

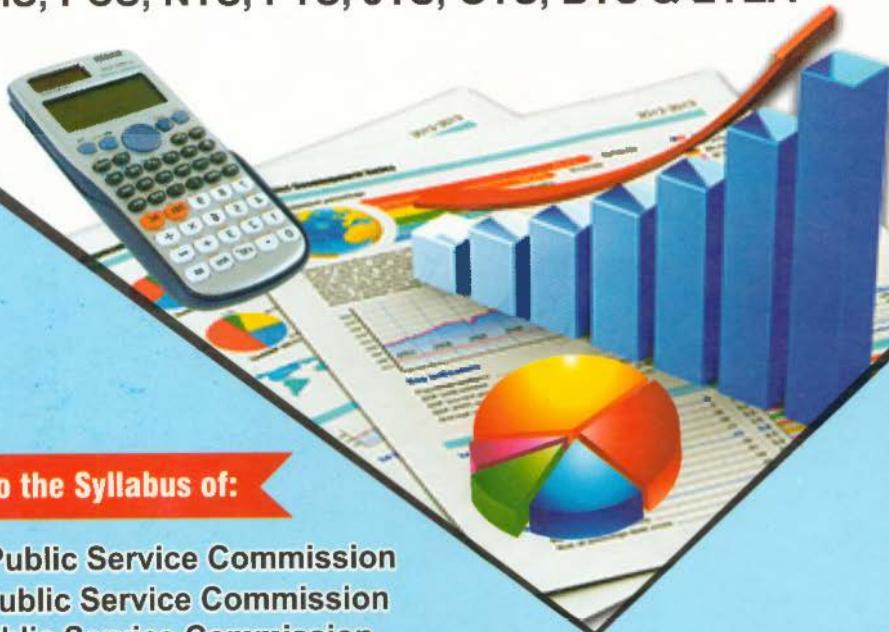


MCQs / Q & A

Statistics

For:

Lecturer, Statistical Officer / Assistant , Statistician (Chief)
Subject Specialist, Data Analyst / Scientist , Educator
GAT (Subject), Assistant Director, Population Census Officer
CSS, PMS, PCS, NTS, PTS, JTS, OTS, BTS & ETEA



According to the Syllabus of:

- Federal Public Service Commission
- Punjab Public Service Commission
- Sindh Public Service Commission
- AJ&K Public Service Commission
- Khyber Pakhtoonkhwa Public Service Commission
- Balochistan Public Service Commission
- Gilgit Baltistan Public Service Commission
- NTS, GAT(Subject), PTS, BTS, OTS & ETEA

M. Sohail Bhatti *By:* Prof. Muhammad Arshad

Public Service Commission & NTS MCQ's Series

Manual for Written Tests / Interviews

MCQs/Q&A

STATISTICS

for

**Lecturer, Subject Specialist, Educator, Statistical Officers, NAT, NTS,
ETEA, GAT (Subject), Census Officer, BS, M.Sc.**

According to the New Syllabus of:

- i) KPK Public Service Commission
- ii) Punjab Public Service Commission
- iii) Sindh Public Service Commission
- iv) Balochistan Public Service Commission
- v) Federal Public Service Commission
- vi) AJ&K Public Service Commission
- vii) Gilgit Baltistan Public Service Commission
- viii) NTS ♦ ETEA ♦ BTS ♦ PTS ♦ OTS

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MCQs on Miscellaneous Important Topics

Basics of Statistics

1. A 65 year old man is rushed to the emergency department by ambulance during an episode of chest pain. The preliminary assessment of the condition of the man is performed by a nurse, who reports that the patients' pain seems to be 'severe'. The characterization of pain as 'severe' is:
 - (a) Dichotomous
 - (b) Nominal
 - (c) ✓ Ordinal
 - (d) Qualitative
2. Data concerning events over a period of time is:
 - (a) ✓ Time series data
 - (b) Moving data
 - (c) Random data
 - (d) Secondary data
3. Select the following statement which you believe to be true. An ordinal variable is one for which:
 - (a) The data are discrete and can take one of any values
 - (b) The data are continuous and follow an ordered sequence
 - (c) The data are categorical
 - (d) ✓ The categories of response are ordered
4. Select the following variable which is measured on a nominal scale:
 - (a) Height in cm
 - (b) ✓ Ethnic group
 - (c) Age categorized as young, middle-aged or old
 - (d) Age in years
5. Select the following statement which you believe to be true:
 - (a) A nominal variable has categories that can be ordered in some way
 - (b) ✓ Quantitative data occur when the variable takes some numerical value

- (c) An ordinal variable relates to a particular type of numerical data
- (d) A binary categorical variable can be either nominal or ordinal
6. Select the following variable that is example of categorical variable:
 - (a) Number of episodes of disease in a patient over a year
 - (b) Serum bilirubin level
 - (c) Weight
 - (d) ✓ Severity of haemophilia (mild/moderate/severe)
7. Select the following variable that is example of discrete variable:
 - (a) ✓ Number of episodes of disease in a patient over a year
 - (b) Serum bilirubin level
 - (c) Severity of haemophilia (mild/moderate/severe)
 - (d) Reduction in blood pressure following antihypertensive treatment
8. Phase of statistics which deals with procedures for valid conclusion is called:
 - (a) ✓ Inferential statistics
 - (b) Descriptive statistics
 - (c) Sampling
 - (d) Explanatory statistics
9. Results of a test are given as, very satisfied, satisfied, dissatisfied, it represents:
 - (a) Nominal scale
 - (b) ✓ Ordinal scale
 - (c) Ratio scale
 - (d) Interval scale
10. All are examples of nominal scale, except:
 - (a) ✓ Blood pressure
 - (b) Color
 - (c) Sex
 - (d) Race
11. A physician, after examining a group of patients, classified the condition as normal, mild, moderate, severe, which one the following scale is being

- adopted:
- Nominal scale
 - ✓ Ordinal scale
 - Ratio scale
 - Interval scale
12. Measurements usually provide:
- Discrete data
 - ✓ Continuous data
 - Categorical data
 - Qualitative data
13. Number of deaths in Mayo Hospital last year is an example of:
- Qualitative data
 - Continuous data
 - Categorical data
 - Discrete data
14. Issuing a national ID card is an example of:
- ✓ Primary data
 - Registration
 - Census
 - Sampling
15. Life of people in a group is an example of:
- ✓ Continuous variable
 - Discrete variable
 - Qualitative variable
 - Categorical variable
16. Phase of statistics that is concerned with description of data is called:
- Inferential statistics
 - ✓ Descriptive statistics
 - Sampling
 - Explanatory statistics
17. Branch of statistics by which conclusions are drawn for population on the basis of sample observations is called is:
- ✓ Inferential statistics
 - Descriptive statistics
 - Resultant variable
 - Natural statistics
18. When variables are not measurable. Which of the following is used to be represented?
- ✓ Nominal
 - Continuous
 - Interval
 - Ratio
19. Which of the following is a discrete variate?
- Skin colour
 - Blood pressure
 - Weight
 - ✓ Boys in the class
20. Laws of statistics are only applicable:
- In the short run
 - ✓ On the average or in the long run
 - In every case
 - None of these
21. Statistical uncertainty arises due to:
- Lack of knowledge
 - ✓ Various types of variations
 - Partial compliance
 - None of these
22. Statistics is the word of:
- English
 - French
 - ✓ Latin
 - None of these
23. Weights of babies born in a hospital is an example:
- Discrete variable
 - Random variable
 - Attribute
 - ✓ Continuous variable
24. Which one of the following is NOT a source of existing data?
- Medical record in hospital
 - ✓ Survey of household
 - World health report
 - Health information in health department
25. Record in OPD is an example of:
- ✓ Raw data
 - Secondary data
 - Condensed data
 - Grouped data
26. A researcher collects data to find the prevalence of diabetes in Lahore, he is using:
- Inferential statistics
 - ✓ Descriptive statistics
 - Test of significance
 - Sampling
27. In singular sense statistics is defined by:

