriptive statistics?**
- Ans. The branch of statistics that deals with collection of data presentation and analysis of numerical data is called descriptive statistics.
- Q. What is applied statistics?**
- Ans. Applied statistics deals with the application of statistical methods to concrete subjects matter, such as measurement of economic, commercial, social, agricultural, industrial scientific and mental phenomena, measurement of living organisms, study of vital and population movements and actuarial principles.

1. (a)	2. (b)	3. (d)	4. (b)	5. (a)	6. (d)	7. (b)	8. (c)	
9. (c)	10. (d)	11. (e)	12. (a)	13. (d)	14. (c)	15. (a)	16. (a)	
17. (c)	18. (d)	19. (e)	20. (b)	21. (e)	22. (d)	23. (a)	24. (c)	
25. (b)	26. (d)	27. (c)	28. (a)	29. (c)	30. (a)	31. (b)	32. (d)	
33. (d)	34. (a)	35. (d)	36. (d)	37. (d)	38. (d)	39. (b)	40. (a)	
41. (a)	42. (b)	43. (b)	44. (b)	45. (b)	46. (e)	47. (b)		

ANSWERS

45. In statistics, a sample means
 (a) A portion of the sample
 (b) A portion of the population
 (c) All the items under investigation
 (d) None of the above
46. Which of the following is not based on all the observations?
 (a) Arithmetic Mean
 (b) Geometric Mean
 (c) Harmonic Mean
 (d) Weighted Mean
 (e) Mode
47. Life of a TV picture tube is a:
 (a) Discrete variable
 (b) Continuous variable
 (c) Qualitative variable
 (d) Constant

Chapter 2

PRESENTATION OF DATA

SELECT APPROPRIATE ANSWER:

1. A frequent distribution in which class interval size is not the same is called frequency distribution with _____ class interval size.
(a) Open-end (b) Distribution
(c) Component (d) Unequal

2. Data which have been arranged in ascending or descending order is called _____ data.
(a) Grouped data (b) Classify
(c) Array (d) ungrouped data

3. Data which is not arranged in ascending or descending order is called _____
(a) Raw (b) Cumulative frequency
(c) Grouped (d) Arrangement

4. Class Interval size is the difference between the upper and lower class _____ of a class.
(a) Boundary (b) Limits

5. When we add the lower and upper class limits and dividing the sum by, the values so obtained are called class _____
- Interval
 - Histogram
 - Limits
 - Marks
6. The process of systematic arrangement of data into rows and columns is called _____
- Bar chart
 - Classification
 - Tabulation
 - None of these
7. In a table, foot note and source notes are _____
- Same
 - Different
 - Identical
 - Non-identical
8. The smallest and the largest values of any given class of a frequency distribution are called _____
- Class marks
 - Class interval
 - Mid point
 - Class limit
9. A graph of cumulative frequency distribution is called _____
- Histogram
 - Frequency polygon
 - Ogive
 - None of above
10. If we connect the mid points of rectangles in a histogram with a series of lines, we get _____
- Mid point
 - Interval
11. In an open end frequency distribution either the _____ class limit.
- First
 - Second
 - Last
 - Middle
12. Cumulative frequency is the frequency _____ than the upper class boundary of a class.
- Distribution
 - Curve
 - Greater
 - Less
13. The relation showing between whole and its components used chart is said to be _____
- Component bar chart
 - Multiple bar chart
 - Pie chart
 - Simple Bar chart
14. A graph consists of _____ lines
- Parallel line
 - Smooth curve
 - Curve
 - Straight
15. A value get which divides a class into two equal parts is called _____
- Class interval
 - Open interval
 - Size
 - Mid point
16. Range is the difference between largest and _____
- Lowest
 - Smallest
 - Biggest
 - Middlest

17. We get _____ dividing range by numbers of class interval.
- Class boundary
 - Class marks
 - Mid points
 - Numbers of classes
18. Data which have not been arranged in systematic order is called _____
- Group data
 - Tabular data
 - Raw data
 - Undefined data
19. In constructing a histogram which is to be taken along X-axis _____
- Class interval
 - Class frequency
 - Class boundaries
 - Class mark
20. Frequency table is an arrangement of data by classes together with their _____ class frequencies.
- Terms
 - Alternate class
 - Same class
 - Corresponding class
21. Data arranging into rows and columns are called _____
- Frequency distribution
 - Classification
 - Table
 - Tabulation
22. Data classified by many _____ said to be quantitative.
- Characteristics
 - Affinities
 - Categories
 - Attributes
23. A _____ is a heading at the top of the table describing its contents.
- Footnote
 - Head note
 - Sub note
 - Title
24. The headings for various columns are said to be _____
- Portions of column
 - Vertical column
 - Column table
 - Column caption
25. The stub is the containing _____
- Box head
 - Column captions
 - Caption
 - Row caption
26. _____ are used to represent data classified on qualitative
- Vertical bars
 - Simple bar
 - Horizontal bars
 - Pie chart
27. There are _____ important bases of classification of data.
- Two
 - Four
 - Six
 - Three
28. The difference between the upper and lower class boundaries of a class are known as _____
- Class interval
 - Class mark
 - Class frequency
 - Mid point

29. A table has at least _____ part.
 (a) Two
 (b) Three
 (c) Four
 (d) Five
30. A source note and foot are the _____
 (a) Top
 (b) Bottom
 (c) Same
 (d) Different
31. A time series is an arrangement of data according to _____
 (a) Place
 (b) Yearly
 (c) Time
 (d) None
32. Data classified by methods are called _____ data.
 (a) Row data
 (b) Grouped data
 (c) Quantitative data
 (d) Geographical
 (e) None of these
33. Technical & Trade Journals are the sources of _____ data.
 (a) Primary
 (b) Secondary
 (c) Ungroup data
 (d) Group data
34. Any data collected by the investigator personally from the informants are called _____ data.
 (a) Primary
 (b) Unofficial
 (c) Group data
 (d) None of these
35. Class _____ is the difference between two class limit.
 (a) Boundary
 (b) Class mark
 (c) None of these
 (d) Class interval
36. Class mark is the value which divides a class into _____ equal parts.
 (a) Four
 (b) One
 (c) Three
 (d) Two
37. There are _____ important bases of classification.
 (a) Two
 (b) Four
 (c) Three
 (d) Five
38. The lower class boundary of 25 - 35 will be _____
 (a) 20
 (b) 25
 (c) 30
 (d) 35
39. The process of systematic arrangement of data in rows and columns is called _____
 (a) Classification
 (b) Tabulation
 (c) Frequency
 (d) Frequency distribution
40. The graph obtained by joining the mid points of the tops of adjacent rectangles in histogram is called _____
 (a) Frequency polygon
 (b) Ogive
 (c) Pie chart
 (d) Histogram

41. The class _____ are obtained when we divide the sum of the lower and upper class limits by 2.
- Limit
 - Points
 - Marks
 - Class boundary
42. When in a frequency distribution the maximum frequencies occur at one end, then the frequency curve of such distribution is _____
- J-shaped
 - U-shaped
 - Bell-shaped
 - V-shaped
43. Cumulative frequencies are _____
- Increasing
 - Non-increasing
 - Decreasing
 - None of these
44. _____ paper is needed to show the graphs of frequency distribution.
- Ordinary
 - Graph
 - Photo
 - Chart
45. In pie-chart, the arrangement of the angles of the different sectors is generally _____
- Anti-clockwise
 - Arrayed
 - Clock-wise
 - Alternative
46. For a given class 30 – 44 the midpoint will be _____
- 30
 - 34
 - 37
 - 35

48.

use the division of a circle into different sectors

(a) Frequency Polygon

(b) Conversion Graphs

(c) Sector Graph

(d) Line Graph

ANSWERS

1. (d)	2. (c)	3. (a)	4. (a)	5. (d)	6. (c)	7. (b)	8. (d)
9. (c)	10.(d)	11.(a)	12.(d)	13.(c)	14.(d)	15.(d)	16.(b)
17.(d)	18.(c)	19.(c)	20.(d)	21.(d)	22.(d)	23.(c)	24.(d)
25.(d)	26.(c)	27.(c)	28.(a)	29.(c)	30.(d)	31.(c)	32.(e)
33.(b)	34.(a)	35.(d)	36.(d)	37.(b)	38.(b)	39.(b)	40.(a)
41.(c)	42.(a)	43.(a)	44.(a)	45.(c)	46.(c)	47.(c)	48.(c)

42

$$\text{Mid Point} = \frac{\text{Lower Class limit} + \text{Upper Class limit}}{2}$$

or

$$\text{Mid Point} = \frac{\text{Lower C.B} + \text{Upper C.B}}{2}$$

Chapter 3

MEASURES OF LOCATION

$$\text{Relative frequency} = r.f. = \frac{f}{\Sigma f} = \frac{\text{Respective Frequency}}{\text{Total Frequency}}$$

SELECT THE APPROPRIATE ANSWER:

1. Average is called _____ because they help to locate the center of data.
 (a) Average
 (b) Mode
 (c) Median
 (d) Central tendency
2. _____ value obtained by dividing the sum of value by their number.
 (a) Mode
 (b) Median
 (c) Zero
 (d) Mean
3. Arithmetic mean is _____ by change of origin and scale of measurement.
 (a) Vary
 (b) Negative
 (c) Affected
 (d) Not affected
4. Sum of square of deviations from _____ is least.
 (a) Mean
 (b) Assume of mean
 (c) Median
 (d) Mode

5. The arithmetic mean _____ by 10 if 10 is added to its values.

- (a) Decrease (b) Smaller
- (c) Largest (d) Increase

6. Sum of deviation from mean is _____

- (a) Negative (b) Zero
- (c) Positive (d) Identical

7. We must arrange the data before calculating _____

- (a) Mean (b) Median
- (c) Mode (d) G.M.

8. A major disadvantage of mean is that it is affected by extremely _____ values.

- (a) Small (b) Larger
- (c) Increase (d) Mean

9. The most frequent value in data is called _____

- (a) Mean (b) Mode
- (c) Median (d) H.M.

10. Mode is the value that occurs _____ number of times in a sequence of objects.

- (a) More (b) Large
- (c) Less (d) Times

11. H.M. _____ G.M. _____ A.M.

- (a) < (b) ≥
- (c) ≤ (d) >

12. Median is defined as the value in a distribution below and about which _____ of value i.e.

- (a) Tend (b) Center
- (c) Greater (d) Smaller

13. The sum of square of deviation is least when measured from _____

- (a) Arbitrary value (b) Mean
- (c) Mode (d) G.M.

14. Suitable average for averaging the shoe size for children is _____

- (a) Mean (b) Mode
- (c) Median (d) G.M.

15. If the smallest observation in a data is decreased, the average which is not affected is _____

- (a) G.M. (b) Median
- (c) Mean (d) Harmonic mean

16. The distribution will be _____ when mean, median, and mode are equal.

- (a) Normal (b) Positive
- (c) Same (d) None

17. Median = Q² = D⁵ = _____

- (a) P₂₅ (b) P₅₀
- (c) P₇₅ (d) P₅₀

18. Harmonic mean cannot be calculated if any one of the values in the data is —

- (a) Zero
- (b) Negative
- (c) Positive
- (d) All sign

19. — deviations taken from A.M. is always equal to zero.

- (a) Mean
- (b) Sum
- (c) Average
- (d) 2.D.

20. Median is always central value even if the data is

- (a) Unassigned
- (b) Arranged
- (c) Continuous
- (d) Discrete

21. Mean is relatively — measure.

- (a) Stable
- (b) Manipulation
- (c) Change
- (d) Group

22. G.M. of 2, 4, 8 is —

- (a) 6
- (b) 4
- (c) $\frac{14}{3}$
- (d) 8

23. Third quartile = $Q_3 = \frac{P_{33}}{D^3}$

- (a) Median
- (b) D³
- (c) None of these

24. Average is good if it is easy to —

- (a) Change
- (b) Capable
- (c) Understand
- (d) Clear

25. In moderately skewed distribution if —

- (a) Mode = 3 median - 2 mean
- (b) Mode = 2 median - 3 mean
- (c) Median = 2 median - 3 mean
- (d) Mean - mode

26. Quartiles, deciles are located from an ogive in a way

- (a) Mode
- (b) G.M.
- (c) Median
- (d) Qualities

27. Deciles means are $(\frac{1}{10})$

- (a) 100
- (b) 10
- (c) 1000
- (d) 10000

28. Percentile means are $(\frac{1}{n})$

- (a) 1000
- (b) 10
- (c) 100
- (d) 10000

29. G.M. are set of 'n' values product of the nth roots of the —

- (a) Given value
- (b) All +ve, -ve value
- (c) Zero reject
- (d) None of these

30. If any value in the data is zero, then which of the following average vanishes —

- (a) A.M.
- (b) G.M.
- (c) H.M.
- (d) None of these

31. If any value in the data is negative, then it is _____
impossible to calculate _____
- A.M.
 - Mode
 - H.M.
 - G.M.
32. Group data formula for mode _____
- $1 + \frac{f_m - f_2}{f_1 - f_2} \times h$
 - $1 + \frac{f_1 - f_2}{f_2 - f_m} \times h$
 - $1 + \frac{f_m - f_1}{(f_m - f_1) + (f_{m1} - f_2)} \times h$
 - $1 + \frac{f_{m1} - f_2}{f_1 - f_m} \times h$
33. Median = $Q_2 = \underline{\hspace{2cm}}$
- P_2
 - P_{20}
 - P_3
 - None of these
34. The sum of deviations of observations is zero, when deviations are taken from _____
- Mean
 - Median
 - Mode
 - None of these
35. If any value in the data is zero, then it is not possible to have _____
- A.M.
 - Median
 - Mode
 - H.M.
36. If any value in the data is zero, then which of the following average vanishes _____
- A.M.
 - G.M.
 - Mode
 - None of these
37. Coded method of calculation is only used in _____
- Median
 - Combined mean
 - A.M.
 - None of these
38. Which of the following is not based upon all the observations _____
- A.M.
 - G.M.
 - H.M.
 - Mode
39. The arithmetic mean of 10, 8, 6, 4 and 2 is _____
- 5
 - 15
 - 6
 - 30
40. The median of the data 2, 4, 10, 8, 6 is _____
- 6
 - 5
 - 10
 - None of these
41. The mode of the data 2, 4, 6, 6, 6, 8 is _____
- 4
 - 6
 - 8
 - 30
42. The mean of 5, 5, 5, 5, 5, is _____
- 1
 - 5
 - 6
 - 10
43. We must arrange the data before calculating _____
- Mean
 - Median
 - Mode
 - G.M.