- (a) Methods (b) Numerically
 (c) ✓ Collectively (d) Observations
28. Totality of subjects under discussion for which result will be generalized is called as:
 (a) Sample (b) Portion
 (c) ✓ Population (d) Mean
29. The part of whole is called:
 (a) ✓ Sample (b) Population
 (c) Mean (d) Aggregation
30. Numerical quantities like mean, median calculated from population are called:
 (a) Statistic (b) Statistics
 (c) ✓ Parameter (d) Estimator
31. Numerical quantities calculated from sample observation is called:
 (a) ✓ Statistic (b) Parameter
 (c) Constant
 (d) None of above
32. Quantity which does not vary from individual to individual is called:
 (a) Variable (b) ✓ Constant
 (c) Discrete variable
 (d) Continuous variable
33. Height of patients is example of:
 (a) Constant (b) ✓ Variable
 (c) Proportion (d) Parameter
34. If 'C' is any constant value then $\sum_{i=1}^n C =$
 (a) C^n (b) ✓ nC
 (c) $2C$ (d) $5C$
35. $x_2 + x_3 + x_4 + x_5$ can be summarized as:
 (a) $\sum_{i=1}^5 x_i$
 (b) $\sum_{i=2}^5 y_i$
 (c) ✓ $\sum_{i=2}^5$ (d) \bar{x}
36. $x_1, x_2, x_3, \dots, x_n$ can be written as:

- (a) ✓ $\sum_{i=1}^5 x_i$ (b) $\pi_{i=1}^n x_i$
 (c) $n \times n$ (d) $\sum_{i=1}^n f x_i$
37. $(x_2 - b)^2 + (x_3 - b)^2 + (x_4 - b)^2 + \dots + (x_{20} - b)^2$ can be summarized as:
 (a) ✓ $\sum_{i=2}^{20} (x_i - b)^2$
 (b) $\sum_{i=1}^{20} (x_i - b)^2$
 (c) $\sum_{i=2}^n (x_i - b)^2$
 (d) $\sum_{i=1}^n (x_i^2 - b)$
38. $1 + 2 + 3 + \dots + n =$
 (a) $\frac{n}{2}$ (b) ✓ $\frac{n(n+1)}{2}$
 (c) $\frac{n^2}{2}$ (d) $\frac{n+1}{2}$
39. Data which is classified by their time of occurrence is called as:
 (a) Discrete data
 (b) ✓ Chronological
 (c) Geographical
 (d) Continuous data
40. Prevalence is a:
 (a) Ratio (b) Rate
 (c) Proportion
 (d) ✓ Mode of disease
41. The mathematical science of making decisions and drawing results from data in situation of uncertainty is known as:
 (a) Physics (b) Math
 (c) Chemistry (d) ✓ Statistics
42. Is the notation for?
 (a) Average (b) Constant
 (c) ✓ Sum (d) Variable
43. A variable which can assume numerical values or measurable values
 (a) Qualitative variable
 (b) Statistical variable
 (c) ✓ Quantitative variable
 (d) Attributes

44. Continuous variable is the type of:
 (a) Qualitative variable
 (b) Random experiment
 (c)✓ Quantitative variable
 (d) None of these
45. A variable which can not assume numerical measurements is called as:
 (a) Descriptive variable
 (b)✓ Qualitative variable
 (c) Variation (d) C.V.
46. Branch of statistics by which obtained data is organized and summarized in order to describe its nature is called as:
 (a) Explanatory statistics
 (b)✓ Descriptive statistics
 (c) Inferential statistics
 (d) None of these

Sampling Techniques

1. The complete list of population is called:
 (a)✓ Sampling frame
 (b) Parameter
 (c) Statistic (d) Sampling unit
2. For taking sample from internet websites the most suitable method of sampling is:
 (a) Simple random sampling
 (b) Cluster sampling
 (c) Snow-ball sampling
 (d)✓ Double sampling
3. Mean of sampling distribution of sample means can be written as:
 (a) \bar{x} (b) μ
 (c)✓ $\mu_{\bar{x}}$ (d) μ_x
4. Standard error is a measure of:
 (a) Conceptual error (b)✓ Sampling error
 (c) Instrumental error
 (d) Observer error
5. $\sqrt{\frac{pq}{n}}$ indicates:
 (a) Standard error of mean
 (b) Difference between proportions

- (c)✓ Standard error of proportion
 (d) Difference of two probabilities
6. The example of non-probability sampling is:
 (a) Simple random sampling
 (b) Systematic sampling
 (c) Cluster sampling
 (d)✓ Quota sampling
7. The advantage of probability sampling is:
 (a) Convenient
 (b) Economical
 (c) Less skillful
 (d) Results are unreliable
 (e)✓ Minimizes bias
8. Best determinant of sample size is:
 (a)✓ Variability in population
 (b) Amount of accuracy desired
 (c) Resources available
 (d) Type of study design
9. Sampling technique which depends upon the basis of physical boundaries is:
 (a) Simple random
 (b)✓ Cluster sampling
 (c) Stratified sampling
 (d) Quota sampling
10. Sample size calculation does not depend upon:
 (a)✓ Type of study
 (b) Type of statistical analysis
 (c) Prevalence of condition
 (d) Incidence of condition
11. To reduce the sampling error, following strategy should be used:
 (a) Cross sectional study should be carried
 (b) Elimination of α & β - errors
 (c)✓ Increase sample size
 (d) Chi-square test should be used
12. Census is:
 (a) Sampling survey
 (b) Sampling
 (c)✓ Complete enumeration
 (d) All of the above
13. Where sampling size is determined in

- completing the study, the technique is called:
- Simple random sampling
 - Systematic
 - ✓ Sequential
 - Consecutive
14. A complete list of sampling units is:
- Sampling frame
 - Sampling design
 - Sampling limitations
 - Probability sampling
15. Instrumental error is an example of:
- Sampling error
 - ✓ None-sampling error
 - Standard error
 - Bias
16. Which is NOT a restricted sampling technique?
- Cluster sampling
 - Systematic sampling
 - Simple random sampling
 - Cluster sampling
17. Numerical quantity for sample data is:
- μ
 - \bar{x}
 - ✓ Statistic
 - Mean
18. Numerical quantity for population is:
- Statistic
 - ✓ Parameter
 - σ_x
 - μ_x
19. Difference between statistic and parameter is:
- Selection error
 - ✓ Sampling error
 - Non sampling error
 - Bias
20. When a large population is divided into subpopulations of homogenous characters called strata and a sample is selected at random from each stratum, the sampling is:
- Simple random sampling
 - Cluster sampling
 - ✓ Stratified random sampling
 - Quota sampling
21. Lottery method is the example of:
- Non-probability sampling
 - ✓ Simple random sampling
 - Cluster sampling
22. All are true about cluster sampling except:
- ✓ Sample size is same as simple random sampling
 - Results can be generalized for population
 - Clusters are naturally occurring groups
 - Less efficient than simple random sampling
23. True about simple random sampling:
- ✓ Every person has equal chance of selection
 - Less number of samples is obtained
 - Also known as systematic sampling
 - Less efficient than any other sampling method
24. For a survey a village is divided into 5 lanes, then each lane is sampled randomly, this is example of:
- Simple random sampling
 - Systematic random sampling
 - ✓ Stratified random sampling
 - All of above
25. In a community of 3000 people, 80% Muslims, 10% Christian, 5% Hindu, 4% Sikh, 1 % other, to select a sample of 300 people to investigate the food habits, ideal sampling method is:
- Simple random sampling
 - Systematic random sampling
 - ✓ Stratified random sampling
 - All of above
26. One family unit is chosen at random and then every 5th family is chosen the sampling method is used:
- Simple random sampling
 - ✓ Systematic random sampling
 - Stratified random sampling
 - All of above
27. $S^2 = \frac{\sum(x - \bar{x})^2}{n}$ is:
- An unbiased sample variance

- (b)✓ A biased sample variance
 (c) Variance of means
 (d) Squared variation
28. $S^2 = \frac{\sum(x - \bar{x})^2}{n-1}$ is:
 (a) A biased sample variance
 (b) Standard deviation of sample
 (c)✓ Unbiased sample variance
 (d) Combined variance
29. $\sigma^2_{\bar{x}}$ is equal to
 (a) σ^2 (b)✓ $\frac{\sigma^2}{n}$
 (c) $\frac{\sigma}{\sqrt{n}}$ (d) $\sqrt{\frac{\sigma^2}{n}}$
30. A sampling method that can be used with either simple random sampling or systemic sampling to ensure adequate representation of certain groups in the sample is called:
 (a)✓ Stratified sampling
 (b) Matching
 (c) Convenience sampling
 (d) Gaussian sampling
31. Systematic component of error is known as:
 (a) Sampling error
 (b) Non-sampling error
 (c)✓ Bias (d) Type-I error
32. A small representative part of population is:
 (a) Population (b) Sample
 (c) Aggregate (d) Parameter
33. A survey is to be carried out in the central area of a town and the residential outskirts of it. The shopping habits and expenditure of people living there are to be studied. The best sampling method would be:
 (a) A stratified random sample of individuals
 (b)✓ A stratified random sample of households
 (c) A simple random sample of individuals
- (d) A simple random sample of households
34. A guard standing at entrance of Mayo Hospital that stops every vehicle is using:
 (a) Simple random sampling
 (b) Systematic sampling
 (c)✓ Complete enumeration
 (d) Stratified random sampling
35. Which sampling method requires full sampling frame of all the subjects:
 (a)✓ Simple random sampling
 (b) Stratified random sampling
 (c) Cluster random sampling
 (d) Multistage sampling
36. For coverage of rare disease the most suitable method of sampling is:
 (a) Simple random sampling
 (b) Systematic sampling
 (c)✓ Snow-ball sampling
 (d) Double sampling
37. Sampling error can be reduced by:
 (a)✓ Increasing sample size
 (b) Decreasing sample size
 (c) Fixing the size
 (d) None of these
38. Simple random sampling is used:
 (a)✓ At some stage in any type of probability sampling
 (b) Only in systematic sampling
 (c) Where a researcher can select any person accidentally
 (d) None of these
39. Which is true for cluster sampling?
 (a) Every K^{th} case is chosen for study
 (b) Involves the use of random number
 (c)✓ A natural group is taken as sampling unit
 (d) Stratification is done
40. Suppose out of 300 diabetic cases, 100 have $BMI < 25$ and 200 have $BMI > 25$ Kg/m^2 . Which is the suitable sampling technique to select 25 patients out of 100 with low BMI and 50

- out of 200 with high BMI?
- Simple random sampling
 - ✓ Stratified random sampling
 - Cluster random sampling
 - Multistage sampling
11. Whole of the values or items is:
- Sample
 - Statistic
 - ✓ Population
 - Parameter
12. Difference between the expected value of any statistic and the parameter is:
- ✓ Bias
 - Sampling error
 - Non-sampling error
 - Unbiasedness
13. The error which is introduced by faulty or wrong interviewing is:
- ✓ Non-sampling error
 - Standard error
 - Sampling error
 - Bias
14. Technique of sampling in which each sampling unit have not any specified probability of selection is called as:
- Simple random sampling
 - ✓ Non-probability sampling
 - Specified sampling
 - Probability sampling
15. The two main sampling designs are:
- Systematic and cluster sampling
 - Purposive and random sampling
 - Random sampling and stratified random sampling
 - ✓ Probability sampling and non-probability sampling
46. \bar{x} is a:
- Parameter
 - ✓ Statistic
 - Proportion
 - None of these

Data Management

Histogram shows:

- ✓ Trend of an event with passage of time
- Arithmetic mean
- Most commonly occurring value
- Difference between the highest

- and lowest value
2. Sex composition demonstrated in which of the followings:
- ✓ Pie chart
 - Component bar chart
 - Age pyramid
 - Multiple bar chart
3. Point representation of observed frequency is made in the:
- Line diagram
 - Pie chart
 - Bar chart
 - ✓ Polygon
4. Adjacent rectangles with class boundaries along x-axis and frequencies along y-axis make:
- Frequency curve
 - Frequency polygon
 - Historogram
 - ✓ Histogram
5. Difference between upper class boundary and lower class boundary of each group is:
- Mid point
 - Average
 - Class interval
 - Frequency
6. The best way of presentation of data which shows the relationship between two variables is:
- Histogram
 - ✓ Scatter diagram
 - Component bar chart
 - Pie diagram
7. $\frac{\text{Individual value}}{\text{Total value}} \times 360^\circ$ is:
- Section
 - Component
 - ✓ Sector angle
 - Bar
8. In constructing ogive, what should be along x-axis in the following?
- ✓ Upper class boundaries
 - Mid points
 - Upper class limits
 - Frequencies
9. Relative frequency can be obtained by:

- (a) $\frac{x}{\sum f}$ (b) $\frac{c.f}{\sum f}$
 (c) $\checkmark \frac{f}{\sum f}$ (d) $\frac{c.b}{\sum f}$
10. Graph of a symmetrical distribution is:
 (a) U-shaped (b) \checkmark Bell shaped
 (c) J-shaped (d) Bar shaped
11. Data which have been arranged in ascending or descending order is called as:
 (a) Qualitative data
 (b) Group data
 (c) \checkmark Arrayed (d) Ungroup data
12. Approximate formula to find number of groups for an ungrouped data is:
 (a) $3.3 \log n$ (b) $\checkmark 1 + 3.3 \log n$
 (c) $3 + 3.3 \log n$
 (d) $10 + 3.3 \log n$
13. _____ are used when you want to visually examine the relationship between two quantitative variables:
 (a) Bar graphs (b) Pie graphs
 (c) Line graphs (d) \checkmark Scatter plots
14. A graph that uses vertical bars to represent data is called a _____
 (a) Line graph (b) \checkmark Bar graph
 (c) Scatter plot
 (d) Vertical graph
15. Select the following statement which you believe to be true. A histogram:
 (a) Can be used instead of a pie chart to display categorical data
 (b) Is similar to a bar chart but there are no gaps between the bars
 (c) \checkmark Contains contiguous bars with the height of each bar being proportional to the frequency of the observations in the range specified by the bar
 (d) Can be used to display either a frequency or a relative frequency distribution
16. Select the following statement which you believe to be true. A bar chart:
 (a) \checkmark Is used to display categorical
- data
 (b) Can also be called a histogram
 (c) Should be drawn without gaps between the bars
 (d) Can only be used to display data which have a symmetrical distribution
17. Select the following type(s) of figures that would be appropriate for illustrating the distribution of heights of children in a class:
 (a) Bar chart (b) Pie chart
 (c) Stem-and-leaf plot
 (d) \checkmark Histogram
18. Select the following type(s) of figures that would be appropriate for illustrating the relationship between gender and blood group in a sample of adults:
 (a) Bar chart (b) Pie chart
 (c) Stem-and-leaf plot
 (d) \checkmark Box-plot
19. Select the following type(s) of figures that would be appropriate for illustrating the number of fruit and vegetable portions consumed in a week by the 60 first year medical students in a medical school:
 (a) \checkmark Bar chart (b) Pie chart
 (c) Stem-and-leaf plot
 (d) Histogram
20. Data classified by region or location is called:
 (a) Qualitative data
 (b) Quantitative data
 (c) \checkmark Geographical data
 (d) Chronological data
21. Data classified by time of their occurrence is called:
 (a) Qualitative data
 (b) Quantitative data
 (c) Geographical data
 (d) \checkmark Chronological data
22. Descending order is called:
 (a) Grouped data
 (b) Qualitative data