44. The most frequent value of the data if it exists is _____
 called _____
 (a) Median
 (b) Quartiles
 (c) Mode
 (d) Deciles
45. Sum of obsolete deviations from _____ is least
 (a) Mean
 (b) Median
 (c) Harmonic
 (d) Mode
46. The median of F, K, E, Q, U, E, N, C, Y is _____
 (a) EUP
 (b) LEY
 (c) EUQ
 (d) EFP
47. The Harmonic Mean of two number is 'a' and 'b' is given by _____
 (a) $\frac{a+b}{2}$
 (b) $\frac{2ab}{a+b}$
 (c) \sqrt{ab}
 (d) None of these
48. A distribution is called _____ distribution if it has two modes.
 (a) Uni-modal
 (b) Bi-modal
 (c) Tri-modal
 (d) None of these
49. Median is _____ than mean is a positive skewed distribution.
 (a) Great
 (b) lesser
 (c) Equal
 (d) None of these

50. The median of numbers, $1^2, 2^2, 3^2, \dots, (2n+1)^2$ is given by _____
 (a) $(n^2 + 1)$
 (b) $(2n + 1)^2$
 (c) $(n + 1)^2$
 (d) $(N - 1)^2$
51. Volume of scale shoes or ready made garments are _____
 (a) Median
 (b) G.M.
 (c) Mode
 (d) H.M.
52. Combine mean calculated by different given mean is _____
 (a) $\frac{n_1x_1 + n_2x_2 + \dots + n_ux_u}{n_1 + n_2 + \dots + n_u}$
 (b) $\frac{n_1x_1 + n_2x_2 + \dots + n_ux_u}{x_1 + x_2 + \dots + x_u}$
 (c) $\frac{n_1x_1 + n_2x_2 + \dots + n_ux_u}{n_1 + n_2 + \dots + n_u}$
 (d) $\frac{\sum n_i x_i}{x_1}$
53. For a certain distribution if $\sum(x - 10) = 5$, $\sum(x - 20) = 18$ and $\sum(x - 20) = 0$ then mean is _____
 (a) 40
 (b) 60
 (c) 45
 (d) 15

ANSWERS

1. (d)	2. (d)	3. (c)	4. (a)	5. (d)	6. (b)	7. (b)	8. (c)
9. (b)	10.(a)	11.(a)	12.(a)	13.(b)	14.(b)	15.(b)	16.(a)
17.(c)	18.(a)	19.(b)	20.(b)	21.(a)	22.(b)	23.(d)	24.(c)
25.(a)	26.(d)	27.(b)	28.(c)	29.(a)	30.(d)	31(d)	32.(c)

33.(b)	34.(a)	35.(d)	36.(b)	37.(c)	38.(d)	39.(c)	40.(a)
41.(b)	42.(b)	43.(b)	44.(c)	45.(b)	46.(c)	47.(b)	48.(b)
49.(b)	50.(c)	51.(c)	52.(c)	53.(c)			

QUESTIONS & ANSWERS

Q. Define average.

Ans. In statistics, an average is defined as the number that

measures the central tendency of a given set of numbers. There are a number of different averages including but not limited to: mean, median, mode and range.

Q. Define central tendency.

Ans. Central tendency is defined as "the statistical measure that identifies a single value as representative of an entire distribution." It aims to provide an accurate description of the entire data. It is the single value that is most typical/representative of the collected data. The term "number crunching" is used to illustrate this aspect of data description. The mean, median and mode are the three commonly used measures of central tendency.

Q. Define A.M.

Ans. Arithmetic mean (or, simply, "mean") is nothing but the average. It is computed by adding all the values in the data set divided by the number of observations.

Q. Define Mode.

Ans. A value of data are mode, which are more frequently in the data or which is repeated more time in the data.

Q. Define G.M.

Ans. It is defined as the arithmetic mean of the values taken on a log scale. It is also expressed as the n^{th} root of the product of an observation.

Q. Define H.M.

Ans. A set of n values x_1, x_2, \dots, x_n is the reciprocal of the A.M. of the reciprocals of the values.

Q. Define weighted A.M.?

Ans. The numerical values of the relative values with respective weight is called weighted arithmetic Mean.

Q. Define/Explain properties of A.M.?

Ans. Properties of A.M.

(i) Sum of deviations of the values from their mean

$$\bar{x}_n = \frac{\sum \omega x}{\sum \omega}$$

Combine Mean

$$\bar{x} = \frac{n_1 \bar{x}_1 + n_2 \bar{x}_2 + \dots + n_k \bar{x}_k}{n_1 + n_2 + \dots + n_k}$$

In Empirical Relation between Mean, Median and Mode.

- (i) Mean = Median = Mode
- (ii) Mode = 3 Median - 2 Mean

MEASURES OF DISPERSION

SELECT APPROPRIATE ANSWER

1. In a symmetrical distribution mean, median and mode, _____
 - (a) Positive
 - (b) Greater
 - (c) Less than
 - (d) Coincide
2. The second moment about mean is _____
 - (a) Variance
 - (b) Mean
 - (c) S.D.
 - (d) Mode
3. The A.M. is greater than mode is equal to _____
 - (a) +vely
 - (b) Skewness
 - (c) Negatively
 - (d) zero
4. The frequency distribution mean > Median > Mode is called _____
 - (a) Negatively
 - (b) Symmetrical
 - (c) +vely
 - (d) One
5. Range of 5, 5, 5, 5, is _____
 - (a) 0
 - (b) 5
 - (c) 25
 - (d) None of these

6. Which is poor measure of dispersion in distribution _____
- Quartile deviation
 - Semi-inter quartile range
 - Range
 - None of these
7. The degree to which numerical data tend to spread about an average value is a _____
- Range
 - Variance
 - Minimum
 - Dispersion
8. If $y = bx + c$ the mean deviation of y is _____
- Range of P
 - Quartile of x
 - Range of X
 - Zero
9. If $y = bx + a$ the mean deviation of y is _____
- S.D. of y
 - Var (x)
 - S.D. of x
 - M.D. of x
10. If $y = ax + b$ the S.D. of y is _____
- Mean Deviation of x
 - Minimum
 - S.D. of x
 - Maximum
11. Absolute sum of deviations is minimum from _____
- Coefficient of variance
 - S.D. of x
 - Mean
 - Normal
12. The lack of uniformity is called _____
- Lack
 - Variation
 - $X = 5$
 - Skewness
13. Relative measure of skewness was introduced by _____
- Rowley
 - Lack
 - Karl Person
 - Mode
14. Second moment about mean is always equal to _____
- S.D.
 - C.V.
 - Variance
 - Square
15. In grouped data, the range is the difference between _____
- Two extreme class boundaries
 - Two extreme class frequencies
 - Two extreme class limits
 - None of these
16. The measure of relative dispersion is called _____
- Quartile deviation
 - Mean derivative
 - Mean coefficient
 - Coefficient of quartile Deviation
17. Mean deviation is equal to $\frac{4}{5}$ of the manipulation.
- Quartile deviation
 - Range
 - Standard deviation
 - Variance
18. Quartile deviation is not capable of manipulation _____
- Easy
 - Mathematically
 - Abjectly
 - Algebraic

19. The correct variance is define as the _____
 (a) Varies of data $\cdot \frac{p^2}{6}$ (b) S.D. of data $\cdot \frac{h^2}{12}$
 (c) M.D. of data $\cdot \frac{h^2}{6}$ (d) Variance of data $\cdot \frac{h^2}{12}$
20. The variance of 4, 4, 4, 4, 4 is _____
 (a) -4 (b) $(4)^2$
 (c) 8 (d) None of these
21. Mean deviation is always _____
 (a) Equal to S.D. (b) More than S.D.
 (c) Less than S.D. (d) Negative
22. In symmetrical distribution, the co-efficient of skewness is equal to _____.
 (a) -1 (b) +1
 (c) 0 (d) None of these
23. The S.D. and variance are _____ of origin.
 (a) Multiplied (b) Variance
 (c) Change (d) Independent
24. _____ of the distribution known as Normal.
 (a) Skewed (b) Flatness
 (c) Normal (d) Moment
25. The _____ in the distribution around which the observations tend to lie.
 (a) Mean (b) Dispersion
 (c) Manner (d) Central value
26. Check the consistency used _____.
 (a) Coefficient of dispersion (b) Mean coefficient
 (c) Coefficient of variation (d) Q.D.
27. The standard deviation is affected by the value of every _____.
 (a) Relative Dispersion (b) Observation
 (c) Absolute (d) Items
28. The value of interval $x \pm S$ include _____.
 (a) 49.45% (b) 95.45%
 (c) 68.27% (d) 99.73%
29. First moment about mean is always equal to _____.
 (a) S.D. (b) 1
 (c) Zero (d) None of these
30. First moment about origin is always equal to _____.
 (a) A.M. (b) Variance
 (c) Zero (d) None of these
31. _____ is the simplest means of dispersion:
 (a) Standard deviation (b) Variation
 (c) C.V. (d) Range
32. The sum of odd powers of deviation from mean is zero is called _____.
 (a) Mean (b) Lack
 (c) Normal (d) Skewed

33. If variance is standard deviation is minimum if the deviations taken from _____
- Mode
 - Mean
 - Average
 - G.M.
34. If skewed distribution the three averages mean median and mode are _____
- Identical
 - Different
 - Zero
 - None of these
35. If third moment about mean is equal to zero, then distribution is _____
- Negatively skewed
 - Symmetrical
 - Positively skewed
 - None of These
36. The sum of absolute deviations from median is _____
- Zero
 - Positive
 - Least
 - None of these
37. The sum of the squares of deviations is the least when measured from _____
- A.M.
 - Median
 - Mode
 - G.M.
38. Mean deviation = _____ S.D.
- $\frac{2}{3}$
 - $\frac{4}{5}$
 - $\frac{5}{6}$
 - $\frac{6}{5}$
39. The shape of the symmetrical distribution is _____
- U-shaped
 - J-shaped
 - Bell-shaped
 - None of these
40. Standard deviation is always calculated from _____
- Mean
 - Median
 - Mode
 - G.M.
41. If all values are same then the measure of dispersion will be _____
- 1
 - 0
 - Mean
 - Mode
 - Median
42. Suppose for 40 observations, the variance is 50. If all the observations are increased by 20, the variance of these increased observation will be:
- 50
 - 70
 - $50/20$
 - $50+20=30$
43. Variance remains unchanged by change of
- Origin
 - Scale
 - Both
 - None of these
44. If $Y=-8X - 5$ and SD of X is 3, then SD of Y is
- 8
 - 3
 - None of these

ANSWERS

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

QUESTIONS & ANSWERS

47. The percentage of values lies between $X \pm 2SD$ is
- (a) 68.26 %
 - (b) 95.45 %
 - (c) 99.7 %
 - (d) 65 %

48. Lowest value of variance can be
- (a) 1
 - (b) -1
 - (c) 3
 - (d) 0

Q. What is range?

49. Mean Deviation, Variance and Standard Deviation of the values 4, 4, 4, 4, 4 is

- (a) 4
- (b) 8
- (c) 2
- (d) 0

12 15 11 18 13 14 18
The range is $(18 - 11) = 7$.

50. The mean deviation of the values, 18, 12, 15 is
- (a) 6
 - (b) Zero
 - (c) 3
 - (d) 2

Q. Define semi interquartile range.
Ans. Half of the difference between upper and lower quartiles.

(Group data) Correct variance = variance of grouped data $\frac{h^2}{12}$

Mean Deviation = $4/5$ (Standard deviation)

Q.D. = $2/3$ (S.D.)

Q.D. = $5/6$ (MD)

C.V. = $\frac{S}{X} \times 100$

Relative Dispersion = $\frac{\text{Absolute Dispersion}}{\text{Average}}$

Coefficient of Q.D. = $\frac{Q_3 - Q_1}{Q_3 + Q_1}$

Coefficient of dispersion = $\frac{X_m - X_o}{X_m + X_o}$

Mean Coefficient of dispersion = $\frac{M.D.}{\bar{x}}$

Co-efficient of Skewness = $\frac{\text{Mean} - \text{Mode}}{\text{S.D.}}$

Co-efficient of Skewness = $\frac{3(\text{Mean} - \text{Median})}{\text{S.D.}}$

Quartile coefficient of skewness = $\frac{Q_3 + Q_1 - 2 \text{Median}}{Q_3 - Q_1}$

4. Consumer price Index Number also called _____ is designed to measure changes.

- (a) Cost Living Index Number
 - (b) Whole Sale Index number
 - (c) Weighted Index Number
 - (d) Consumer Index Number
- *****

Chapter 5

INDEX NUMBER

SELECT APPROPRIATE ANSWER

1. The Index numbers are used to measure seasonal and cyclical variations in _____

- (a) Commodities
- (b) Time Series
- (c) Whole sale
- (d) Relatives

2. All Index numbers are not suitable for all _____

- (a) Kind
- (b) Chain relative
- (c) Purpose
- (d) Prices

3. An Index Number calculated for more than one items is called _____

- (a) Sensitive Price Index number
- (b) Consumer Index Number.
- (c) Simple Aggregative I. Number
- (d) Chain Indices

4. Consumer price Index Number also called _____ is designed to measure changes.

- (a) Cost Living Index Number
- (b) Whole Sale Index number
- (c) Weighted Index Number
- (d) Consumer Index Number

5. Ratio between given year and base year is called —
 percentage.
 (a) Price relative
 (b) Link relative
 (c) Retail price
 (d) None of these
6. An Index number of an average quality of wheat in Lakh
 — Index.
 (a) Volume Index Number
 (b) Value Index Number
 (c) Quantity Index Number
 (d) Weight Index Number
7. G.M. between — is called to be Fisher's Index Number
 (a) Paasche's Index Number
 (b) Marshal and Laspeyres
 (c) Laspeyre's and Paasche's
 (d) Fisher and Paasche's
8. Weighted Index number can be classified into — categories.
 (a) Four
 (b) Three
 (c) Five
 (d) Two
9. Average calculated used in index number by — method
 (a) Three
 (b) Two
 (c) Four
 (d) One
10. Price in proceeding year used in the method is called —
 (a) Fixed Method
 (b) Chain method
 (c) Aggregative Method
 (d) Volume
11. The object of index number also determines its —
 (a) Index Number
 (b) Special-purpose
 (c) Reliable
 (d) Scope
12. Measure the change in quantity of goods are called —
 (a) Simple I. No.
 (b) Aggregative I. No.
 (c) Appropriate
 (d) Quantity Index Number
13. An Index number which measures the change of a — is called Aggregative I. No.
 (a) Industrial activity
 (b) Retail price
 (c) Cost of living
 (d) Goods consumed
14. 1. Nos. is a — for measuring changes in a variable or a group of related variables.
 (a) Variable
 (b) Region of goods
 (c) Device
 (d) Cost
15. Single number which shows — changes in a phenomenon is called an Index Number
 (a) Overall
 (b) Same
 (c) Variation
 (d) Capable
16. Index Number is an important role in the field of Economic and —
 (a) Science
 (b) Education
 (c) Intelligence
 (d) Business
17. Link relative = —
 (a) $\frac{P_n}{P_o} \times 100$
 (b) $\frac{P_o}{P_n} \times 100$
 (c) $\frac{P_n}{P_{n-1}} \times 100$
 (d) $\frac{P_n}{P_1} \times 100$

18. Qon means _____ for the given year.
 (a) Price
 (b) Commodity
 (c) Quantity in current
 (d) Quantity Index
19. The weighty system changed with _____
 (a) Yearly
 (b) Basely
 (c) Timely
 (d) Averagely
20. Volume Index in Marshall is _____
 (a) $\frac{\sum p_n(p_o + p_n)}{\sum p_n(p_o + p_n)} \times 100$
 (b) $\frac{\sum p_n(q_o + q_n)}{\sum p_n} \times 100$
 (c) $\frac{\sum q_n(p_o + p_n)}{\sum q_o(p_o + p_n)} \times 100$
21. In computation of index number averages to be used are
 A.M., G.M. and _____
 (a) H.M.
 (b) Median
 (c) Mode
22. In chain base method, the base period is _____
 (a) Fixed
 (b) Constant
 (c) Changed
 (d) None of these
23. The Index Numbers are used to measure seasonal and cyclical variations in _____
 (a) Wholesale
 (b) Relatives
 (c) Commodities
 (d) Time series
24. Link relative = _____
 (a) $\frac{P_n}{P_{n-1}} \times 100$
 (b) $\frac{P_n}{P_o} \times 100$
25. Volume index in Marshall is _____
 (a) $\frac{\sum p_n(p_o + p_n)}{\sum p_n(p_o + p_n)} \times 100$
 (b) $\frac{\sum q_n(p_o + p_n)}{\sum q_o(p_o + p_n)} \times 100$
 (c) $\frac{\sum p_n(q_o + q_n)}{\sum p_n} \times 100$
 (d) $\frac{\sum q_n(p_o + p_n)}{\sum q_o(p_o + p_n)} \times 100$
26. Paasche's Index number is _____
 (a) $\frac{\sum p_n q_o}{\sum p_o q_o}$
 (b) $\frac{\sum p_n q_n}{\sum p_n q_o} \times 100$
 (c) $\frac{\sum p_n q_n}{\sum p_o q_n}$
 (d) $\frac{\sum p_n q_n}{\sum p_o q_n} \times 100$
27. Base year quantities are used as weights in: _____
 (a) Laspeyre's index
 (b) Paasche's index
 (c) Fisher's index
 (d) None of these
28. Which of the formula is used in chain indices: _____
 (a) $\frac{\sum p_n}{\sum p_o} \times 100$
 (b) $\frac{P_n}{P_o} \times 100$
 (c) $\frac{P_n}{P_{n-1}} \times 100$
 (d) Both (a) and (b) but not (c)
29. Fisher's ideal index number is also obtained by: _____
 (a) Taking A.M. of Laspeyre's and Paasche's index
 (b) Taking G.M. of Laspeyre's and Paasche's index
 (c) Both (a) and (b)
 (d) None of these

31. An index number is used:
- To measure changes in quantity
 - To measure changes in price
 - To measure changes in a variable over time
 - To measure changes in demand

32. The ratio of a new price to the base year price is called the:
- Price decrease
 - Price absolute
 - Price relative
 - Price increase

33. A simple aggregate quantity index is used to:
- Measure the change in quantity of a product
 - Measure the overall change in price of a range of products
 - Measure the overall change in quantity of a range of products.
 - Measure the change in price of a product

34. A simple aggregate price index:
- Ignores relative quantities
 - Compares relative quantities to relative prices
 - Compares absolute prices to absolute quantities
 - Considers relative quantities

35. This index measures the change from month to month in the cost of a representative 'basket' of goods and services of the type bought by a typical household:
- Laspeyres Price Index
 - Paasche Price Index
 - Retail Price Index

36. The Laspeyres and Paasche index are examples of:

37. The Laspeyres price index:
- Regards the base year quantities as fixed
 - Regards the base year prices as fixed
 - Regards the current year quantities as fixed
 - The Laspeyres quantity index.

38. The formula $\frac{\sum P_0 Q_n}{\sum P_0 Q_0} \times 100$ is used to calculate:
- The Laspeyres price index
 - The Paasche quantity index
 - The Laspeyres quantity index.
 - The Paasche price index

39. The formula $\frac{\sum P_n Q_n}{\sum P_0 Q_n} \times 100$ is used to calculate:
- The Laspeyres price index
 - The Paasche price index
 - The Paasche quantity index
 - The Laspeyres quantity index

40. A scaling factor is used to:
- Change a simple index to a weighted index
 - Convert the Paasche index to a Laspeyres index
 - Change the base year
 - Change an aggregate index to a weighted index

ANSWERS

1.(b)	2. (c)	3. (c)	4. (a)	5. (a)	6. (c)	7. (c)	8. (c)
9. (a)	10.(b)	11.(d)	12.(d)	13.(c)	14.(c)	15.(a)	16.(c)
17.(c)	18.(d)	19.(c)	20.(c)	21.(b)	22.(c)	23.(d)	24.(a)
25.(d)	26.(a)	27.(a)	28.(c)	29.(b)	30.(a)	31.(c)	32.(c)
33. (b)	34. (a)	35. (c)	36. (b)	37. (a)	38. (c)	39. (c)	40. (c)

Question & Answers

Q. Define Index number.

Ans. Index numbers are statistical measures designed to show changes in a variable or group of related variables with respect to time, geographic location or other characteristics such as income, profession, etc. A collection of index numbers for different years, locations, etc., is sometimes called an index series..

Q. Explain two kinds of Base Period.

Ans. Fixed Base Method: The average price of a particular year is used as base. If a that year are base, the base year should not be far distant in the past.

$$\text{Pon } \frac{P_n}{P_{n-1}} \times 100$$

Simple Aggregative Index Numbers: The total of the prices of commodities in a given year is expressed as percentage of the total of the prices of commodities in the base year.

Aggregative Expenditure: In which method quantities consumed in the base year are taken as weights.

Family Budget Method: The expenditure incurred by family on various items in base period as weight used is called Family Budget.

Consumer Price Index Number: It designed to measure the change in the cost of living is called consumer price Index Number.

Q. Explain types of Index number.

Ans. (i) Price Index Number: Price index numbers measure the relative changes in prices of a commodities between two periods. Prices can be either retail or wholesale.

(ii) Quantity Index number: These index numbers are considered to measure changes in the physical quantity of goods produced, consumed or sold of an item or a group of items.

(iii) Aggregative Index Number: It is a phenomenon to change the measurement like cost of living, total Industrial production etc.

Q. Define Simple Index Number:
Ans: A simple index number is a number that measures a relative change in a single variable with respect to a base.

Q. Define Composite Index Number:
Ans. A composite index number is a number that measures an average relative changes in a group of relative variables with respect to a base.

Chapter 6

PROBABILITY

SELECT APPROPRIATE ANSWER

1. An event that contains the finite number point the sample space is called _____
(a) Finite (b) Random
(c) Continuous (d) Values

2. A subset of the sample space is called _____
(a) Sample points (b) Set
(c) Event (d) Space

3. The probability of a save event is equal to _____
(a) Two (b) Three
(c) Four (d) One

4. Two event are said to be equally likely is _____
(a) As any other (b) both event occurs
(c) One occurs (d) Not both occurs

5. A set of events is said to be independent if probability of head on tossing a coin is _____
(a) $1/2$ (b) $2/3$
(c) 1 (d) $3/4$

- Emporium: MCQ Statistics
- When a three die rolled the sample space consists of
6. When a three die rolled the sample space consists of
 - (a) 6 outcomes
 - (b) 24 outcomes
 - (c) 216 outcomes
 - (d) 120 outcomes
 7. If the occurrence of excludes the occurrence of other is called _____
 - (a) Mutually exclusive
 - (b) Exhaustive
 - (c) Likely
 - (d) Probability
 8. The picture cards having in total fifty two cards is equal to
 - (a) 16
 - (b) 24
 - (c) 12
 9. The probability of even/odd numbers when a fair die is rolled is
 - (a) $\frac{1}{16}$
 - (b) $\frac{2}{6}$
 - (c) $\frac{1}{36}$
 - (d) $\frac{3}{6}$
 10. Addition Law of probability for mutually exclusive event is equal to
 - (a) $P(A \cup B) = P(A) + P(B)$
 - (b) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
 - (c) $P(A \cap B) = P(A) + P(B) + P(A \cap B)$
 - (d) $P(A \cap B) = P(A) \cdot P(B)$
 11. _____ are said to be exhaustive if they constitute the entire sample space.
 - (a) Equally likely
 - (b) Events
 - (c) Outcomes
 - (d) Objects
- If two events can both occur at the same time then they are referred as: _____
12. If two events can both occur at the same time then they are referred as:
 - (a) Dependent events
 - (b) Mutually Exclusive events
 - (c) Exhaustive events
 - (d) Independent events
 13. If two events have same chance of occurrence they are called: _____
 - (a) Equally likely events
 - (b) Exhaustive events
 - (c) Mutually Exclusive events
 - (d) Dependent events
 14. Events occurring together without affecting each other are called: _____
 - (a) Dependent events
 - (b) Independent events
 - (c) Equally likely events
 - (d) Mutually Exclusive events
 15. A list of sample _____ is called sample space.
 - (a) Event
 - (b) Subset
 - (c) Point
 - (d) Distinct
 16. The possibility of total outcome in a coin is equal to
 - (a) Fifty %
 - (b) Twenty %
 - (c) 60 %
 - (d) 30 %

17. A experiment repeated number of times one by one is called _____
- Random
 - Introduce
18. If an event consists of only one sample point, it is called _____
- Appeared
 - Exactly
 - Space
 - Elementary event
19. All experiments have _____ properties in common
- Four
 - Three
 - Two
 - One
20. The probability of an event cannot be _____
- Positive
 - Zero
 - None of these
 - Negative
21. If A and A' are complementary events then that law is called _____
- Multiplication law
 - Complementary law
 - Distributive law
 - Addition law
22. The probability of drawing a diamond card out of cards is _____
- $\frac{13}{52}$
 - $\frac{1}{2}$
 - 0
 - $\frac{4}{52}$
23. The probability of drawing a picture card out of 52 cards is: _____
- $\frac{13}{52}$
 - $\frac{12}{52}$
 - $\frac{16}{52}$
 - $\frac{3}{52}$
24. The probability of drawing an even number in a toss of a balanced die. _____
- $\frac{1}{6}$
 - $\frac{2}{6}$
 - $\frac{3}{6}$
 - $\frac{6}{6}$
25. The probability of drawing same number on two dice if two dice are thrown _____
- $\frac{1}{36}$
 - $\frac{6}{36}$
 - $\frac{12}{36}$
 - $\frac{18}{36}$
26. A box containing 12 balls of color 6 red and 6 white. A ball of white selected ball finds the probability of white _____
- $\frac{7}{12}$
 - $\frac{6}{12}$
 - $\frac{12}{12}$
 - $\frac{4}{12}$
27. A fair coin toss the total event in sample space is equal _____
- 7
 - 16
 - 36
 - 6

28. The square bracket is an finite G. Series is obtained
 formula $\frac{1}{1-r^n}$
- $\frac{1}{1-r^n}$
 - $\frac{a}{1-r}$
 - $\frac{a}{(1-r)^n}$
 - $\frac{a}{1+r^n}$
29. The probability that the sum is odd if two dice are thrown: $\frac{18}{36}$
- $\frac{9}{36}$
 - $\frac{12}{36}$
 - $\frac{6}{36}$
30. The probability of getting exactly three tails when three balanced coins are tossed once: $\frac{1}{8}$
- $\frac{1}{8}$
 - $\frac{2}{8}$
 - $\frac{5}{8}$
 - $\frac{7}{8}$
31. The probability of getting exactly two heads when balanced coins are tossed once: $\frac{1}{4}$
- $\frac{1}{4}$
 - $\frac{2}{4}$
 - $\frac{3}{4}$
 - $\frac{4}{4}$
32. The probability of getting at least one head when balanced coins are tossed once: $\frac{1}{4}$
- $\frac{1}{4}$
 - $\frac{2}{4}$
 - $\frac{3}{4}$
 - $\frac{4}{4}$
33. If $P(\bar{B}) = \frac{1}{2}$, $P(A \cap B) = \frac{1}{6}$, A and B are independent then $P\left(\frac{A}{B}\right)$ is _____
- $\frac{1}{2}$
 - $\frac{1}{3}$
 - $\frac{1}{12}$
 - $\frac{5}{6}$
34. A coin is so weighted that $P(T) = 2P(H)$ then $P(H)$ is _____
- $\frac{1}{2}$
 - 1
 - $\frac{2}{3}$
 - $\frac{1}{3}$
35. If $P\left(\frac{A}{B}\right) = \frac{1}{4}$ and $P(A \cap B) = \frac{1}{5}$ then $P(B)$ is _____
- $\frac{4}{5}$
 - $\frac{1}{20}$
 - 0
 - $\frac{1}{9}$
36. Three light bulbs are selected; bulb might be defective or non - defective. In this experiment the sample space will contains how many points _____
- 4
 - 8
 - 9
 - 2

37. If $P\left(\frac{B}{A}\right) = 0.25$ and $P(A \cap B) = 0.2$ then $P(A)$ will be _____

equal to _____

(a) 0.05

(c) 0.8

(b) 0.75

(d) 0.45

38. If in a coin $P(H) = 2P(T)$ then prob. of head is _____

(a) $\frac{1}{3}$

(b) $\frac{2}{3}$

(c) $\frac{1}{2}$

(d) 0

39. If $P(A \cap B) = \frac{7}{8}$ then $P(\bar{A} \cup \bar{B})$ is _____

(a) $\frac{1}{8}$

(b) 0

(c) 1

(d) $\frac{3}{8}$

40. If $P(A \cap B) = \frac{1}{4}$ then $P(\bar{A} \cup B)$ is _____

(a) $\frac{1}{2}$

(b) $\frac{1}{3}$

(c) $\frac{1}{12}$

(d) $\frac{3}{8}$

41. Which of the following can never be taken as the probability of an event:

(a) 1

(b) 0

(c) -0.5

(d) Both (a) and (b) but not (c)

42. $A \cap B$ means: _____

(a) The elements of A or B

(b) The elements of A and B

(c) The elements A but not of B

(d) None of these

43. The product of first 'n' natural numbers is: _____

(a) 1.2.3.4.....

(b) $1.2.3.....(n-2)(n-1)n$

(c) $n(n-1)(n-2).....3.2.1.0$

(d) None of these

44. 5C_5 is equal to: _____

(a) 5

(b) 5×5

(c) 1

(d) None of these

45. If 'A' denotes the males of a town and 'B' denotes the females of that town, then A and B are: _____

(a) Equal sets

(b) Overlapping sets

(c) Non-overlapping sets

(d) None of these

46. If the occurrence of one event means that another cannot happen, then the events are: _____

(a) Independent

(b) Mutually Exclusive

(c) Bayesian

(d) Empirical

47. If a card is chosen from a standard deck of cards, what is the probability of getting a diamond (\spadesuit) or a club(\clubsuit)?

52. In special rule of addition of probability, the events are always: _____
- Independent events
 - Mutually Exclusive events
53. If you roll a pair of dice, what is the probability that (at least) one of the dice is a 4 or the sum of the dice is 7?
- 4/36
 - 13/36
 - 21/36
 - 15/36
54. If a card is chosen from a standard deck of cards, what is the probability of getting a five or a seven?
- 4/52
 - 1/26
 - 8/52
 - 1/169
55. The the special rule of multiplication of probability, the events must be: _____
- Independent
 - Mutually exclusive
 - Bayesian
 - Empirical
56. Which of the following is *not* a correct statement about a Probability: _____
- It must have a value between 0 and 1
 - It can be reported as a decimal or a fraction
 - A value near 0 means that the event is not likely to occur/happens
 - It is the collection of several experiments.
57. The joint probability is: _____
- The likelihood of two events happening together
 - The likelihood of an event happening given that another event has already ha
 - Based on two mutually exclusive events
 - Also called Prior probability
48. Which of the following is not an example of a discrete probability distribution?
- The sale or purchase price of a house
 - The number of bedrooms in a house
 - Whether or not a home has a swimming pool in it.
49. A listing of the possible outcomes of an experiment and the corresponding probability is called: _____
- Random Variable
 - Contingency table
 - Bayesian table
 - Frequency distribution
50. The collection of one or more outcomes from an experiment Called: _____
- Probability
 - Event
 - Random Variable
 - Random Experiment
51. In which approach to probability the outcomes are equally likely to occur?
- Classical Probability
 - Subjective Probability
 - Relative Frequency
 - Independent

58. In a Poisson probability distribution:

- (a) The mean and variance of the distribution are same (equal)
- (b) The probability of success is always greater than 5
- (c) The number of trials is always less than 5
- (d) It always contains a contingency table

ANSWERS

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

Chapter 7

RANDOM VARIABLE AND PROBABILITY DISTRIBUTIONS

SELECT APPROPRIATE ANSWER

1. Discrete random variable is real valued function defined on a _____ sample space.
 - (a) Discrete
 - (b) Variable
 - (c) Scale

2. $E(ax + b) = A E(x) + \underline{\hspace{2cm}}$
 - (a) (C)
 - (b) $E(x)$
 - (c) $b E(x)$
 - (d) b

3. If $E(ax) = \underline{\hspace{2cm}}$
 - (a) a
 - (b) $a E(x)$
 - (c) $x E(a)$

4. If $E(x)$ is the expected value of X then $E[x - E(x)] = \underline{\hspace{2cm}}$
 - (a) $E(x) - E(x)$
 - (b) $E(x) - 0$
 - (c) 0
 - (d) $E(x) + E(x)$