- (c) Quantitative data
 (d) ✓ Arrayed data
23. No. of values or objects present in each class is:
 (a) ✓ Frequency
 (b) Frequency distribution
 (c) Midpoints (d) Class mark
24. The smallest and largest values of data are called as:
 (a) ✓ Range (b) Mid point
 (c) Extreme values
 (d) Arrayed values
25. Any characteristic which is divided into two classes is:
 (a) Trichotomy
 (b) Monochotomy
 (c) Multifold division
 (d) ✓ Dichotomy
26. Any characteristic which is divided into 3 classes is:
 (a) ✓ Trichotomy
 (b) Dichotomy
 (c) Monochotomy
 (d) Multichotomy
27. $\frac{\text{Lower limit} + \text{Upper limit}}{2}$ is:
 (a) Mid year (b) \bar{X}
 (c) Centre (d) ✓ Mid point
28. Class interval for 4 - 7, 8 - 11, 12 - 15 is:
 (a) 2 (b) 3
 (c) ✓ 4 (d) None of these
29. Low Birth Weight (LBW) data of a Hospital is best shown by:
 (a) Simple bar chart
 (b) ✓ Histogram
 (c) Pie chart
 (d) Frequency polygon
30. For construction of histogram we need:
 (a) Class limits with corresponding frequencies
 (b) ✓ Class boundaries with corresponding frequencies
 (c) Class limits with corresponding cumulative frequencies
- (d) Class boundaries with corresponding cumulative frequencies
31. The graph of frequency distribution is best studied by:
 (a) Frequency polygon
 (b) Histogram
 (c) ✓ Histogram (d) Ogive
32. Percentage of data can be shown in:
 (a) ✓ Pie chart (b) Bar chart
 (c) Histogram
 (d) Frequency polygon
33. An ogive is also a:
 (a) Frequency polygon
 (b) Cumulative frequency
 (c) ✓ Cumulative frequency polygon
 (d) Histogram
34. The process of systematic arrangement of data into horizontal rows and vertical column is called as:
 (a) Pie chart (b) ✓ Tabulation
 (c) Identification
 (d) Index number
35. A non-symmetrical frequency distribution is known as:
 (a) Normal distribution
 (b) ✓ Skewed distribution
 (c) Cumulative frequency distribution
 (d) None of above
36. Line chart of the medical/health data shows:
 (a) ✓ Trend of events with passage of time
 (b) Most commonly occurring value of data
 (c) Histogram
 (d) Difference between highest value and lowest value
37. Enrolment of Patients in OPD of Mayo Hospital is best shown by:
 (a) Simple bar chart
 (b) Histogram
 (c) Pie chart
 (d) Frequency polygon
 (e) ✓ Histogram

38. Which is NOT an example of compressed data?
 (a) Frequency distribution
 (b) Histogram
 (c) ✓ Data array
 (d) Frequency polygon
39. Which of the following type of diagrams can be used to find out the relationship between two variables:
 (a) Pictogram (b) Bar diagram
 (c) Histogram
 (d) ✓ Scatter diagram
40. A pictorial diagram of frequency distribution is denoted:
 (a) Line chart. (b) Bar chart
 (c) ✓ Histogram (d) Pie chart
41. The arrangement of data according to some common characteristic is called:
 (a) Tabulation
 (b) Frequency distribution
 (c) ✓ Classification
 (d) Histogram
42. Mid point of a group which is ranging from 40 to 50 is:
 (a) ✓ 45 (b) 42.5
 (c) 45.5 (d) 47.5

Measure of Location

1. G.M. based on:
 (a) ✓ All values
 (b) Extreme value
 (c) Some values
 (d) Two values
2. Central most value of arrayed data is:
 (a) A.M. (b) ✓ Median
 (c) Mode (d) H.M.
3. If yellow coloured papers are arrayed according to intensity of colour for the following unarranged papers, then the medieval colour for Dark yellow, Light yellow, Bright yellow is:
 (a) Bright yellow
 (b) Dark yellow
 (c) ✓ Light yellow
 (d) All of above
- Sum of deviation from 20 for 10

- values is 40, the arithmetic mean is:
 (a) 40 (b) 20
 (c) ✓ 24 (d) 30
5. Sum of 100 values is 2000, the A.M. will be:
 (a) ✓ 20 (b) 20.4
 (c) 20.5 (d) 20.6
6. Mean of 1st 'n' natural numbers is:
 (a) $\frac{n}{2}$ (b) $\frac{n(n+1)}{2}$
 (c) ✓ $\frac{n+1}{2}$ (d) $\frac{n^2}{3}$
7. G.M. for -1, -2, 1, 2, 3 is:
 (a) ✓ Not possible
 (b) 1.5
 (c) 2.5 (d) 2.6
8. Which is mode defined in measure of location:
 (a) Arithmetic mean
 (b) Difference between highest and lowest value
 (c) Value of middle observation
 (d) ✓ The most frequent value
9. Which of the following describe the middle part of a group of numbers?
 (a) ✓ Measures of central tendency
 (b) Measures of variation
 (c) Measures of association
 (d) Measures of shape
10. Which of the following divides a group of data into ten subgroups?
 (a) Median (b) Quartiles
 (c) Percentiles
 (d) Arithmetic mean
 (e) ✓ Deciles
11. Simplest type of average is:
 (a) Weighted arithmetic mean
 (b) ✓ Arithmetic mean
 (c) Median
 (d) Geometric mean
12. Another name for the expected value of a random variable is:
 (a) Median (b) Mode
 (c) Mid-value (d) Variance
 (e) ✓ Arithmetic mean
13. If 70 values are arranged in ascending

- order, the middle value is:
- Arithmetic mean
 - Mode
 - 35th percentile
 - Median
14. Measures of variability shows scatter around the:
- Central tendency
 - Range
 - SD
 - Correlation coefficient
15. 30 babies were born in a hospital, 10 were less than 2.5 Kg and 20 were above 2.5 Kg, the average is:
- Median
 - Harmonic mean
 - Arithmetic mean
 - Geometric mean
16. Which of the following divides a group of data into four subgroups?
- Median
 - Quartiles
 - Percentiles
 - Arithmetic means
17. The mean of a distribution is 23, the median is 24, and the mode is 25.5. It is most likely that this distribution is:
- Negatively skewed
 - Positively skewed
 - Normal
 - Symmetrical
18. Thirty babies were born in a hospital, 15 was less than 2.5 Kg and 15 were greater than 2.5 Kg, which was the average to be calculated:
- Arithmetic mean
 - Median
 - Mode
 - Geometric mean
19. Median can be calculated when data is:
- Tabulated
 - Manipulated
 - Collected
 - Arrayed
20. Variables are arranged either in ascending or descending order of magnitudes to determine:
- Mean
 - Mode
 - Median
 - Range
21. What is the mode in statistics?
- Arithmetic average
 - Difference between the highest and lowest value
 - Value of middle observation
 - Most commonly occurring value
22. Median is almost equivalent to:
- 25th percentile
 - 50th percentile
 - 75th percentile
 - 10th percentile
23. Most frequently occurring observation in a data is known as:
- Mean
 - Median
 - Mode
 - Standard deviation
24. When value of a variable have relative importance then we should calculate:
- Simple means
 - Index number
 - Un-weighted index number
 - Weighted arithmetic mean
25. Sum of the deviation from mean is always equal to:
- Zero
 - Constant value
 - Mean
 - Median
26. Mean of a constant value is:
- A.M.
 - Constant itself
 - G.M.
 - H.M.
27. If $\Sigma(x - 100) = 100$, $\Sigma(x - 100) = -100$, $\Sigma(x - 8) = 0$ then AM is:
- 100
 - 8
 - 100
 - 8
28. $\Sigma(x - \bar{X})^2 = \Sigma(x - A)^2$ when:
- $\bar{X} = 5$ and $A = 4$
 - $\bar{X} = 10$, $A = -10$
 - $\bar{X} = A$
 - $\bar{X} > A$
29. Which of the following represents the fiftieth percentile, or the middle point in a set of numbers arranged in order of magnitude?
- Mode
 - Median
 - Mean
 - Variance
30. The _____ is the value you calculate

- when you want the arithmetic average:
- Mean
 - Median
 - Mode
 - All of the above
31. The _____ is often the preferred measure of central tendency if the data are severely skewed:
- Mean
 - Median
 - Mode
 - Range
32. What is the median of this set of numbers: 4, 6, 7, 9, 2000000?
- 7.5
 - 6
 - 7
 - 4
33. What is the mean of this set of numbers: 4, 6, 7, 9, 2000000?
- 7.5
 - 400,005.2
 - 7
 - 4
34. Which of the following is interpreted as the percentage of scores in a reference group that falls below a particular raw score?
- Standard scores
 - Percentile rank
 - Reference group
 - None of the above
35. The median is:
- The middle point
 - The highest number
 - The average
 - Affected by extreme scores
36. Which measure of central tendency takes into account the magnitude of scores?
- Mean
 - Median
 - Mode
 - Range
37. If a test was generally very-easy, except for a few students who had very low scores, then the distribution of scores would be _____.
- Positively skewed
 - Negatively skewed
 - Not skewed at all
 - Normal
38. The most frequently occurring number in a set of values is called the
- (a) Mean (b) Median
 (c) Mode (d) Range
39. As a general rule, the _____ is the best measure of central tendency because it is more precise:
- Mean
 - Median
 - Mode
 - Range
40. Select the following statements which you believe to be true. The median:
- Is a measure of the spread of the data
 - Is a useful summary measure when the data are skewed to the right
 - Is greater than the arithmetic mean when the data are skewed to the right
 - Can be distorted by outliers
41. Select the following statements which you believe to be true:
- The first percentile has 99% of the observations in the ordered set below it
 - The first deciles is equal to the 90th percentile and has 10% of the observations in the ordered set below it
 - The median is equal to the 50th percentile
 - The inter-quartile range lies between the 15th and 3rd deciles
42. The appropriate average for shoe size is:
- A.M
 - G.M
 - Median
 - Mode
43. Select the following statements which you believe to be true. The arithmetic mean of a set of values:
- Is a particular type of variation
 - Is a useful summary measure of location if the data are skewed to the right
 - Coincides with the median if the distribution of the data is symmetrical
 - Is always greater than the