5. The variance of random variable of x then $\text{var}(x) = E[x^2] - E[x]^2$
- $(X - A)^2$
 - $E(x)$
 - $(x - u)^2$
 - $(x - 4)^2$
6. A random variable may be _____
- fixed
 - continuous
 - discrete
 - discrete or continuous
7. The basic random numbers are _____
- 0 and 1
 - 0, 1, 2, 9
 - 1, 2, 3 ... 10
 - None of these
8. Two digit random numbers are _____
- 2
 - 10
 - 99
 - 100
9. The time taken by an athlete to run a 400 mile race SAF games _____
- Continuous data
 - Random
 - Discrete date
10. The mathematical exception of $x + y$ is equal to _____
- $E(x + 0)$
 - $E(x + x)$
 - $E(x) + E(y)$
 - $E(v)$
11. _____ are the numbers obtained by some random process.
- Two digit number take
 - Random table
 - Pack
12. Experiment in which outcomes vary from trial to trial _____
- Experiment
 - Variable
 - Random experiment
13. Random numbers are used for selection of _____
- Random space
 - Space
 - Random sample
14. A function probabilities that a random variable of x has a value less than is called _____
- Random function
 - Distribution function
 - Continuous function
 - probability function
15. A random variable is that whose value is determined by the outcome of _____
- Trial
 - event
 - Experiment
 - Random experiments
16. A continuous random variable which can assume all possible values on scale in a given _____
- Interval
 - Point
 - Time
 - Sample space
17. A random variable is _____
- Not a function
 - A continuous variable
 - A function
 - None of these
18. Random numbers are also called _____
- Random experiment
 - Random Errors
 - Random digits
 - None of these

19. Hourly temperature recorded by weather bureau
the example of _____
 (a) Discrete variable (b) Qualitative variable
 (c) Continuous variable (d) None of these
20. The number of defective bulbs in a lot is example
of _____
 (a) Continuous variable (b) Discrete variable
 (c) Function (d) None of above
21. $\text{Var}(kY) = \frac{k^2 \text{Var}(Y)}{k^2}$
 (a) $k \text{Var}(Y)$ (b) $k^2 \text{Var}(Y)$
 (c) $\text{Var}(Y)$ (d) $\frac{\text{Mean}}{\text{S.D.}} \times 100$
22. If a & b are constants, then $\text{Var}(a + bX)$ equals to: _____
 (a) $\text{Var}(bX) + a$ (b) $b^2 \text{Var}(X)$
 (c) $b\text{Var}(X)$ (d) None of these
23. For two independent random variables X & Y
 $\text{Var}(x \pm y) = \dots\dots\dots$
 (a) $\text{Var}(X) + \text{Var}(Y)$ (b) $\text{Var}(X) - \text{Var}(Y)$
 (c) $\text{Var}(X) \pm$ (d) Zero
24. For discrete random X, the expectation of X i.e., $E(X)$ is equal to: _____
 (a) $\sum P(x)$ (b) $\sum x.P(x)$
 (c) $\sum x^2 P(x)$ (d) One
25. Coefficient of variation (C.V.) is given below: _____
 (a) $\frac{\text{Mean}}{\text{S.D.}}$ (b) $\frac{\text{S.D.}}{\text{Mean}} \times 100$
 (c) $\frac{\text{Mean}}{\text{S.D.}} \times 100$ (d) $\frac{\text{S.D.}}{\text{Mean}}$
26. A discrete probability distribution may be represented by
 (a) A table (b) A graph
 (c) A mathematical Equation (d) All of these
27. If C is non-random variable, the $E(C)$ is
 (a) Zero (b) C
 (c) 1 (d) 2
28. For a random variable X, $E(X)$ is
 (a) Harmonic Mean (HM) (b) Geometric Mean (GM)
 (c) Arithmetic Mean (AM) (d) Non
29. The probability function is always
 (a) Negative (b) Non Negative
 (c) Positive (d) None
30. Probability of occurrence of an event lies between
 (a) -1 and 0 (b) 0 and 1
 (c) -1 and 1 (d) exactly 1
31. Probability distribution of a random variable is also known as Probability
 (a) Probability Function (b) Distribution Function
 (b) Probability Distribution (d) Probability Density Function

32. Total Area under the curve in probability of density function

- Is?
- (a) 0
 - (b) -1
 - (c) 1
 - (d) Infinity

33. For a probability density function (pdf), the probability of a

single point is

- (a) 1
- (b) 2
- (c) 0
- (d) Constant

34. The distribution function $F(X)$ is represented by

- (a) $P(X=x)$
- (b) $P(X < x)$
- (c) $P(X > x)$
- (d) $P(X \leq x)$

35. What is the probability that a ball drawn at random from a jar?

- (a) 0.1
- (b) 1
- (c) 0.5
- (d) 0
- (e) Cannot be determined from given information

36. For distribution Function $F(X)$, $F(-\infty)=0$ and $F(\infty)=?$

- (a) 0
- (b) -1
- (c) 1

ANSWERS

1. (a)	2. (b)	3. (b)	4. (c)	5. (d)	6. (d)	7. (b)	8. (d)
9. (a)	10.(b)	11.(b)	12.(b)	13.(a)	14.(b)	15.(d)	16.(d)
17.(c)	18.(c)	19.(c)	20.(b)	21.(b)	22.(b)	23.(a)	24.(a)
25. (b)	26. (d)	27. (b)	28. (b)	29. (b)	30. (b)	31. (b)	32. (b)
33. (c)	34. (d)	35 (e)	36. (c)				



Q.
Ans.

Q.
Ans.

Ans. (i) $\sum a_i$ $a_i \neq 0$
(ii) $\frac{1}{n}$
(iii) $\frac{1}{2}$

$$\begin{aligned} \text{Var}(X + Y) &= \text{Var}(X) + \text{Var}(Y) \\ \text{Where } X \text{ and } Y \text{ are independent variables} \end{aligned}$$

$$\begin{aligned} E(X) &= E[X - \mu] = 0 \\ \text{S.D. (X)} &= \sqrt{\text{Var}(X)} \end{aligned}$$

Co-efficient of variation:

$$\text{C.V.} = \frac{\text{S.D.}}{\text{Mean}} \times 100$$

For Discrete Probability Distribution (Probability Function):

$$\begin{aligned} (\text{i}) \quad \sum P(x) &= 1 \\ (\text{ii}) \quad 0 \leq P(x) &\leq 1 \end{aligned}$$

For Continuous Probability Distribution (Probability Density Function):

- $f(x) \geq 0$, for all values of X
- The area under the curve and above x -axis is equal to one

$$\text{Area of trapezoid} = \frac{\text{Sum of Parallel sides} \times \text{base}}{2}$$

$$P(a < X < b) = \left[\frac{f(a) + f(b)}{2} \right] \times (b - a)$$

BINOMIAL AND HYPERGEOMETRIC PROBABILITY DISTRIBUTION

GIVE APPROPRIATE ANSWER

- In binomial distribution the probability of success remains _____ from trial to trial.
 - Constant
 - Varies
 - Four
 - Probability
- Binomial distribution has _____ parameter.
 - 4
 - 3
 - 2
 - 6
- A binomial random variable can assume values from _____ to n .
 - 6
 - 3
 - 2
 - 0
- Binomial distribution is symmetrical when $P =$ _____
 - n
 - x
 - q
 - $1 - P$

5. In the binomial experiment, the outcome of each trial may be classified into _____
 (a) Success
 (b) Failure
 (c) Success or failure
 (d) None of these
6. In binomial experiment, the probability of success denoted by _____
 (a) p
 (b) q
 (c) p
 (d) $1 - p$
7. In binomial experiment, the successive trials are _____
 (a) Dependent
 (b) independent
 (c) Related
 (d) constant
8. The mean of a binomial distribution is always _____
 (a) Equal to variance
 (b) Less than variance
 (c) Greater than variance
 (d) None of these
9. In binomial experiment successive trials are _____
 (a) Dependent
 (b) Independent
 (c) May be independent or dependent
 (d) None of these
10. When X denotes the number of success in binomial experiment, it is called: _____
 (a) Random variable
11. Mean of the binomial distribution is _____
 (a) Pq
 (b) nP
 (c) xm
12. In a binomial distribution the probability of changes from trial to trial.
 (a) Failure
 (b) Experiment
 (c) Success
 (d) Out come
13. The mean and variance of binomial distribution are _____
 (a) Unequal
 (b) Equal
 (c) Symmetrical
 (d) None
14. The hypergeometric probability distribution is used rather than the binomial or Poisson when the sampling is performed:
 (a). with replacement.
 (b). without replacement from an infinite population.
 (c). without replacement from a finite population.
 (d). with replacement from a finite population.
15. In binomial distribution with _____ trials mean is np and variance is npq .
 (a) Dependent
 (b) Independent
 (c) Linear
 (d) Equal

16. Binomial distribution is symmetrical when $P = \frac{1}{q}$

- (a) $\frac{1}{q}$
- (b) 1
- (c) q
- (d) q

17. In binomial experiment, the experiment is repeated _____ times.

- (a) n; fixed number of times
- (b) a large number times.
- (c) n; where $n < 0$
- (d) $n = 100$

18. Binomial probability distribution is denoted by $b(x; n, p)$, is defined as _____

- (a) $\binom{n}{r} p^r q^{n-r}$
- (b) $\binom{n}{x} p^x (1-p)^{x-n}$
- (c) $n C_x p^n q^{n-x}$
- (d) $\binom{n}{r} p(r-1-P)^r$

19. Binomial distribution is used when n is _____

- (a) Large
- (b) Small
- (c) Zero
- (d) Normal

20. Binomial distribution is positively skewed when _____

- (a) $p > q$
- (b) $P = q$
- (c) $p < q$
- (d) P/q

21. Binomial distribution is used when _____ is large.

- (a) nP
- (b) nq
- (c) p
- (d) n

22. If $(q + p)$ has variance is _____

- (a) $6 pq$
- (b) $n pq$
- (c) $7 pq$
- (d) $3 pq$

23. If $u = 5$ and S.D. = 2.5 then Binomial distribution are _____

- (a) Unequal
- (b) Wrong
- (c) Fair
- (d) None of these

24. If mean and variance are not equal then distribution _____

- (a) None
- (b) Symmetrical
- (c) Skewed
- (d) Equal

25. In a binomial distribution mean and variance is _____

- (a) Variance > mean
- (b) Mean < variance
- (c) Variance \neq mean
- (d) None of these

26. Binomial distribution ranges from _____

- (a) 1 to n
- (b) 0 to n
- (c) 1 to ∞
- (d) 0 to ∞

27. If $p = 0.1$ and $n = 400$ then mean _____

- (a) 60
- (b) 30
- (c) 20
- (d) 40

28. Which of the following is not a requirement for binomial distribution?

- (a) Constant Probability of Success
- (b) Only two possible outcomes

- (c) A fixed number of trials
 (d) Equally likely outcomes

$$(c) N \cdot \binom{n}{x} p^x q^{n-x} \quad (d) N \cdot \binom{n}{x} p q^{n-x}$$

29. The experiment is repeated a _____ number of times.

- (a) Times
 (b) Fixed
 (c) Expansion
 (d) Trial

If 5 dice are rolled 96 times then $N = \underline{\hspace{2cm}}$

- (a) $\frac{5}{96}$
 (b) $\frac{96}{5}$
 (c) $\frac{96}{5}$
 (d) $\frac{5}{96}$

30. If _____ then the distribution is positively skewed.

- (a) $p < q$
 (b) q/p
 (c) $p > q$
 (d) $p > \frac{1}{2}$

What is the mean of binomial distribution $\underline{\hspace{2cm}}$

- (a) \bar{X}
 (b) $n \times p$
 (c) $n(1 - 1)$
 (d) $\frac{\sum fx}{\sum f}$

31. There are _____ parameter in Binomial distribution

- (a) n, q
 (b) n, p, q
 (c) q, p
 (d) n, p

The binomial distribution is positively skewed when: $\underline{\hspace{2cm}}$

- (a) $p > q$
 (b) $p < q$
 (c) $p = q$
 (d) both (a) and (b)

32. For a binomial distribution.
 (a) n must assume a number between 1 and 20 or $\underline{\hspace{2cm}}$
 (b) p must be a multiple of .10
 (c) There must be at least 3 possible outcomes
 (d) None of these

33. Binomial word discovered at the end of $\underline{\hspace{2cm}}$

- (a) 14th century
 (b) 12th century
 (c) 10th century
 (d) 17th century

The binomial distribution is symmetrical when: $\underline{\hspace{2cm}}$

- (a) $p > q$
 (b) $P = 1/2$
 (c) Probability of success & probability of failure are equal
 (d) Both (b) & (c) but not (a)

34. If a Binomial experiment is repeated 'N' times the binomial frequency distribution is. $\underline{\hspace{2cm}}$

- (a) $N \cdot \binom{n}{x} p^x q^{n-x}$
 (b) $N p q$

35. If in binomial distribution $p \neq q$, the distribution is: $\underline{\hspace{2cm}}$

- (a) Positively skewed
 (b) Negatively skewed

- (c) May be positively skewed or negatively skewed
 (d) None of these

- (c) Become symmetrical.
 (d) All of the above.

40. Which of the following case is true for hyper geometric distribution? _____
 (a) Probability remains constant for all the trials
 (b) Probability changes from trial to trial
 (c) Successive trials are dependent
 (d) Both (b) & (c) but not (a)
41. The sum of p and q is always: _____
 (a) 0 (b) 2
 (c) 1 (d) None of these
42. In a binomial distribution, $n = 10$, $p = \frac{3}{5}$, its mean is: _____
 (a) 6 (b) 1
 (c) $\frac{2}{5}$ (d) None of these
43. What is the variance of binomial distribution _____
 (a) $n p$ (b) $np(1-p)$
 (c) $\frac{np}{q}$ (d) $\frac{nq}{p}$
44. For a binomial distribution with $n = 15$ as p changes from .50 toward .05 the distribution will
 (a) Become more positively skewed.
 (b) Become more negatively skewed.
45. Variance of binomial distribution is always _____
 (a) Less than mean (b) Greater than mean
 (c) Equal to mean (d) Less than equal to mean
46. When 'n' becomes very large, binomial distribution tends to _____
 (a) Poisson dist
 (b) Standard dist
 (c) Normal dist
 (d) Hypergeometric distribution
47. In a binomial distribution, $n = 20$ and $p = \frac{3}{5}$, then variance of this distribution _____
 (a) 60 (b) 12
 (c) 4.8 (d) 0
48. If mean of the binomial probability distribution is 4.8, then variance of this distribution is: _____
 (a) -2.3 (b) 5.3
 (c) -4.8 (d) 2.3
49. If in a binomial probability distribution mean and variance are 6 and 2.4 respectively, then the parameters of this distribution are: _____
 (a) $n = 10, p = \frac{6}{10}$ (b) $n = 50, p = \frac{6}{50}$

- (c) $n = 10, p = \frac{3}{5}$ (d) $n = 10, p = \frac{2}{5}$
 (e) pq

50. The mean and the variance are equal in

- (a) All probability distributions.
 (b) The hypergeometric distribution
 (c) The binomial distribution
 (d) The Poisson distribution

51. Which of the following is not a condition of the binomial distribution?

- (a) Only 2 possible outcomes
 (b) Have constant probability of success
 (c) Must have at least 3 trials
 (d) Trials must be independent

52. The probability of success changes from trial to trial in:

- (a) Binomial distribution
 (b) Geometric distribution
 (c) Sampling distribution
 (d) Hypergeometric distribution

53. The successive trials are with replacement in: _____
 (a) Hypergeometric distribution
 (b) Binomial distribution
 (c) Geometric distribution
 (d) None of above
54. The mean of binomial distribution is: _____
 (a) np (b) np _____
55. In a binomial probability distribution it is impossible to find:
 (a) $P(X < 0)$ (b) $P(X = 0)$
 (c) $P(X > 0)$ (d) $P(0 \leq X \leq n)$
56. The variance of binomial distribution is always: _____
 (a) Less than mean (b) Equal to mean
 (c) Greater than mean (d) Equal to standard deviation
 (e) None of these
58. Hypergeometric distribution has parameter: _____
 (a) 2 (b) 1
 (c) 3 (d) 4
 (e) No
59. Which of the following is not the property of binomial distribution?
 (a) n is fixed
 (b) Has two outcomes
 (c) Trials are independent