- median
44. Select the following statements which you believe to be true. The geometric mean:
- Is a particular type of variation
 - Lies close to the median if the data are skewed to the right
 - Is always less than the arithmetic mean if the distribution of the data is symmetrical
 - Is a particularly useful summary measure of location if the distribution of the data is skewed to the left
 - ✓ Is obtained by taking the antilogarithm of the arithmetic mean of the log data
45. What is the first step to calculate median from ungrouped data:
- Calculate range of data
 - Determine the relative weight of data
 - ✓ Arrange the data
 - None of above
46. An _____ is the value that represents the data set:
- Sum
 - Total
 - ✓ Average
 - None of these
47. Mode of 2, 5, 9, 7, 8, 3 is:
- 2
 - 5
 - 3
 - ✓ None of these
48. The suitable average for qualitative data is:
- Mean
 - Mode
 - ✓ Median
 - G.M
49. In a symmetrical distribution, the mean is 75, what is value of median:
- 57
 - ✓ 75
 - 50
 - 100
50. In a symmetrical distribution, median is equal to 100, what is the value of mode:
- 10
 - 75
 - 50
 - ✓ 100
51. When mean, median mode is identical then distribution is:
- ✓ Symmetrical
 - Right skewed
 - Left skewed
 - Bi-variate
52. If mean = 35, and median = 32, for skewed data, what is mode:
- 24
 - ✓ 26
 - 28
 - 30
53. For ordinal scale, the best average to measure is:
- ✓ Median
 - AM
 - Mode
 - GM
54. For positively skewed distribution:
- Mean, mode, median are equal
 - Mean, mode, median not equal
 - ✓ Mean is greater than mode
 - Mean is less than, mode
55. For ratio scale the best average to measure is:
- Median
 - ✓ AM
 - Mode
 - GM
56. For symmetrical distribution:
- ✓ Mean, mode, median are equal
 - Mean, mode, median not equal
 - Mean is greater than mode
 - Mean is less than mode
57. To find the growth rate of bacteria in a culture the best average to measure is:
- Median
 - AM
 - Mode
 - ✓ GM
58. When data is in the form of percentages, the best average to measure is:
- Median
 - AM
 - Mode
 - ✓ GM
59. A single value which represents all the values of a data is called as:
- Variable
 - Discrete variable
 - ✓ Average
 - Attribute
60. If $n_1 = n_2 = n_3 = 10$, $\bar{X}_1 = 50$, $\bar{X}_2 = 50$, $\bar{X}_3 = 50$ then combined mean is equal to:
- 10
 - 20
 - ✓ 50
 - 60

61. If $y = x - 2$ then \bar{Y} is:
 (a) \bar{X} (b) $\bar{X} + 2$
 (c) ✓ $\bar{X} - 2$ (d) Zero
62. If $\sum(x - 20) = 40$, $\sum(x - 18) = 0$ then ΣD is:
 (a) -40 (b) 18
 (c) 0 (d) ✓ 40
63. A.M. based on:
 (a) Some values
 (b) Large values
 (c) ✓ All values
 (d) Extreme values
64. A.M. is greatly affected by:
 (a) Two values
 (b) Extra value
 (c) Minor value
 (d) ✓ Extreme values
65. Geometric for 2 and 8 is:
 (a) ✓ 4 (b) 16
 (c) 32 (d) 8
66. When percentage increase in salaries of person in different years is given, the suitable average to calculate average is:
 (a) A.M. (b) ✓ G.M.
 (c) H.M. (d) Median
67. G.M. cannot be calculated when data includes:
 (a) Extreme values
 (b) Highly fluctuated values
 (c) ✓ Negative values
 (d) +ve values
68. G.M. for value: -2, -1, 0, 1, 2, is:
 (a) Zero (b) ✓ Impossible
 (c) -1 (d) +2
69. For negative values, G.M. becomes:
 (a) Finite (b) \bar{X}
 (c) ✓ Imaginary (d) A fix value
70. Types of measuring average are:
 (a) ✓ Measures of location
 (b) Measure of dispersion
 (c) Fundamental rule
 (d) Rules of counting
71. For negatively skewed distribution:
 (a) Mean, mode, median are equal
 (b) Mean, mode, median not equal

- (c) Mean is greater than mode
 (d) ✓ Mean is less than mode
72. For nominal scale the best average to measure is:
 (a) Median (b) AM
 (c) ✓ Mode (d) GM

Measure of Variation

1. Half of the difference between 3rd quartile and 1st quartile is:
 (a) Range
 (b) ✓ Quartile deviation
 (c) Inter quartile range (d) Quartile range
2. Quartile deviation is:
 (a) ✓ $\frac{Q_3 - Q_1}{2}$ (b) $\frac{Q_3 + Q_1}{2}$
 (c) $X_m - X_o$ (d) $\frac{X_m + X_o}{2}$
3. If $Q_1 = 1$ and $Q_3 = 3$ then Q.D. is
 (a) 0 (b) 2
 (c) ✓ 1 (d) 3
4. $|X - \bar{X}|$ is the:
 (a) Mean deviation
 (b) ✓ Absolute deviation
 (c) Quartile deviation
 (d) Standard deviation
5. Mean of absolute deviation from average is:
 (a) Arithmetic mean
 (b) ✓ Mean deviation
 (c) Deviation from mean
 (d) Deviation from average
6. Mean deviation is also named as:
 (a) Standard deviation
 (b) ✓ Median deviation
 (c) Average deviation
 (d) Deviation
7. If $S_x = 2$ and $S_y = 3$ for two independent variable var $(x - y)$ is equal to:
 (a) 5 (b) 8
 (c) 9 (d) 13
8. If $Q_x^2 = 2$ then $2S^2(-2x)$ is:

- (a) $-2S$ (b) $2S^2(x)$
 (c) $2S(x)$ (d) $\checkmark 4S^2(x)$
9. Difference of two extreme values is:
 (a) Q.D (b) Range
 (c) M.D (d) S.D
10. Measures related to the shape of distribution are:
 (a) Measures of location
 (b) \checkmark Moments
 (c) Measures of dispersion
 (d) None of these
11. Average of deviations to which powers are raised are:
 (a) Average deviations
 (b) Dispersions
 (c) \checkmark Moments
 (d) Quartile deviation
12. If Mean = Median = Mode, then distribution is:
 (a) Skewed (b) \checkmark Symmetrical
 (c) Leptokurtic (d) Platykurtic
13. If Mean > Median > Mode, distribution is:
 (a) \checkmark + ve skewed
 (b) - ve skewed
 (c) Symmetrical
 (d) None of these
14. If Mode > Median > Mean, distribution is:
 (a) + ve skewed
 (b) Symmetrical
 (c) \checkmark - ve skewed
 (d) Normal
15. When referring to a curve that tails off to the right end, one would call it:
 (a) Symmetrical
 (b) \checkmark Positively skewed
 (c) Negatively skewed
 (d) Normal
16. If mean of a distribution is 50 and coefficient of variation (CV) is 10% then SD:
 (a) 2 (b) 3
 (c) 4 (d) \checkmark 5
17. A set of data has mean 4.3 and standard deviation 2.5. Each observation is multiplied by 10 and the result decreased by 2. The mean and standard deviation, of the transformed data is:
 (a) \checkmark 41.0, 23.0 (b) 2.3, 0.5
 (c) 3, 2.5 (d) 1.0, 25.0
18. When an instrument/test gives the same reading every 0 time in the same conditions, its SD is:
 (a) Positive (b) Negative
 (c) One (d) \checkmark Zero
19. The distance between highest and lowest values is called:
 (a) Standard error
 (b) Standard deviation
 (c) \checkmark Range (d) Mode
20. Range is based on:
 (a) \checkmark Two values (b) Some values
 (c) All values (d) Three values
21. The mean of a distribution is 14 and the standard deviation is 5. What is the value of the coefficient of variation?
 (a) 60.4% (b) 48.3%
 (c) 27.8% (d) \checkmark 35.7%
22. Best method of variability is:
 (a) Mean (b) Median
 (c) Range (d) Standard deviation
23. Mean of 400 values is 100 and standard deviation is 8. What will be coefficient of variation?
 (a) 0.4 (b) 1.0
 (c) 2.0 (d) 4.0
24. Measure of variation is:
 (a) Mean (b) Median
 (c) Mode (d) \checkmark Range
25. Co-efficient of variation can be calculated if the value of the following is known:
 (a) Standard deviation & standard error
 (b) Standard error & mean
 (c) \checkmark Standard deviation & mean
 (d) Standard error & number of

- observations
26. The proportions of observation which lie within 3 times of standard deviation from the mean:
 (a) 68.27% (b) 95.45%
 (c) 79.36% (d) ✓ 99.73%
27. A poor measure of dispersion is:
 (a) M.D. (b) Q.D.
 (c) Percentiles (d) ✓ Range
28. Coefficient of Q.D. is:
 (a) $\frac{Q_3 + Q_1}{Q_3 - Q_1}$ (b) $\frac{Q_3 + Q_1}{2}$
 (c) ✓ $\frac{Q_3 - Q_1}{Q_3 + Q_1}$ (d) $\frac{Q_3 - Q_1}{2Q_3 + Q_1}$
29. If sum of squared deviation from means is 64 for 16 values, then standard deviation is:
 (a) ✓ 2 (b) 4
 (c) 16 (d) None of these
30. Sum of deviation from $x = 10$ and sum of squared deviation from $x = 10$ for 100 value are 20 and 400 respectively. Mean and variance are:
 (a) 10 and 4 (b) ✓ 10.2 and 3.96
 (c) 12 and 5 (d) 11 and 5
31. Square of standard deviation is:
 (a) Squared variation
 (b) Mean deviation
 (c) ✓ Variance
 (d) Coefficient deviation from
32. If a distribution is skewed to the left, then it is:
 (a) ✓ Negatively skewed
 (b) Positively skewed
 (c) Symmetrically skewed
 (d) Symmetrical
33. A report on the distribution of fill weights for syrup bottles says that, "The variation was very small, in fact the SD of the weights for the 25 bottles we weighted was only $SD = -0.12$ ". What's wrong with this statement?
 (a) SD is too small
 (b) Sample size is too small
 (c) We need mean also

- (d) ✓ SD can never be negative
34. State whether the data reflecting the salaries of all employees in a medical school are likely to be skewed to the right, skewed to the left or symmetrical?
 (a) ✓ Skewed to the right
 (b) Skewed to the left
 (c) Symmetrical
 (d) None of these
35. State whether the data reflecting the heights of individuals in the general population are likely to be skewed to the right, skewed to the left or symmetrical:
 (a) Skewed to the right
 (b) Skewed to the left
 (c) ✓ Symmetrical
 (d) None of these
36. Which of the following is NOT a measure of variability?
 (a) ✓ Median (b) Variance
 (c) Standard deviation
 (d) Range
37. Which of the following is NOT a common measure of central tendency?
 (a) Mode (b) ✓ Range
 (c) Median (d) Mean
38. Which of the following is the formula for range?
 (a) $H + L$ (b) $L \times H$
 (c) $L - H$ (d) ✓ $H - L$
39. Which is a raw score that has been transformed into standard deviation units?
 (a) ✓ z score (b) SDU score
 (c) t score (d) e score
40. Why are variance and standard deviation the most popular measures of variability?
 (a) ✓ They are the most stable and are foundations for more advanced statistical analysis
 (b) They are the most simple to calculate with large data sets
 (c) They provide nominally scaled

41. data
 (d) None of the above
42. The denominator (bottom) of the z-score formula is:
 (a) ✓ The standard deviation
 (b) The difference between a score and the mean
 (c) The range (d) The mean
43. The standard deviation is:
 (a) The square root of the variance
 (b) A measure of variability
 (c) An approximate indicator of how numbers vary from the mean
 (d) All of the above
44. If the mean of a normal distribution is 20 and its standard deviation is 5, then 95% of the data lie within which of the following ranges?
 (a) 15.0, 25.0 (b) ✓ 10.2, 29.8
 (c) 7.1, 32.9 (d) None of these
45. Select the following variables that are likely to follow a normal distribution:
 (a) The number of hospital attendances in a year in a sample of adults from the general population.
 (b) Survival times following a heart transplant.
 (c) ✓ Heights of individuals in the population
 (d) The ages of first year medical students
46. To compare the variation of two data set, we use:
 (a) Variance
 (b) Standard deviation
 (c) Range
 (d) ✓ Coefficient of variation
47. If mean = 40 and variance = 64, the coefficient of variation is:
 (a) 5% (b) 10%
 (c) 15% (d) ✓ 20%
48. Dispersion is:
 (a) ✓ Spread from-average
 (b) Spread from mid points
- (c) Range (d) Variable Mean of squared deviations from arithmetic mean is:
 (a) ✓ Variance
 (b) Mean deviation
 (c) Average deviation
 (d) None of these
49. Percentage ratio of standard deviation to the mean is:
 (a) Percentage component bar
 (b) Coefficient of M.D.
 (c) Coefficient of standard deviation
 (d) ✓ Coefficient of variation
50. $\Sigma(X - \bar{X})^2$ is the:
 (a) Sum of squared deviations from an assumed mean
 (b) ✓ Sum of squared deviations from the arithmetic, mean
 (c) Sum of the spread
 (d) Sum of the spread from mean
51. Coefficient of standard deviation is:
 (a) $\left(\frac{S^2}{\bar{X}} \right) \times 100$
 (b) $\frac{M.D.}{\bar{X}}$
 (c) ✓ $\frac{S}{\bar{X}}$ (d) $\frac{M.D.}{\text{Median}}$
52. Coefficient of variation is:
 (a) $\frac{S}{\bar{X}} \times 100$ (b) $\frac{\text{Variance}}{\text{Mean}}$
 (c) ✓ $\frac{M.D.}{\bar{X}}$ (d) $\frac{S}{\bar{X}}$
53. Absolute dispersion which can be computed from mean, median and mode is:
 (a) Range (b) Q.D
 (c) ✓ M.D (d) $\frac{S}{\bar{X}}$
54. Mean deviation from median is:
 (a) Maximum (b) ✓ Minimum
 (c) Greater than mean
 (d) Less than median
55. Sum of absolute deviation from mean for 10 values is 50, mean deviation

- will be:
 (a) 5.5 (b) 5.3
 (c) 5.2 (d) ✓ 5.0
56. If mean deviation is 6 and A.M. is 10, then coefficient of M.D. is:
 (a) ✓ 0.6 (b) 0.5
 (c) $\frac{1}{4}$ (d) 0.35
57. Positive square root of mean of squared deviation from A.M. is:
 (a) Variance
 (b) Coefficient of variation
 (c) ✓ Standard deviation
 (d) Squared deviation
58. Type of dispersion is:
 (a) A.M (b) Median
 (c) ✓ Average deviation
 (d) Mode
59. Standard deviation is:
 (a) Relative dispersion
 (b) ✓ Absolute deviation
 (c) Deviation from standard normal variate
 (d) None of these
60. Range of 5, 0, 2, 9, 12, 16, 14 is:
 (a) ✓ 16 (b) 9
 (c) 14 (d) 12
61. Coefficient of variation is a kind of:
 (a) Absouli dispersion
 (b) ✓ Relative dispersion
 (c) Skewness (d) Symmetry
62. Larger the coefficient of variation then smaller the:
 (a) Standard deviation
 (b) A.M
 (c) ✓ Consistency
 (d) Skewness
63. The standard deviation of -2, -2, -2, -2, is:
 (a) Positive (b) Negative
 (c) One (d) ✓ Zero
64. Variance is always:
 (a) ✓ A positive Quantity
 (b) Negative quantity
 (c) Zero
 (d) All of the above
65. When precision is high then standard deviation will be:
 (a) High (b) Zero
 (c) ✓ Low
 (d) All of the above
66. When temperature, of 10 patients is measured on both centigrade and KS, then on standard deviation of both measurement will be:
 (a) Different (b) Zero
 (c) ✓ Same (d) None of these