- (d) Probability of success varies from trial to trial _____
60. Binomial distribution has parameters: _____
- Three
 - Two
 - One
 - Four
 - None
61. The mean of hypergeometric distribution is: _____
- Nk/N
 - $N-k/n$
 - nN/k
 - $n+k/N$
62. Binomial distribution is negatively skewed when: _____
- $p=0$
 - $p \geq 1/2$
 - $p=1/3$
 - $p=1/2$
63. In hypergeometric distribution, the trials are: _____
- Independent
 - Dependent
 - Collectively Exhaustive
 - None
64. The mean, median and mode for binomial distribution will be equal when: _____
- $p = 0.5$
 - $p < 0.5$
 - $p > 0.5$
 - None of these
65. In which distribution successive trials are without
- Replacement: _____
- Hypergeometric distribution
 - Binomial distribution
 - Poisson distribution
 - Geometric distribution
66. If in a binomial distribution $n = 1$ then $E(X)$ is: _____
- q
 - p
 - 0
 - 1
67. A random variable X has binomial distribution with $n = 10$ and $p = 0.3$ then variance of X is: _____
- 10
 - 12
 - 2.1
 - 21
 - None
68. Each trial in Binomial distribution has: _____
- One Outcome
 - Two Outcome
 - Three Outcome
 - Four Outcome
69. In binomial distribution $n=6$ and $p=0.9$, then the value of: _____
- $P(X=7)$ is
 - One
 - Less than zero
 - More than zero
 - Zero
70. Successive trials in binomial distribution are: _____
- Dependent
 - Independent
 - Equally Likely
 - Mutually exclusive
 - Non

ANSWERS

1. (a)	2. (c)	3. (d)	4. (c)	5. (c)	6. (a)	7. (b)	8. (c)
9. (b)	10.(b)	11. (b)	12.(c)	13.(b)	14. (c)	15. (b)	16. (c)
17.(a)	18.(a)	19. (a)	20.(c)	21.(d)	22. (c)	23. (b)	24. (c)
25.(b)	26.(b)	27.(d)	28.(d)	29.(b)	30. (a)	31. (d)	32. (d)
33.(d)	34.(a)	35.(b)	36.(b)	37.(b)	38.(d)	39.(c)	40. (d)
41.(c)	42.(a)	43. (b)	44. (a)	45.(a)	46. (c)	47.(c)	48. (d)
49.(c)	50.(d)	51. (c)	52. (d)	53.(b)	54. (b)	55. (a)	56. (a)
57.(a)	58.(c)	59. (d)	60. (b)	61.(a)	62. (b)	63. (b)	64. (a)
65. a)	66.(b)	67. (c)	68. (b)	69.(c)	70. (b)		

where:

$x_1 = \#$ ()
 $x_2 = \#$ ()
 $x_3 = \#$ ()
 $a = \text{total}$

Chapter 9

NORMAL DISTRIBUTION

SELECT APPROPRIATE ANSWER

1. Normal distribution is a probability distribution of _____ random variable.
(a) Continuous (b) Constant
(c) Discrete (d) Normal
2. In a normal distribution quartile deviation is _____ (S.D.)
(a) .2745 (b) .3789
(c) .79079 (d) .6745
3. Normal distribution has _____ parameter.
(a) Three (b) Two
(c) Four (d) One
4. The _____ order moments about mean are all zero.
(a) None (b) Four
(c) Add (d) Even
5. The quartile deviation is _____ (S.D.) is normal dist.
(a) .6734 (b) .7879

- Emporium: MCQ - Statistics**
6. If $n \geq 30$ and _____ then binomial approaches _____
 (a) q/p (b) $p = q$
 (c) pq (d) $p = n$
7. In normal distribution $u_2 = S^2$ and $u_4 =$ _____
 (a) $3S^2$ (b) $3S$
 (c) $3S^4$ (d) $\frac{4S^2}{\bar{X}}$
8. In normal distribution $Q_1 =$ _____
 (a) $u + .6745$ (S.D.) (b) $u - .7979$ (S.D.)
 (c) $u + .6745$ (S.D.) (d) $u - .6745$ (S.D.)
9. The equation of standard normal distribution is $f(x) =$ _____
 (a) $\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}x^2}$ (b) $\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}x^2}$
 (c) $\frac{1}{\sqrt{2\pi}}$ (d) $\frac{1}{\sigma\sqrt{2\pi}}$
10. Every distribution tends to _____ distribution.
 (a) Small (b) ∞
 (c) Large (d) Finite
11. Normal distribution has _____ shaped.
 (a) u-shaped (b) Bell shaped
 (c) T-shaped (d) Normal shaped
12. Standard normal variable Z is: _____
 (a) $\frac{x - \mu}{\sigma}$ (b) $\frac{\mu - x}{\sigma}$
 (c) $\frac{\sigma - x}{\mu}$ (d) $\frac{x - \sigma}{\mu}$
13. For a normal distribution having $\mu = 241$ and $\sigma = 2$,
 $P(X \geq 235)$ is: _____
 (a) 0.9986 (b) 0.5
 (c) 0.475 (d) 0.235
14. Area of normal distribution total is equal to _____
 (a) Two (b) One
 (c) Four (d) Three
15. In normal distribution, mean _____ = Mode.
 (a) Quartile (b) Mean deviation
 (c) Median (d) S.D.
16. $P(u - \sigma \leq x \leq u + \sigma) =$ _____
 (a) .6826 (b) .6743
 (c) .6745 (d) .2345
17. The shape of normal distribution does depend upon _____ and variance.
 (a) x (b) $\frac{S}{\sigma^2}$
 (c) u (d) $2u^2$
18. Normal distribution is the distribution of _____
 (a) Discrete r.v. (b) Continuous r.v.

- (c) Qualitative variable (d) Quantitative variable
19. Normal distribution has _____
 (a) 1 parameter (b) 2 parameters
 (c) 3 parameters (d) 4 parameters
20. If $X \sim N(\mu, \sigma^2)$ then $Z \sim$ _____
 (a) $N(0, \sigma^2)$ (b) $N(1, \sigma^2)$
 (c) $N(0, 1)$ (d) $N(1, 1)$
21. 100% of values lies in the limits are equal to _____
 (a) 40 and 60 (b) 20 and 70
 (c) 20 and 30 (d) 20 and 80
22. In a normal distribution, what is the z score associated with the mode?
 (a) -1 (b) 0
 (c) +1 (d) None of these
23. The range of normal distribution lies between _____
 (a) $-\infty$ to $+\infty$ (b) 0 to ∞
 (c) $-\infty$ to 0 (d) None of these
24. The standardized normal variate z means _____ away from the mean.
 (a) Mean (b) S.D.
 (c) Variance (d) None of these

25. $N(u, 2\sigma)$ means normally distributed with mean u and variance 2σ then $N(3\sigma, 4)$ means _____
 (a) 46 (b) 76
 (c) 36 (d) 47
26. Area to the right of ($z = 0$) is the area for _____ values of z.
 (a) Zero (b) Negative
 (c) Positive (d) None of these
27. In a standard normal distribution $z = 0$ corresponds to _____
 (a) Mean (b) S.D.
 (c) M.D. (d) Q.D.
28. Normal distribution is _____ distribution.
 (a) Symmetrical (b) non-symmetrical
 (c) +vely skewed (d) -vely skewed
29. As the normal distribution is symmetrical, its mean, median and mode are: _____
 (a) Coincide (b) Not equal
 (c) Different
30. Total area under the normal curve is _____
 (a) 100 (b) 1
 (c) 50% (d) 1%
31. The maximum of function is at _____
 (a) $X = \sigma^2$ (b) $X = \mu$

32. For +ve or -ve skewness, check the sign of _____
- β_1
 - μ_2
 - β_2
 - μ_3
33. If $\beta_1 = 0$ it means the distribution is _____
- Symmetrical
 - +vely skewed
 - vely skewed
34. In normal distribution $\beta_1 = 0$ and β_2 is equal to: _____
- 0.5
 - 1
 - 2
 - 3
35. In normal distribution Q.D. (quartile deviation) is equal to: _____
- σ
 - 0.7979σ
 - None of these
 - 0.6745 σ
36. If "X" is normally distributed with $\mu = 8$ and S.D. 4 then $P(6 \leq X \leq 10)$ may be: _____
- 0
 - 0.32
 - 1.2
 - 0.2684
37. P_{95} means: _____
- The central 95% area
 - The point above which 95% area lies
 - The point below which 95% area lies
 - Both (a) and (b) but not (c)
38. In a certain normal distribution having $\mu = 3.5$ and variance = 16, then mode will be: _____
- 3.5
 - 16
 - 4
 - None of these
39. The normal distribution is: _____
- Platykurtic
 - Leptokurtic
 - Mesokurtic
 - None of these
40. The value maximum ordinate of a standard normal curve at $Z = 0$ is: _____
- 1
 - 0.5
 - 0.3989
 - None of these
41. The area under the normal distribution curve outside the interval of $z=1$ and $z=3.09$ is
- None of the above
 - 0.1477
 - 0.1597
 - 0.3413
 - 0.4990
42. The shape of normal curve depends upon
- None
 - Mean
 - Quartile Deviation
 - Standard Deviation
 - Mean Deviation
43. Mean deviation of Normal Distribution is
- 45σ
 - 34σ
 - 78σ
 - 23σ

44. Which of the following parameter control the relative flatness of normal distribution

- (a) None

- (b) Mode

- (c) Standard Deviation

- (d) Mean

45. The median of normal distribution corresponds to the value of Z equal to

- (a) 0.5 (b) 1
(c) μ (d) 0

46. Area under the normal curve on either side of mean is

- (a) 1 (b) Mean value
(c) 0.5 (d) 2
(e) -1

47. If $X \sim N(55, 49)$ then σ

- (a) 7 (b) 55
(c) 104 (d) 49

48. If $Y = 5X + 10$ and X is $N(10, 25)$, then mean of Y is

- (a) 135 (b) 50
(c) 70 (d) 60

49. The lower and upper quartiles of standard normal variation are respectively

- (a) $\mu+0.6745\sigma$ and $\mu-0.6745\sigma$ (b) -0.6745 and 0.6745
(c) -0.7979 and 0.7979 (d) -0.7979σ and 0.7979σ

50. If $X \sim N(16, 49)$, then mean is

- (a) 49 (b) 16
(c) 7 (d) 4

51. Total Area under the normal curve is
(a) Greater than 1 (b) 1
(c) None (d) Less than 1
(e) 0

52. In case of symmetrical distribution
(a) $\beta_1=\beta_4$ (b) Mean=Mode=Median
(c) $\mu_3=\mu_4$ (d) $\mu_1=\mu_2$

53. We use normal distribution when "n" is
(a) Small (b) None
(c) Fixed (d) Large

54. Normal Distribution

- (a) Have no Mode (b) Multi Modal
(c) Bi Modal (d) Tri Modal
(e) Uni Modal

55. Shape of normal curve can be related to

- (a) Bell (b) Circle
(c) L (d) Rectangle
(e) J

56. The Normal Curve is asymptotic to the
(a) None (b) X-axis
(c) Y-axis (d) Along $Y=X$

57. In a normal distribution $E(X-\mu)^2$ is
(a) Variance (b) Mean Deviation
(c) Standard Deviation (d) Quartile Deviation

58. In Normal distribution, the parameters which controls the flatness of the curve is

- (a) μ, σ
- (c) $\mu, M.D$
- (b) None
- (d) $2\pi - \sqrt{e}$

ANSWERS

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

Explain importance of normal distribution.

Importance of Normal Distribution:

It is found to provide a reasonable approximation in different situations.

The real-life data must conform to the bell-shaped normal curve.

The normal distribution is very important role in statistics.

Inference procedures based on normal distribution provide as vital application.

It is also Important the use in graphical represent in the field of statistics.

PROPERTIES OF THE NORMAL DISTRIBUTION

it's a bell-shaped distribution.

The distribution is symmetrical.

It is a unimodel and have maximum ordinate of curve is at $x = u$ and its equal to $\frac{1}{\sqrt{2\pi}}$

The total area under the curve is unity.

It has points of inflection which occur at $u + \sigma$ and $u - \sigma$.

Q. Define normal distribution.

Question & Answers

Chapter 10

SAMPLING AND SAMPLING DISTRIBUTION

SELECT APPROPRIATE ANSWER

1. If the sampled population has a normal distribution, when is the sampling distribution of the sample mean \bar{X} also a normal distribution?
 - Only when the sample size is at least 100.
 - Only when the sample size is smaller than 30.
 - Always.
 - Only when the sample size is at least 30.
2. A sampling distribution is the probability distribution for which one of the following?
 - A sample
 - A sample statistic
 - A population
 - A population parameter
3. In w.o.r. $s^2_{\text{cr}} = \frac{\frac{2}{n} \sqrt{\frac{N-n}{N-1}}}{\sigma^2}$
 - $\frac{2}{\sqrt{n}} \sqrt{\frac{N-n}{N-1}}$
 - $\frac{\sigma}{\sqrt{n}} \sqrt{\frac{N-n}{N-1}}$
 - $\frac{2}{\sqrt{n}} \frac{N-n}{N-1}$
 - $\frac{2}{\sqrt{n}}$

6. In sampling with replacement, the population becomes _____.

(a) Finite

(b) Infinite

(c) Existent

(d) Hypothetical

6. Another name of non-probability sampling is _____.

(a) Non-random sampling

(b) Random sampling

(c) Simple random sampling

(d) None of these

7. A numerical characteristics calculated from sample is called _____.

(a) Sampling unit

(b) Sampling Design

(c) Parameter

(d) Statistic

8. In difference between two population proportion S.D. comparison is equal to $6p_1 - p_2$ _____.

(a) $p_1 \frac{(1-p_2)}{n_1}$

(b) $\frac{p_2 q_1}{n_1} + \frac{p_1 q_2}{n_2}$

(c) $\frac{p_1 q_1}{n_1}$

(d) $\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}$

9. Symbol of sample variance _____.

(a) s^2

(b) s

(c) s^2

(d) $\frac{s^2}{n}$

10. As the sample size _____ the variation of the sampling distribution of \bar{X} _____.

- (a) Decreases, decreases
- (b) Increase remain the same
- (c) Decreases, remains the same
- (d) Increases, decreases

11. A sample is a _____ of whole population.

- (a) Large
- (b) Small
- (c) Part

12. A whole consisting of object is called _____

- (a) Sample
- (b) With replacement
- (c) Population
- (d) Part

13. A population which consists of unlimited number of elements is called: _____

- (a) Finite population
- (b) Infinite population
- (c) Both (a) and (b)
- (d) None of these

14. The numerical values calculated from population are called: _____

- (a) Census
- (b) Parameters
- (c) Statistics
- (d) None of these

15. The numerical value calculated from sample is called: _____

- (a) Parameter
- (b) Population parameter
- (c) Statistic
- (d) Both (a) (b) but not (c)

16. _____ letters are used to denote parameters.