Probability

1. $E(a + bX) =$
 (a) $bE(X)$ (b) ✓ $a + bE(X)$
 (c) $E(X)$ (d) $E(a)$
2. $E(a) =$
 (a) Zero (b) 1
 (c) ✓ a (d) z
3. $E(x + y) =$
 (a) $\Sigma(x + y)$ (b) ✓ $E(x) + E(Y)$
 (c) $\Sigma(x + y) P(x)$
 (d) None of these
4. $E(X) =$
 (a) $\Sigma P(x)$ (b) ✓ $\Sigma xP(x)$
 (c) $E[X^2 P(x)]$ (d) None of these
5. $E[X - E(X)]^2 =$
 (a) $E[(X) - E(X)]^2$
 (b) $E[(X^2) - E(X^2)]^2$
 (c) ✓ $E(X)^2 - [E(X)]^2$
 (d) $[E(X^2)]^2 - [E(X)]^2$
6. Each double digit random number is assumed to have probability of:
 (a) $\frac{1}{10}$ (b) $\frac{1}{15}$
 (c) $\frac{1}{20}$ (d) ✓ 0.011
7. Each single digit random number is assumed to have probability of:
 (a) ✓ $\frac{1}{9}$ (b) $\frac{1}{10}$
 (c) $\frac{1}{11}$ (d) $\frac{1}{12}$
8. Events that cannot happen together are called:

- (a) ✓ Mutually exclusive events
 (b) Independent events
 (c) Dependent events
 (d) Equally likely events
9. Events that have same chance of occurrence are called:
 (a) Mutually exclusive events
 (b) Independent events
 (c) Dependent events
 (d) ✓ Equally likely events
10. Following probability density function is related with normal distribution:
 (a) $\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$
 (b) $\frac{1}{\sqrt{\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\delta}\right)^2}$
 (c) ✓ $\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\delta}\right)^2}$
 (d) $n C_x p^x q^{n-x}$
11. For a normal distribution β_1 is:
 (a) 3 (b) 2
 (c) 1 (d) ✓ 0
12. For a normal distribution all of the following are true EXCEPT that:
 (a) Mean, median and mode are equal
 (b) ✓ The distribution is bi-modal
 (c) It is bell-shaped.
 (d) Meant \pm SD contains almost 68.26% area of curve
13. For any two events 'A' and 'B' $P(A \cup B)$ is equal to:
 (a) ✓ $P(A) + P(B) - P(A \cap B)$
 (b) $P(A) + P(B)$
 (c) $P(A) - P(A \cap B)$ (d)
 $P(B) - P(A \cap B)$
14. For x and y independent random variables $\text{var}(x - y) =$
 (a) $\text{var}(X) - \text{var}(Y)$
 (b) $\text{var}(Y)$
 (c) ✓ $\text{var}(X) + \text{var}(Y)$
 (d) None of these
15. Health department has reported that 84 deaths are due to accidents, 16 from cancer and 40 from heat failure. The probability of death due to accident is 60%, the Health Department used:
 (a) Classical approach
 (b) ✓ Posterior approach
 (c) Axiomatic approach
 (d) Normal approach
 (e) None approach
16. Heights of students is:
 (a) Discrete variable
 (b) Constant
 (c) ✓ Continuous variable
 (d) None of these
17. If $\mu = 30$ and $\sigma = 10$ for normal distribution then area towards right side of $\mu = 30$ is:
 (a) 30% (b) 40%
 (c) 50% (d) 100%
18. If 'A' and 'B' events are mutually exclusive then $P(A \cup B)$ is equal to:
 (a) 1 (b) ✓ $P(A) + P(B)$
 (c) $P(A) + P(B) - P(A \cap B)$
 (d) $P(A \cup B) > 1$
19. If 'n' is very large and neither 'p' nor 'q' is very small the distribution for such situation is called as:
 (a) Binomial distribution
 (b) ✓ Normal distribution
 (c) Skewed distribution
 (d) Bernoulli distribution
20. If 'p' is probability pf success, 'q' is probability of failure then probability of 'x' success out of "n" trials can be defined by a distribution called as:
 (a) Hyper geometric
 (b) Bernoulli
 (c) ✓ Binomial (d) Normal
21. If a normal distribution has meant and standard deviation 50 and 8 respectively then second moment about mean will be equal to:
 (a) 8 (b) ✓ 64
 (c) 16 (d) 4
22. If binomial probability distribution is

- multiplied by the large number of experiment N, distribution is called as:
- Frequency distribution
 - Binomial frequency dist
 - ✓ Binomial probability function
 - None of these
23. If event 'A' consists of numbers which are divisible by 4 in rolling a die, then P(A) is equal to:
- $\frac{1}{2}$
 - $\frac{1}{3}$
 - ✓ $\frac{1}{6}$
 - $\frac{3}{2}$
24. If Hb level in healthy women has mean. 13.5 g/dl and standard deviation 1.5 g/dl, what is the Z-value for a woman with Hb level 15 g/dl?
- 9.0
 - 10.0
 - 2.0
 - 1.0
25. If mean = 5 and S.D = 4 then:
- Binomial distribution can be applied
 - Binomial distributions impossible
 - Hyper geometric is applied
 - ✓ Normal distribution is applied
26. If mean and variance of binomial distribution are 5 and 2.5 respectively parameters of binomials distribution are:
- 5 and $\frac{1}{2}$
 - ✓ 10 and $\frac{1}{2}$
 - 10 and $\frac{1}{4}$
 - 10 and $\frac{3}{4}$
27. If mean of normal distribution is 50 then median and mode respectively are:
- ✓ 50 and 50
 - Zero and 25
 - 10 and 50
 - None of these
28. If $n = 10$ and $p = \frac{1}{2}$ then mean and variance of binomial distribution respectively are:
- 5 and 3
 - 3 and 5
 - ✓ 5 and 2.5
 - 3 and 2.5
29. If $n = 4$, $P = 0.3$ then 'q' is:
- ✓ 0.7
 - 0.8
 - 0.9
 - 0.6
30. If $n = 5$ and $p = \frac{1}{2}$ mean of binomial dist:
- ✓ 2.5
 - $\frac{1}{2}$
 - $\frac{1}{4}$
 - 2.9
31. If normal population has variance = 10 then fourth moment about mean is equal to:
- 200
 - ✓ 300
 - 400
 - 1000
32. If $P \neq q$ then binomial distribution becomes:
- ✓ Skewed
 - Symmetrical
 - Normal
 - None of these
33. If $P < \frac{1}{2}$ or $p < q$ then binomial distribution becomes:
- Symmetrical
 - ✓ Positive skewed
 - Negative skewed
 - Zero
34. If $P = \frac{3}{4}$ and $q = \frac{1}{4}$ binomial distribution becomes:
- Right tailed skewed
 - ✓ Left tailed skewed
 - Symmetrical
 - Normal
35. If $p = \frac{1}{2}$ and $q = \frac{1}{2}$ binomial distribution becomes:
- Skewed
 - ✓ Symmetrical
 - +ve skewed
 - ve skewed
36. If $p = q$ then binomial distribution becomes:
- Skewed
 - +ve skewed
 - Zero
 - ✓ Symmetrical
37. If $p > \frac{1}{2}$ or $p > q$ then binomial distribution becomes:
- ✓ Negative skewed
 - Positive skewed