- (a) Random number
- (b) Probability
- (c) Latin
- (d) Greek

17. A cluster is a collection of units _____ in nature.

- (a) Found
- (b) Began
- (c) None of these
- (d) Large

18. In _____ sample individual judgment is used.

- (a) Find
- (b) Non-probability
- (c) Random
- (d) Judgment

19. A population about which information is required is called _____ population.

- (a) Target
- (b) Getting
- (c) Apart
- (d) None of these

20. The reliability of estimate is obtained by computing the _____ of a statistic.

- (a) Standard deviation
- (b) Standard error
- (c) Frame
- (d) Unit

21. All the possible shoes made in Bata shoes factory is the example of: _____

- (a) Finite population
- (b) Infinite population
- (c) Both (a) and (b)
- (d) None of these

22. Latest census in Pakistan was held in: _____

- (a) June 1981
- (b) March 1991
- (c) March 1998
- (d) January 2000

23. Each and every unit in the population is enumerated in: _____

- (a) Census
- (b) Sampling
- (c) Both (a) and (b)
- (d) None of these

24. The difference between a statistics and parameter is called _____

- (a) Sampling form
- (b) Sampling unit
- (c) Sampling error
- (d) Larger

25. A sample is selected by _____

- (a) w.o.r.
- (b) Population
- (c) Whole
- (d) With replacement

26. A measure of the population is called _____

- (a) Sample
- (b) Statistics
- (c) Parameter
- (d) Error

27. Sampling error can be reduced by _____ the sample size.

- (a) Decreasing
- (b) Large
- (c) Increasing
- (d) Equal

28. The population divided into a number of non-overlapping groups are called _____

- (a) Quota sampling
- (b) Random sampling
- (c) Stratum sampling
- (d) Sampling frame

29. Sampling is the process of _____ a part from the whole.

- (a) Selecting
- (b) Randomly
- (c) A group
- (d) Survey

30. Selection of questions by the students to solve a paper is _____

- (a) Random sampling
- (b) Non-random sampling
- (c) Prob.Sampling
- (d) Sampling with replacement

31. In the sampling without replacement a sampling unit can be selected _____

- (a) Only once
- (b) More than once
- (c) Less than once
- (d) None of these

32. Non-random sampling is also called _____

- (a) Biased sampling
- (b) Non-prob. sampling
- (c) Less than sampling
- (d) Representative sampling

33. Probability distribution of a statistics is called _____

- (a) Sampling
- (b) Parameter
- (c) Data
- (d) Sampling distribution

34. The smallest individuals which constitute the entire population are called _____

- (a) Sampling frame
- (b) Sampling units
- (c) Sample pop.
- (d) Sample design

35. To purchase the fruits, we use the _____ sampling.

- (a) Systematic
- (b) Cluster
- (c) Stratified
- (d) Judgment

36. $\frac{N-n}{N-1}$ is called _____ population.

- (a) Group
- (b) Finite
- (c) Un-finite
- (d) Correction

37. There are _____ probability sampling.

- (a) Four
- (b) Six
- (c) Three
- (d) Seven

38. A list of sampling _____ is called sampling frame.

- (a) Point
- (b) w.r.m.
- (c) w.o.r.
- (d) unit

39. The process of selecting sample from the population is called _____

- (a) Sampling process
- (b) Sampling unit
- (c) Sampling
- (d) Size

40. In probability sampling each sampling unit has some _____

- (a) Unknown
- (b) Large
- (c) Small
- (d) Know

41. Sampling error can be reduced by _____

- (a) Non-random sampling
- (b) Increasing the population
- (c) Decreasing the sample size
- (d) Increasing the sample size

If in a sampling distribution of \bar{X} the sample size is 42. _____ assumption must hold for the sampling what distribution of \bar{X} to be normal?

- (a) Population distribution is normal
- (b) $\mu_x = \mu_n$
- (c) Population distribution is uniform

$$(d) \sigma_x = \sigma / \sqrt{n}$$

43. In sampling with replacement a sampling unit can be selected _____

- (a) Only once
- (b) More than once
- (c) Less than once
- (d) None

44. Standard deviation of the sampling distribution of a statistics is called _____

- (a) Serious error
- (b) Dispersion
- (c) Standard error
- (d) Difference

45. Non-sampling errors are reduced by: _____

- (a) Increasing the sample size
- (b) Reducing the amount of data
- (c) Decreasing the sample standard deviation
- (d) None of these

46. Sampling errors are reduced by: _____

- (a) Increasing the sample size
- (b) Decreasing the sample size
- (c) Increasing population s.d.
- (d) None of these

47. The difference between statistics and parameters is called: _____

- (a) Bias
- (b) Standard error
- (c) Sampling error
- (d) both (a) and (b)

48. For making voters lists in Pakistan we need: _____

- (a) Simple random sampling
- (b) Systematic sampling
- (c) Quota sampling
- (d) Census

49. If we increase the sample size, it means that it: _____

- (a) Increases the standard error
- (b) Decreases the standard error
- (c) Decreases the sampling error
- (d) Both (a) and (b)

50. Which of the following is impossible in sampling?

- (a) Destructive tests
- (b) Heterogeneous data
- (c) To make voters lists
- (d) None of these

51. For a population consisting of 4 members, a sample of size '2' is taken with replacement, then the number of all the possible samples are:

- (a) 4
- (b) 8
- (c) 16
- (d) 32

52. The process of dividing a heterogeneous

- (a) Random digit
- (b) Stratification
- (c) Random sampling
- (d) Cluster

53. A sample estimate is used to describe a characteristic of a _____

- (a) Sample
- (b) Data
- (c) Population
- (d) None

54. The standard deviation of sampling distribution of a statistics is _____

- (a) Standard error of statistics
- (b) Sampling error of statistics
- (c) Sampling distribution of statistics
- (d) None of these

55. Convenience sampling is an example of

- (a) Probabilistic sampling
- (b) Stratified sampling
- (c) No probabilistic sampling
- (d) Cluster sampling

56. The sampling error is the _____

- (a) Same as the standard error of the mean
- (b) Difference between the value of the sample mean

and the

value of the population mean

- (c) Error caused by selecting a bad sample
- (d) Standard deviation multiplied by the sample size

57. For a population with any distribution, the form of the sampling distribution of the sample mean is

- (a) Sometimes normal for all sample sizes
- (b) Sometimes normal for large sample sizes
- (c) Always normal for all sample sizes
- (d) Always normal for large sample sizes

ANSWERS

58. A sample of 24 observations is taken from a population that has 150 elements. The sampling distribution of is
- Approximately normal because is always approximately normally distributed
 - Approximately normal because the sample size is large in comparison to the population size
 - Approximately normal because of the central limit theorem
 - Normal if the population is normally distributed
59. A sample of 92 observations is taken from an infinite population. The sampling distribution of is approximately
- Normal because is always approximately normally distributed
 - Normal because the sample size is small in comparison to the population size.
 - Normal because of the central limit theorem
 - None of these alternatives is correct.
60. Random samples of size 17 are taken from a population that has 200 elements, a mean of 36, and a standard deviation of 8. Which of the following best describes the form of the sampling distribution of the sample mean for this situation?

Question & Answers

1. (c)	2. (b)	3. (c)	4. (c)	5. (b)	6. (a)	7. (d)	8. (d)
9. (c)	10. (d)	11. (c)	12. (c)	13. (b)	14. (b)	15. (c)	16. (d)
17. (a)	18. (d)	19. (a)	20. (b)	21. (b)	22. (c)	23. (a)	24. (c)
25. (d)	26. (c)	27. (c)	28. (c)	29. (a)	30. (b)	31. (a)	32. (b)
33. (d)	34. (b)	35. (d)	36. (b)	37. (a)	38. (c)	39. (c)	40. (d)
41. (d)	42. (a)	43. (b)	44. (c)	45. (b)	46. (a)	47. (c)	48. (d)
49. (d)	50. (c)	51. (c)	52. (b)	53. (a)	54. (a)	55. (c)	56. (b)
57. (d)	58. (d)	59. (c)	60. (d)				

Question & Answers

- (a) Approximately normal because the sample size is small relative to the population size
- (b) Approximately normal because of the central limit theorem
- (c) Exactly normal
- (d) None of these alternatives is correct.

Q. Define sample.

Ans. In statistics this term is used for any finite or infinite collection of 'units', which are often people but may be, for example, institutions, events, etc.

Q. Define population.

Ans. A selected subset of a population chosen by some process usually with the objective of investigating particular properties of the parent population.

Chapter 11

STATISTICAL INFERENCE AND ESTIMATION

SELECT APPROPRIATE ANSWER

1. A _____ is the specific value of the statistics used to estimate the population parameter.
 - (a) Point estimator
 - (b) C.I.
 - (c) Estimator
 - (d) None of these
2. An estimator Q is an unbiased estimator of the population parameter Q if _____.
 - (a) $E(X) = \mu$
 - (b) $E(Q) = Q$
 - (c) $E(Q) = Q$
 - (d) $E(P) = P$
3. Since $E(X) = \mu$. X is said to be unbiased estimator of the population mean.
 - (a) Q
 - (b) X
 - (c) U_x
 - (d) u
4. Sample proportion P is _____ estimator
 - (a) Biased
 - (b) Parameter
 - (c) Unbiased
 - (d) None of these

5. Sample variance S^2 is unbiased estimator of population variance σ^2 because _____
- $E(S^2) = \sigma^2$
 - $E(u) = X$
 - $E(P) = P$
 - $U_x = u$
6. Sampling Error decrease by _____ the sample size.
- Increase
 - Decrease
 - Sampling
 - Population
7. x = 40 is an estimate of _____
- (U)
 - 6
 - U_x
 - $\frac{6}{\sqrt{n}}$
8. _____ is a value of sample statistics.
- Estimate
 - Estimator
 - Probability
 - Numerical
9. _____ is an estimate expressed by a single value.
- C.I.
 - Point estimator
 - Parameter
 - Point estimate
10. _____ is the process of using sample information to reach
- Population
 - Biased
 - Unbiased
 - Increase

11. The Estimation and testing of hypothesis are main branches of _____
- Sampling
 - Probability distribution
 - Regression
 - Statistical Inference
12. The minimum variance unbiased estimator of the population mean is _____
- $\frac{6}{\sqrt{n}}$
 - $\frac{S}{\sqrt{n}}$
 - $\frac{S^2}{n}$
 - $\frac{6}{\sqrt{n}}$
13. 95% confidence limits u are _____
- $\bar{x} \pm 1.65 \frac{6}{\sqrt{n}}$
 - $u \pm 1.95 \frac{S}{\sqrt{n}}$
 - $\bar{x} \pm 1.96 \frac{6}{\sqrt{n}}$
 - $1.96 \pm \frac{6}{\sqrt{n}}$
14. 95% Confidence limits for P are _____
- $P \pm 2.18 \sqrt{\frac{P^2 q^2}{n}}$
 - $\hat{P} \pm 1.65 \left(\frac{Pq}{n} \right)$
 - $\hat{P} \pm 1.96 \frac{P^2 q^2}{\sqrt{n}}$
 - $\hat{P} \pm 1.96 \sqrt{\frac{P^2 q^2}{n}}$
15. $E(\bar{x}_1 - \bar{x}_2) =$ _____
- $u - \bar{x}_2$
 - $u^1 - u^2$
 - $6_{\bar{x}_1} - \bar{x}_2$
 - $6_{\bar{x}_1} - \bar{x}_2$
16. The Hypothesis which is being tested is called _____
- Composite hypothesis

17. Which of the following is simple hypothesis
 (a) $u = 20$ (b) $u \neq 20$
 (c) $u < 20$ (d) $u > 20$
18. Type II error is committed when the null hypothesis is _____
 (a) Rejected when it is true
 (b) Rejected when it is false
 (c) Accepted when it is true
 (d) Accepted when it is false
19. If $n = 400$ and $P = .69$ then 90% C.I. for P is _____
 (a) 652 and .728 (b) .314 and .652
 (c) .798 and .745 (d) None of these
20. Which of the following cannot be H_0 _____
 (a) $Q \leq Q_0$ (b) $Q \geq Q_0$
 (c) $Q = Q_0$ (d) $Q \neq Q_0$
21. The level of significance is denoted by _____
 (a) $1 - \alpha$ (b) β
 (c) α (d) $1 - \beta$
22. If H_0 is stated as $Q = Q_0$ the alternate hypothesis in general stated _____
 (a) $Q < Q_0$ (b) $Q > Q_0$
 (c) $Q \neq Q_0$ (d) None of these
23. The values that separate the region of rejection and acceptance region are called _____
 (a) Critical value (b) Confidence limits
 (c) Confidence boundaries (d) None of these
24. The first and starting point in test hypothesis is _____
 (a) Stating H_1 (b) Stating H_0
 (c) L. of significance (d) Test statistics
25. Power of test is denoted by _____
 (a) β (b) α
 (c) $(1 - \alpha)$ (d) $1 - \beta$
26. A quantity obtained by applying certain rule or formula is known as _____
 (a) Estimate (b) Test Statistics
 (c) Estimation (d) Sample
 (e) Estimator
27. Criteria to check a point estimator to be good are
 (a) Consistency (b) All Above
 (c) Unbiasedness (d) Efficiency

28. $1 - \alpha$ is the probability of
 (a) Acceptance Region (b) Type-I Error
 (c) Type-II Error (d) Rejection Region
29. Parameter is a _____ quantity
 (a) Constant (b) Variable
30. Consistency of an estimator can be checked by
 (a) Standard Deviation (b) Mean
 (c) Mean Square Error (d) Variance
31. If we reject the null hypothesis, we might be making
 (a) Unpredictable (b) A correct Decision
 (c) Type-II Error (d) Type-Error
32. Herbicide A has been used for years in order to kill a particular type of weed. An experiment is to be conducted in order to see whether a new herbicide, Herbicide B, is more effective than Herbicide A. Herbicide A will continue to be used unless there is sufficient evidence that Herbicide B is more effective. The alternative hypothesis in this problem is
 (a) Herbicide A is more effective than Herbicide B
 (b) Herbicide A is not more effective than Herbicide B
 (c) Herbicide B is more effective than Herbicide A
 (d) Herbicide B is not more effective than Herbicide A
33. Analysis of Variance (ANOVA) is a test for equality of
 (a) Variances (b) Proportions
 (c) Only two parameters (d) Means
34. Which of the following is an assumption underlying the use of the t-distributions?
 (a) The samples are drawn from a normally distributed population
 (b) The variance of the population is known
 (c) All above
 (d) s (sample standard deviation) is an unbiased estimate of the population variance.
35. For t distribution, increasing the sample size, the effect will be on?
 (a) Standard Error of the Means (b) The t-ratio
 (c) Degrees of Freedom (d) All Above
36. The t distributions are
 (a) Symmetrical (b) None of these t
 (c) Same as Normal Curve (d) Skewed
37. Condition for applying Central Limit Theorem (CLT) which approximates the sampling distribution of the mean with a normal distribution is?
 (a) $n > 30$ (b) $N(1 - p) > 5$
 (c) $2n < N$ (d) $nN > 5$

38. Which of the following is a true statement for comparing the t distributions with standard normal.

- (a) Greater the degree of freedom, the more the t -distribution resembles the standard normal distribution
- (b) The Normal Curve is symmetrical whereas the t -distributions are slightly skewed
- (c) The proportion of area beyond a specific value of " t " is less than the proportion of normal curve

39. What is the probability of a type II error when $\alpha=0.05$?

- (a) 0.025
- (b) 0.95
- (c) 0.05
- (d) Cannot be determined without more information

40. The critical value of a test statistic is determined from

- (a) The sampling distribution of the statistics assuming Null Hypothesis.
- (b) Calculations based on many actual repetitions of the same Experiment.
- (c) The sampling distribution of the statistic assuming Alternative Hypothesis.

41. The Mann-Whitney U test is preferred to a t-test when

- (a) Sample are dependent
- (b) The assumption of normality is not met
- (c) Sample sizes are small
- (d) Data are paired

42. In testing for the difference between two populations, it is possible to use

- β . The sign test assumes that the
- (a) Samples are independent
 - (b) Samples have same mean
 - (c) Samples are dependent
 - (d) The Wilcoxon Signed Rank test is used

44. The Runs test results in rejecting the null hypothesis of randomness when

- (a) There is an unusually large number of runs
- (b) There is an unusually small number of runs
- (c) None of these
- (d) Either of the above

45. Three brands of coffee are rated for taste on a scale of 1 to 10. Six persons are asked to rate each brand so that there is a total of 18 observations. The appropriate test to determine if three brand

taste equally good is

- (a) One way analysis of variance (ANOVA)
- (b) Spearman Rank difference
- (c) Wilcoxon Rank-Sum test
- (d) Kruskal-Wallis test

46. Comparing the times to failure of radar transponders made by firms A, B, and C based on an airline's sample experience with the three types of instruments one may use

47. To perform a Runs test for randomness the data must be
 (a) Divided into at least two classifications
 (b) Divided into exactly two classification
 (c) Quantitative
 (d) Qualitative
48. The Wilcoxon Rank-Sum test used to compares
 (a) Any number of populations
 (b) A sample mean to the population mean
 (c) Two populations
 (d) Three Populations
49. The Spearman Rank-Correlation test requires that the
 (a) Data must be measured on the same scale
 (b) Data should be of ordinal scale at least
 (c) Data must be distributed at least approximately as a t-distribution
 (d) Data must be from two independent samples
50. Which of the following test must be two-sided?
 (a) Sign test
 (b) Wilcoxon Signed Rank
 (c) Kruskal-Wallis
 (d) Runs test
51. In a Wilcoxon Rank-Sum test
 (a) Ties within one sample may affect the decision
 (b) Ties always affect the decision
 (c) Ties never affect the decision
 (d) Ties between the two samples may affect the decision
52. Which of the following tests is most likely assessing this null hypothesis: H_0 : The number of violations per apartment in the population of all city apartments is binomially distributed with a probability of success in any one trial of $P=0.3$?
 (a) The Mann-Whitney test
 (b) The Kruskal-Wallis test
 (c) The Wilcoxon Signed Rank test
 (d) The Kolmogorov-Smirnov test
53. When using the sign test, if two scores are tied, then
 (a) We count them
 (b) We discard them
 (c) We depends upon the scores
54. When testing for randomness, we can use
 (a) Sign test
 (b) None of these
 (c) Runs test
 (d) D Mann-Whitney U test
55. Wilcoxon Rank-Sum test can be of
 (a) Lower tailed
 (b) Upper tailed
 (c) Either of the above
 (d) None of the above
56. The non parametric equivalent of an unpaired samples t-test
 (a) Kruskal Wallis Test
 (b) Mann-Whitney U test

- (c) Wilcoxon signed rank test (d) Sign test

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- (c) Maximum Likelihood function (d) Likelihood function

57. Which of the following test use Rank Sums

- (a) Kruskal-Wallis and Wilcoxon tests
- (b) Runs test
- (c) Chi-Square and Sign tests
- (d) F test

58. Let X_1, X_2, \dots, X_n be a random sample from a density, $f(x|\theta)$, where θ is a value of the random variable Θ with

known density $g(\Theta|\theta)$. Then the estimator $t(\theta)$ with \therefore respect to the prior $g(\Theta|\theta)$ is define as $\dots \dots \dots \dots \dots \dots$ $E[t(\theta)|X_1, X_2, \dots, X_n]$ is called

- (a) Posterior Bay's estimator
- (b) Minimax estimator
- (c) Bay's estimator
- (d) Sufficient estimator

59. If $f(x_1, x_2, \dots, x_n; \theta) = g(\theta^\wedge; \theta)h(x_1, x_2, \dots, x_n)$, then θ^\wedge is

- (a) Consistent
- (b) Sufficient
- (c) Efficient
- (d) Unbiased

60. If $\text{Var}(T_2) < \text{Var}(T_1)$, then T_2 is

- (a) Efficient
- (b) Sufficient
- (c) Unbiased
- (d) Consistent

61. if $\text{Var}(\theta^\wedge) \rightarrow 0$ as $n \rightarrow 0$, then θ^\wedge is said to be

- (a) Sufficient
- (b) Efficient
- (c) Unbiased
- (d) Consistent

62. If X_1, X_2, \dots, X_n is the joint density of n random variables,

say, $f(X_1, X_2, \dots, X_n; \theta)$ which is considered to be a function of θ then $L(\theta; X_1, X_2, \dots, X_n)$ is called

- (a) Marginal function
- (b) Log function

63. If the conditional distribution of X_1, X_2, \dots, X_n given $S=s$, does not depend on θ , for any value of $S=s$, the statistics $S_s(X_1, X_2, \dots, X_n)$ is called

64. Let X_1, X_2, \dots, X_n be a random sample from the density $f(x|\theta)$, where θ may be vector. If the conditional distribution of X_1, X_2, \dots, X_n given $S=s$ does not depend on θ for any value of s of S , then statistic is called.
- (a) Minimal sufficient statistic
 - (b) Sufficient statistic
 - (c) Sufficient estimator
 - (d) Minimax statistics

65. If $E(\theta^\wedge) = \theta$, then θ^\wedge is said to be

- (a) Unbiased
- (b) Consistent
- (c) Sufficient
- (d) Efficient

66. Let Z_1, Z_2, \dots, Z_n be independently and identically distributed random variables, satisfying $E|Z_i| < \infty$. Let N be an integer valued random variable whose value n depends only on the values of the first n Z_i 's. Suppose $E(N) < \infty$, then $E(Z_1 + Z_2 + \dots + Z_n) = E(N)E(Z_i)$ is called

- (a) Independence Equation
- (b) Sequential Probability Likelihood Equation
- (c) Neyman Pearson Lemma
- (d) Wald's Equation

ANSWERS

- (a) Unbiased
 (b) Sufficient
 (c) Consistent
 (d) Efficient

68. For a biased estimator $\hat{\theta}$ of θ , which one is correct

- (a) $MSE(\hat{\theta}) = SD(\hat{\theta}) + \text{Bias}$
 (b) $MSE(\hat{\theta}) = \text{Var}(\hat{\theta}) + \text{Bias}^2$
 (c) $MSE(\hat{\theta}) = SD(\hat{\theta}) + \text{Bias}^2$
 (d) $MSE(\hat{\theta}) = \text{Var}(\hat{\theta}) + \text{Bias}$

69. A test is said to be most powerful test of size α , if

- (a) Among all other test of size α or less it has the largest power
 (b) Among all other test size α or greater it has the largest $1 - \alpha$
 (c) Among all other test of size α or greater it has the smallest power
 (d) Among all other test of size α or greater it has the largest β

70. A set of jointly sufficient statistics is defined to be minimal sufficient if and only if

- (a) It is a function of some other set of sufficient statistics.
 (b) It is a function of every other set of sufficient statistics in the set.
 (c) It is a function of any sufficient statistics in the set.
 (d) It is not a function of every other set of sufficient statistics.

Question & Answers

Q. What is statistical inference?

Ans. Statistical Inference makes use of information from a sample to draw conclusions (inferences) about the population from which the sample was taken.

Q. Define estimation.

Ans. Estimation is the process by which sample data are used to indicate the value of an unknown quantity in a population. Results of estimation can be expressed as a

1.(a)	2. (b)	3. (d)	4. (c)	5. (c)	6. (d)	7. (a)	8. (a)
9. (d)	10.(c)	11.(d)	12.(c)	13.(c)	14.(d)	15.(b)	16.(c)
17.(a)	18.(d)	19.(a)	20.(d)	21.(c)	22.(c)	23.(a)	24.(b)
25.(d)	26. (a)	27. (b)	28. (a)	29. (a)	30. (d)	31. (d)	32. (c)
33. (a)	34. (a)	35. (d)	36. (a)	37. (a)	38. (a)	39. (d)	40. (c)
41. (b)	42. (d)	43. (c)	44. (d)	45. (d)	46. (d)	47. (b)	48. (c)
49. (b)	50. (a)	51. (a)	52. (d)	53. (b)	54. (c)	55. (c)	56. (b)
57. (a)	58. (a)	59. (b)	60. (a)	61. (d)	62. (d)	63. (b)	64. (a)
65. (a)	66. (a)	67. (b)	68. (b)	69. (a)	70. (b)		

Chapter 12

HYPOTHESIS TESTING

SELECT APPROPRIATE ANSWER

1. Statistical inference is divided into two major branches given below: _____
 - (a) Point estimation and hypothesis testing
 - (b) Interval estimation and hypothesis testing
 - (c) Hypothesis testing and estimation
 - (d) None of these

2. The probability of accepting the true null hypothesis is called: _____
 - (a) Level of significance (b) Level of confidence
 - (c) Both (a) and (b) (d) None of these

3. The probability of rejecting a true null hypothesis is called: _____
 - (a) Level of significance (b) Type-I error
 - (c) Type-II error (d) None of these

4. If a false hypothesis is accepted, it is called: _____
 - (a) Level of significance (b) Type-I error
 - (c) Type-II error (d) Level of confidence

5. A hypothesis which enables us to decide whether accept or reject a statement about population parameter is called: _____
 - (a) Estimation (b) Testing of hypothesis
 - (c) Statistical inference (d) Confidence interval

6. An assumption formulate about population parameter which may or may not be true, is called: _____
 - (a) Statistical hypothesis (b) Confidence interval
 - (c) Critical region (d) Level of significance

7. Any true assumption which is to be tested for possible rejection is called: _____
 - (a) Simple hypothesis (b) Composite hypothesis
 - (c) Null hypothesis (d) Alternative hypothesis

8. The complement of null hypothesis is: _____
 - (a) Simple hypothesis (b) Composite hypothesis
 - (c) Null hypothesis (d) Alternative hypothesis

9. A hypothesis which completely specifies all the parameters of the distribution is called: _____
 - (a) Simple hypothesis (b) Composite hypothesis
 - (c) Null hypothesis (d) Alternative hypothesis

10. A hypothesis which does not completely specify all the parameters of the distribution is called: _____
 - (a) Simple hypothesis (b) Composite hypothesis
 - (c) Null hypothesis (d) Alternative hypothesis

11. Testing of hypothesis is a type of _____
 (a) Estimation (b) Confidence interval
 (c) Statistical inference (d) Level of confidence
12. Hypothesis testing and estimation are: _____
 (a) Identical (b) Same
 (c) Different (d) Both (a) and (b)
13. The hypothesis which is tested for possible purpose of rejection is called: _____
 (a) Simple hypothesis (b) Composite hypothesis
 (c) Null hypothesis (d) Alternative hypothesis
14. In testing of hypothesis, the sampling distribution of the test statistics is based on the assumption that: _____
 (a) H_0 is true (b) H_0 is false
 (c) H_1 is true (d) H_1 is false
15. _____ the sample statistics which provides a basis for deciding whether or not the null hypothesis should be rejected is called
 (a) Z-test (b) Test statistics
 (c) Standardized variable (d) \bar{X}, S^2, S^2 etc.
16. Z, T, F, x^2 are commonly used _____
 (a) Testing of hypothesis procedures
 (b) Test statistics
 (c) Distribution functions
 (d) None of these
17. A region which specifies a set of values of test statistics for which the null hypothesis is rejected is called _____
 (a) Acceptance region (b) Non-rejection region
 (c) Rejection region (d) None of these
18. Rejection region is also called _____
 (a) Acceptance region (b) Non-rejection region
 (c) Critical region (d) None of these
19. The region which specifies a set of values of the test statistics for which the null hypothesis is not rejected is called _____
 (a) Acceptance region (b) Critical region
 (c) Rejection region (d) None of these
20. Acceptance region is also called _____
 (a) Rejection region (b) Non-rejection region
 (c) Critical region (d) None of these
21. The values of test statistics which separate the rejection and non-rejection regions for the test are called _____
 (a) Critical values
 (b) Values lie in rejection region
 (c) Values lie in acceptance
 (d) None of these

22. The ratio of sampling error to the standard error a(n) _____
- Confidence interval
 - Estimation
 - Test statistics
 - None of these
23. If $H_0 : \theta \leq \theta_0$ then H_1 : _____
- $\theta \neq \theta_0$
 - $\theta > \theta_0$
 - $\theta < \theta_0$
 - None of these
24. The number of independent or freely chosen variables is called _____
- Degree of freedom
 - Sample size (n)
 - Size of the population
 - Sample length
25. If population is normal and S.D. is unknown and n > 30, we must apply _____
- Z-test
 - T-test
 - F-test
 - χ^2 -test
26. In t-test we use: _____
- Population variance
 - Biased sample variance
 - Unbiased sample variance
 - Both (a) and (b)
27. For testing of hypothesis about population proportion we use: _____
- Z-test
 - T-test
 - χ^2 -test
 - Both (a) (b)
28. The librarian at the Library of Congress has asked her assistant for an interval estimate of the mean number of books checked out each day. The assistant took a sample and found the mean to be 880 books. She provides the librarian with an interval estimate of between 790 and 970 books checked out per day. An efficient, unbiased point estimate of the number of books checked out each day at the Library of Congress is:
- 790
 - 880
 - 90
 - None of these choices
29. After constructing a confidence interval estimate for a population mean, you believe that the interval is useless because it is too wide. In order to correct this problem, you need to:
- Increase the population standard deviation.
 - Increase the sample size.
 - Increase the level of confidence.
 - Increase the sample mean.
30. A Type I error is committed if we make:
- A correct decision when the null hypothesis is false.
 - A correct decision when the null hypothesis is true.
 - An incorrect decision when the null hypothesis is false.
 - An incorrect decision when the null hypothesis is true.
31. The hypothesis of most interest to the researcher is:
- The alternative hypothesis.
 - The null hypothesis.
 - Both hypotheses are of equal interest.
 - Neither hypothesis is of interest.

32. A Type II error is defined as:

- (a) Rejecting a true null hypothesis.
- (b) Rejecting a false null hypothesis.
- (c) Not rejecting a true null hypothesis.
- (d) Not rejecting a false null hypothesis

33. Which of the following statements is not true?

- (a) The probability of making a Type II error increases as the probability of making a Type I error.
- (b) The probability of making a Type II error and the level of significance are the same.
- (c) The power of the test decreases as the level of significance decreases.
- (d) All of these choices are true.

34. In testing the hypotheses $H_0: \mu = 50$ vs. $H_1: \mu \neq 50$, the following information is known: $n = 64$, $x = 53.5$, and $\sigma = 10$. The standardized test statistic z equals:

- (a) 1.96
- (b) -2.80
- (c) 2.80
- (d) -1.96

35. Suppose that we reject a null hypothesis at the 0.05 level of significance. Then for which of the following α values do we also reject the null hypothesis?

- (a) 0.06
- (b) 0.04
- (c) 0.03
- (d) 0.02

36. In testing the hypotheses $H_0: \mu = 75$ vs. $H_1: \mu < 75$, if the value of the test statistic z equals -2.42 , then the p-value is:

- (a) 0.5078
- (b) 2.4200
- (c) 0.9922
- (d) 0.0078

If a hypothesis is rejected at the 0.025 level of significance, It:

- (a) Must be rejected at any level.
- (b) Must be rejected at the 0.01 level.
- (c) Must not be rejected at the 0.01 level.
- (d) May or may not be rejected at the 0.01 level.

37. Suppose that we reject a null hypothesis at the 0.05 level of significance. Then for which of the following α values do we also reject the null hypothesis?

38. Suppose that we reject a null hypothesis if the level of significance equals 0.05?

- (a) 0.150
- (b) 0.100
- (c) 0.051
- (d) 0.025

39. Suppose that we reject a null hypothesis at the 0.05 level of significance, It:

40. Suppose that in a certain hypothesis test the null hypothesis is rejected at the .10 level; it is also rejected at the .05 level; however it cannot be rejected at the .01 level.

The most accurate statement that can be made about the p-value for this test is that:

- (a) p-value = 0.01.
- (b) p-value = 0.10.
- (c) $0.01 < \text{p-value} < 0.05$.
- (d) $0.05 < \text{p-value} < 0.10$.

ANSWERS

1. (c)	2. (b)	3. (a)	4. (c)	5. (b)	6. (a)	7. (c)	8. (d)
9. (a)	10.(b)	11.(c)	12.(c)	13.(c)	14.(a)	15.(b)	16.(b)
17.(c)	18.(c)	19.(a)	20.(b)	21.(a)	22.(c)	23.(b)	24.(a)
25.(b)	26.(c)	27.(a)	28.(b)	29.(b)	30.(d)	31.(a)	32.(d)
33.(b)	34.(c)	35.(c)	36.(d)	37.(d)	38.(d)	39.(a)	40.(c)

Q. What is Hypothesis testing?

Ans. A process by which an analyst tests a statistical hypothesis. The methodology employed by the analyst depends on the nature of the data used, and the goals of the analysis. The goal is to either accept or reject the null hypothesis.

Q. Explain the Logic of Hypothesis Testing

Ans. Put simply, the logic underlying the statistical hypothesis testing procedure is:

1. State the Hypothesis: We state a hypothesis (guess) about a population. Usually the hypothesis concerns the value of a population parameter.
2. Define the Decision Method: We define a method to make a decision about the hypothesis. The method involves sample data.

3. Gather Data: We obtain a random sample from the population.

4. Make a Decision: We compare the sample data with the hypothesis about the population. Usually we compare the value of a statistic computed from the sample data with the hypothesized value of the population parameter.

- If the data are consistent with the hypothesis we conclude that the hypothesis is reasonable.

Question & Answers

Chapter 13

SIMPLE LINEAR REGRESSION AND CORRELATION

SELECT APPROPRIATE ANSWER

1. Least square regression line always passes through _____
 - (a) (x, y)
 - (b) (X, Y)
 - (c) (X, Z)
 - (d) $\frac{x}{y}$
2. The two regression co-efficients always have the _____ sign.
 - (a) Different
 - (b) Same
 - (c) None of these
 - (d) +ve
3. γ_{xy} is always equal to _____
 - (a) γ_{yx}
 - (b) γ_{yyx}
 - (c) γ_{yx}
 - (d) γ_0^2
4. The regression co-efficients are _____ origin.
 - (a) Dependent
 - (b) Independent
 - (c) Scale
 - (d) Both

5. A model is linear if it is linear in the variable and also in _____

- (a) Parameter
- (b) Independent variable
- (c) Error term

6. When the two regression lines coincide there is _____.

- (a) Zero
- (b) Less than zero
- (c) More than zero
- (d) Great

7. In $x = 2 \text{ } \dots$ by the value of y are increasing by one unit then values of x are.

- (a) Increasing by .6
- (b) Decreasing by .6
- (c) No change

8. If $y = 2 + .6x$ then value of y intercept is _____

- (a) .6
- (b) 2
- (c) 0
- (d) None

9. If $x = 3$ then value of regression co-efficient of X or Y is _____

- (a) (3)
- (b) (0)
- (c) -3
- (d) -4

10. Regression co-efficient is denoted by _____

- (a) by
- (b) byx
- (c) bzx
- (d) m

11. In correlation, both variables are _____

- (a) Random
- (b) Fixed
- (c) Non-random
- (d) Experimental

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Correlation is _____ of regression coefficients.

- (a) A.M.
- (b) G.M.
- (c) M.D.
- (d) H.M.

14. Correlation coefficient lies between _____ with respect to x and y .

- (a) $0 \leq r \leq 1$
- (b) $0 \leq r \leq -1$
- (c) $-1 \leq r \leq 1$
- (d) $1 \leq r \leq 0$

15. Correlation coefficient is _____ of origin and unit of measurement.

- (a) Origin
- (b) Dependence
- (c) Independence
- (d) None

16. Which of the following can never be taken as coefficient of correlation is _____

- (a) -.99
- (b) .99
- (c) 0
- (d) $\sqrt{3}$

17. If $b_{xy} = .8$ by $x = 1.2$ then value of r is _____

- (a) $\sqrt{.96}$
- (b) $\sqrt{- .96}$
- (c) 0
- (d) None of these

18. If x and y are independent to each other the coefficient of correlation is _____

- (a) -1
- (b) +1
- (c) .6
- (d) 0

19. If $b_{xy} = b_{yx} = r$ then _____
 (a) $6x < 6y$
 (b) $6y < 6x$
 (c) $6x = 6y$
20. If r , between $u = x$ and $y = -x$ is _____
 (a) +1
 (b) -1
 (c) 0
21. Two attributes are associated if expected frequency is _____
 (a) Less than observed
 (b) Greater than observed
 (c) Equal to observed
 (d) None of these
22. In $r \times c$ table for test of Independence the degree of freedom is _____
 (a) $r + c$
 (b) rc
 (c) $|r - c|$
 (d) $(r - 1)(c - 1)$
23. $(A \beta C)$ is a frequency of attributes of order _____
 (a) 3
 (b) 2
 (c) 1
24. If $(AB) > \frac{(A)(B)}{n}$ _____ then A and B are
 (a) Independent
 (b) Associated
 (c) Dis-associated
 (d) None of these
25. In perfect association the value of coefficient of association is _____
 (a) 0
 (b) +1
 (c) -1

26. The table representing two attributes is called _____
 (a) Random table
 (b) Contingency table
 (c) Dichotomy table
 (d) Chi-square table
27. Attributes are _____ if they have some relation.
 (a) Disassociation
 (b) Inconsistent
 (c) Associated
 (d) None of these

28. To cut a population into three classes is called _____
 (a) Dichotomy
 (b) Capital
 (c) Tracheotomy
 (d) Attribute

29. Richness is not a _____
 (a) Constant
 (b) Discrete
 (c) Variable
 (d) Continuous

30. Drugs are the example of _____
 (a) Association
 (b) Attribute
 (c) Consistent
 (d) Randomly

ANSWERS

1.(b)	2.(b)	3.(a)	4.(b)	5.(a)	6.(a)	7.(b)	8.(a)
9.(b)	10.(b)	11.(a)	12.(b)	13.(c)	14.(c)	15.(c)	16.(d)
17.(d)	18.(d)	19.(c)	20.(b)	21.(a)	22.(d)	23.(a)	24.(b)
25.(b)	26.(b)	27.(c)	28.(c)	29.(c)	30.(b)		

Chapter 14

ASSOCIATION

SELECT APPROPRIATE ANSWER

1. A characteristic which cannot be measured numerically is called: _____
 (a) Attribute (b) Qualitative variable
 (c) Categorical variable (d) All of the above
2. Which of the following is not the example of attribute? _____
 (a) Religion of people of a country
 (b) Eye color of students in a class
 (c) Weight of children
 (d) Smoking habits of teen-agers
3. The relationship between two attributes is called: _____
 (a) Regression (b) Correlation
 (c) Association (d) Coefficient of association
4. Positive attributes denoted by capital letters A, B, ... Represent: _____
 (a) The presence of attributes
 (b) The absence of attributes

5. The number of ultimate class frequencies for k attributes is given by _____
 (a) 3^4 (b) k^3
 (c) k^2 (d) 2^k

6. If two attributes A and B are associated, then _____
 (a) $(AB) = \frac{n}{(A)(B)}$ (b) $(AB) = \frac{(A)(B)}{n}$
 (c) $(AB) \neq \frac{(A)(B)}{n}$ (d) None of these

7. The two attributes A and B are positively associated or simply associated if _____
 (a) $(AB) > \frac{(A)(B)}{n}$ (b) $(AB) = \frac{(A)(B)}{n}$
 (c) $(AB) < \frac{(A)(B)}{n}$ (d) None of these

8. The two attributes A and B are negatively associated or simply disassociated if _____
 (a) $(AB) > \frac{(A)(B)}{n}$ (b) $(AB) = \frac{(A)(B)}{n}$
 (c) $(AB) < \frac{(A)(B)}{n}$ (d) None of these

9. The strength of association between two attributes A and B is known as _____
 (a) Coefficient of association
 (b) Coefficient of disassociation
 (c) Random frequency

(d) Class frequency

10. The number of observations falling in a particular cell is called the _____

(a) Classification (b) Rank correlation
(c) Cell frequency (d) None of these

11. The numerical measure of association between two attributes is called: _____

(a) Positive association
(b) Negative association
(c) Coefficient of association
(d) None of these

12. If Yule's coefficient of association (Q) is zero, then the two attributes are: _____

(a) Independent (b) Not independent
(c) Positively associated (d) Negatively associated

13. An $r \times c$ contingency table has degrees of freedom: _____

(a) $r \times c$ (b) $r \cdot c$
(c) $r \times c - 1$ (d) $(r - 1)(c - 1)$

14. The test-statistics used for tests of independence is _____

(a) $\Sigma \left[\frac{f_e - f_o}{f_e} \right]^2$ (b) $\Sigma \left[\frac{f_o - f_e}{f_e} \right]^2$
(c) $\Sigma \left[\frac{f_e - f_o}{f_e} \right]^2$ (d) $\Sigma \left[\frac{f_o - f_e}{f_e} \right]^2$

ANSWERS

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

15. The value of x^2 can never be: _____

(a) Zero (b) Greater than 1
(c) Negative (d) Positive

Chapter 15

ANALYSIS OF TIME SERIES

SELECT APPROPRIATE ANSWER

1. A time series is a _____ of time.
 (a) Period (b) Second
 (c) Relation (d) Part
 2. The Sequence following random or irregular patterns of variation is called _____.
 (a) Cyclical trend (b) Irregular variation
 (c) Scooter (d) None of these
 3. Time series has components _____.
 (a) 6 (b) 3
 (c) 4 (d) 2
 4. The sequence of some regular patterns variation can be completed is called _____.
 (a) Seasonal (b) Systematic
 (c) Irregular (d) None of these
 5. A variation in a short term is called _____.
 (a) Cyclical (b) Random
- In a St. Line equation $y = a + bx$ a is the _____
- (a) x - intercept (b) slope
 (c) Y intercept (d) None of these
- Which of the following variation is not regular nature _____
- (a) Secular trend (b) Irregular variation
 (c) Seasonal (d) Cyclical
- If a St. line is fitted to the time series then _____
- (a) $\Sigma y = \Sigma Y$ (b) $\Sigma y < \Sigma Y$
 (c) $\Sigma(y - y) = 0$ (d) a and c but not b
- Semi average method is used for measurement of trend when _____
- (a) Trend is curvilinear (b) Trend is linear
 (c) Trend is smooth (d) None of these
- There are used _____ measurement of secular Trend.
- (a) 6 (b) 7
 (c) 8 (d) 5
- The describing measuring and isolating various components are called _____
- (a) Time series (b) Variation
 (c) Analysis (d) Random movement

Increase in stationery item in the month of April in Pakistan is called _____

- (a) Secular trend (b) Seasonal variation
 (c) Cyclical variation (d) Irregular

240

13. Total of time series represented by mathematically is _____

- (a) $y = T \times C \times L$
- (b) $y = P \times c \times I$
- (c) $X = 4I + P + q$
- (d) $y = T \times C \times S \times I$

14. _____ Method is applied only when trend is linear.

- (a) Method of moving scatter
- (b) Linear
- (c) Semi-average
- (d) None of these

15. Indicate which is following is an example of secular trend _____

- (a) The production of wheat 1980-97
- (b) Sudden causes by war
- (c) Birth by hours of day
- (d) None of these

16. Which of the following is not a component of time series _____?

- (a) A non-random component
- (b) A long term smooth
- (c) A cyclical component
- (d) A seasonal component

17. The C in $Y = a + bx + cx^2$ measure the point of _____

- (a) r tight - line
- (b) Curve
- (c) Concave
- (d) Long-line

18. In theory of time series, shortage of certain consumer goods before annual budget is due to: _____

- (a) Secular trend
- (b) Seasonal variations
- (c) Cyclical variations
- (d) Irregular movements

241

If a least squares line is fitted to the time series, then: _____

- (a) $\Sigma(y - \hat{y}) = 0$
- (b) $\Sigma y < \Sigma \hat{y}$
- (c) $\Sigma(y - \hat{y})^2 = 0$
- (d) None of these

20. Which of the following is an example of irregular movement's _____

- (a) The production of wheat from 1995-2000
- (b) Birth by hours of time
- (c) Sudden causes by war
- (d) The sales of coolers

21. The graph of time series is called _____

- (a) Historygram
- (b) Straight line graph
- (c) Histogram
- (d) None of these

22. Increase in the number of patients in the hospital due to sun stroke _____

- (a) Secular trend
- (b) Seasonal variation
- (c) Cyclical variation
- (d) Irregular variation

23. Decline in savings due to high price level is: _____

- (a) Trend
- (b) Seasonal
- (c) Cyclical
- (d) Irregular

24. An era of property is _____

- (a) Trend
- (b) Seasonal
- (c) Cyclical
- (d) Irregular

- Pakistan _____
- (a) Secular trend (b) Seasonal variation
 (c) Cyclical variation (d) Irregular variation
26. Increase in general level of prices in Pakistan _____
- (a) Cyclical variation (b) Seasonal variation
 (c) Secular trend (d) Irregular variation
27. Increased pollution due to increased industry and automobiles is _____
- (a) Secular Trend (b) Seasonal variation
 (c) Cyclical variation (d) Irregular variation
28. Increased demand of L.P.G. instead of firewood and kerosene oil is _____
- (a) Secular Trend (b) Seasonal variation
 (c) Cyclical variation (d) Irregular variation
29. We can eliminate seasonal, cyclical and irregular variations using: _____
- (a) Free hand curve method
 (b) Method of semi averages
 (c) Method of moving averages
 (d) None of these
30. Some values at the beginning and at the end of time series are lost in _____
- (a) Method of semi averages
 (b) Method of moving averages
31. According to the method of least squares, the best fitted line/curve is one for which the sum of squares is: _____
- (a) Zero (b) Negative
 (c) Maximum (d) None of these
32. We have to find centered moving averages, if the time period is: _____
- (a) In even number (b) More than 10
 (c) In odd number (d) None of these
33. Secular trend covers a period of not less than: _____
- (a) One year (b) Two years
 (c) Five years (d) Ten years
34. Trend values in free hand curve method are obtained by: _____
- (a) Equation (b) graph
 (c) Both (a) and (b) (d) None of these
35. The minimum duration of a season is: _____
- (a) One year (b) Six months
 (c) One quarter (d) One second
36. Which of the following is not a component of time series?
 (a) trend
 (b) seasonal variations

- (c) Cycle
(e) Smoothing
(d) irregular fluctuations

37. Which of the following time-series forecasting methods would not be used to forecast seasonal data?
 (a) Dummy variable regression.
 (b) Simple exponential smoothing.
 (c) Time-series decomposition.
 (d) All of the above can be used to forecast seasonal data.

38. The smoothing constant is a number that determines how much weight is attached to each observation
 (a) True
 (b) False

39. Simple exponential smoothing is an appropriate method for prediction purposes when there is a significant trend present in a time series.
 (a) True
 (b) False

40. When depersonalizing a time series observation, the actual time series observation is divided by its seasonal factor.
 (a) True
 (b) False

Question & Answers

Q. Define time series

Ans. A time series is a collection of observations of well-defined data items obtained through repeated measurements over time. For example, measuring the value of retail sales each month of the year would comprise a time series. This is because sales revenue is well defined, and consistently measured at equally spaced intervals. Data collected irregularly or only once are not time series.

An observed time series can be decomposed into three components: the trend (long term direction), the seasonal (systematic, calendar related movements) and the irregular (unsystematic, short term fluctuations).

ANSWERS

1.(a)	2. (b)	3. (c)	4. (b)	5. (c)	6. (b)	7. (c)	8. (b)
9. (d)	10.(b)	11.(d)	12.(c)	13.(d)	14.(d)	15.(a)	16.(b)
17.(c)	18.(b)	19.(a)	20.(b)	21.(d)	22.(a)	23.(a)	24.(c)
25.(b)	26.(c)	27.(a)	28.(a)	29.(c)	30.(b)	31.(d)	32.(d)
33.(d)	34.(b)	35.(d)	36.(e)	37.(b)	38.(a)	39.(a)	40.(a)

Chapter 16

ORIENTATION OF COMPUTER

SELECT APPROPRIATE ANSWER

1. The unit that coordinates different devices of the computer system is called _____
 - (a) ALU
 - (b) Register
 - (c) Control unit
 - (d) Logical instructions

2. A computer bus consists of _____
 - (a) Register
 - (b) Parallel data paths
 - (c) ALU and CU
 - (d) Computer clock

3. The primary storage unit is also called: _____
 - (a) Storage registers
 - (b) Disk memory
 - (c) Accumulator
 - (d) Main memory

4. CPU is an example of: _____
 - (a) Software
 - (b) Program
 - (c) Hardware
 - (d) Output unit

5. A set of instructions given to the computer to solve a problem is called: _____
 - (a) Hardware
 - (b) System software
 - (c) Application software
 - (d) None of these