- (c) Symmetrical
(d) None of these
38. If $P(A) = 0.45$, $P(B) = 0.35$, and $P(A \text{ and } B) = 0.25$, then $P(A|B)$ is:
(a) 1.4 (b) 1.8
(c) ✓ 0.714 (d) 0.556
39. If set 'A' and set 'B' have some common elements then it will be written as:
(a) $A \cup B$ (b) ✓ $A \cap B$
(c) $A \cap \bar{B}$ (d) $\bar{A} \cap B$
40. If there are not any common elements in two sets A and B then they are:
(a) United sets (b) Finite sets
(c) ✓ Disjoint sets
(d) Infinites sets
41. If $x - N(100, 100)$ then points of inflection are:
(a) 10 and 100 (b) 100 and 110
(c) ✓ 90 and 110 (d) 0 and 200
42. If $x - N(25, 64)$ then mean and standard deviation of normal distribution respectively are:
(a) 25 and 16 (b) ✓ 25 and 8
(c) 5 and 8 (d) None of these
43. If X and Y are independent random variables then $E(XY)$ is equal to:
(a) $\sum(xy) P(X)$ (b) $E(X) + E(Y)$
(c) ✓ $E(X)E(Y)$ (d) Variance of x
44. If x and y are independent random variables then $\text{Var}(3x - y) =$
(a) $3 \text{ var}(X) - \text{var}(Y)$
(b) $9 \text{ var}(X) - \text{var}(Y)$
(c) ✓ $9 \text{ var}(X) + \text{var}(Y)$
(d) $3 \text{ var}(X) + \text{var}(Y)$
45. If x and y are independent random variables then $\text{Var}(x + y) =$
(a) ✓ $\text{var}(X) + \text{var}(Y)$
(b) $\sqrt{\text{var}(X) + \text{var}(Y)}$
(c) $\frac{1}{2} \text{ var}(X) + \frac{1}{2} \text{ var}(y)$
(d) None of these
46. In binomial distribution 'n' number of trials are:
(a) Infinite (b) Very large
47. (c) ✓ Limited (d) 2
In binomial distribution range of values of variable x is:
(a) From 1 to n (b) ✓ From 0 to n
(c) From $-\infty$ to $+\infty$
(d) From 0 to $+\infty$
48. In normal distribution the mean, median, mode:
(a) ✓ All are equal
(b) Not equal
(c) Median is greater than mode and mean
(d) None of these
49. In which of the following binomial distributions is the normal approximation appropriate:
(a) $n = 50, p = 0.01$
(b) $n = 500, p = 0.001$
(c) ✓ $n = 100, p = 0.05$
(d) $n = 50, p = 0.02$
50. In which probability distribution mean and variance are equal:
(a) Normal distribution
(b) Binomial distribution
(c) ✓ Poisson distribution
(d) Chi-square
51. Maximum ordinate of normal distribution when $\mu = 50, \sigma = 6$, and $x = 50$ is equal to:
(a) $\frac{22}{7}$ (b) ✓ 0.0665
(c) $\frac{1}{6}$ (d) 0.6745
52. Mean deviation of normal distribution is equal to:
(a) $\frac{1}{4}$ (b) $\frac{1}{2}\sigma$
(c) ✓ $\frac{4}{5}\sigma$ (d) 0.6745 σ
53. Mean of binomial distribution is:
(a) npq (b) nq
(c) pq (d) ✓ np
54. ${}^n C_r =$
(a) $\frac{n!}{(n-r)!}$ (b) $\frac{n!}{r!}$

- (c) $\frac{n!}{r(n-r)!}$ (d) $\frac{n!}{n_1!n_2!\dots n_k!}$
55. Normal curve is:
 (a) ✓ Symmetrical
 (b) Linear
 (c) Curvilinear
 (d) Skewed
56. Normal distribution is a:
 (a) Skewed distribution
 (b) +ve skewed distribution
 (c) -ve skewed distribution
 (d) ✓ Symmetrical distribution
57. Normal distribution is a:
 (a) ✓ Unimodal distribution
 (b) Bimodal distribution
 (c) Trimodal distribution
 (d) Multimodal distribution
58. Normal distribution was discovered by:
 (a) ✓ Abraham De McIver
 (b) Karl Pearson
 (c) R.A Fisher (d) K F Gauss
59. ${}^n P_r$ is equal to:
 (a) $\frac{n!}{r(n-r)!}$ (b) $\frac{n!}{r!}$
 (c) ✓ $\frac{n!}{(n-r)!}$ (d) None of these
60. Number of heads in. tossing 3 coins is:
 (a) Continuous random variable
 (b) Constant value
 (c) Simple variable
 (d) ✓ Discrete random variable
61. Number of insured homes against fire is:
 (a) House hold budget method
 (b) Deviated variable
 (c) ✓ Discrete variable
 (d) None of these
62. Poisson distribution has/have parameter:
 (a) ✓ One (b) Two
 (c) Three (d) Four
63. Probability function can never be:
 (a) Zero (b) Positive

- (c) Less than 1 (d) ✓ Negative
64. Probability function of binomial distribution is:
 (a) $p^x q^{n-x}$ (b) $p^x q^x$
 (c) $\frac{e^{-\mu} \mu^x}{x!}$ (d) ✓ ${}^n C_x p^x q^{n-x}$
65. Probability of success + probability of failure is equal to:
 (a) ✓ 1 (b) 0
 (c) $1-p$ (d) $1-q$
66. Probability of success in binomial distribution:
 (a) Changes from trial to trial
 (b) ✓ Remains unchanged
 (c) Equal to 1 (d) Equal to zero
67. Probability of x can never be:
 (a) + ve (b) Zero
 (c) ✓ - ve (d) 1
68. Probability of x lies between:
 (a) $-\infty$ to $+\infty$ (b) ✓ 0 to 1
 (c) 0 to $+\infty$ (d) -1 to +1
69. $q + p =$
 (a) n (b) ✓ 1
 (c) Zero (d) >1
70. Quartile deviation of normal distribution is equal to:
 (a) $\frac{4}{5}\sigma$ (b) 0.7373 σ
 (c) ✓ 0.6745 σ (d) 99.73% σ
71. Range of continuous random variable is:
 (a) From 0 to 1
 (b) ✓ From $-\infty$ to $+\infty$
 (c) From 0 to $+\infty$
 (d) From -1 to +1
72. Range of normal distribution is:
 (a) From 0 to n (b) 0 to $+\infty$
 (c) ✓ $-\infty$ to $+\infty$ (d) 1 to $+\infty$
73. Sample space of 2 dice consists of:
 (a) 10 outcomes
 (b) One outcome
 (c) ✓ 36 outcomes
 (d) 6 outcomes
74. Statistical tests involving binomial distribution are used whenever the

- number of trials,
- Relatively large
 - ✓ Relatively small
 - Infinite
 - All above
75. Statistical uncertainty (probability) arises due to:
- Lack of knowledge
 - ✓ Various types of variation
 - Small sample size
 - Large sample size
76. Sum of the product of values of discrete random variable and the corresponding probabilities is:
- Variance of x
 - ✓ Expectation of x
 - S.D of x
 - S.E of x
77. Sum of the probabilities is equal to:
- 1
 - ✓ +1
 - 0
 - 0
78. Sum of the product of values of random variable x and their corresponding probabilities is:
- $\Sigma p(x)$
 - ✓ Expected value of x
 - Variance of x
 - $F(x)$
79. The area under normal curve within 2 SD of means is:
- 99.99%
 - 99.73%
 - 68.26%
 - ✓ 95.44%
80. The area under normal curve within 3 SD of means is:
- 68.26%
 - 95.44%
 - ✓ 99.73%
 - 99.99%
81. The function which gives the probability of event that x takes a value less than or equal to a specified value x is called:
- Probability distributions
 - ✓ Distribution function
 - Relative function
 - Probability function
82. The number of parameters of binomial distribution is:
- 3
 - ✓ 2
 - > 3
 - None of these
83. The probability of a sure event is:
- ✓ 1
 - 0
 - 1
 - $\frac{1}{2}$
84. The probability of Rh - ve is $1/10$, which is true probability for Rh +ve:
- $\frac{1}{10}$
 - ✓ $\frac{9}{10}$
 - $\frac{3}{10}$
 - 10%
85. The probability that a delicate heart operation will success is $\frac{1}{3}$, the probability a operation will fail to next patient is
- $\frac{3}{2}$
 - $\frac{1}{3}$
 - ✓ $\frac{2}{3}$
 - $\frac{6}{3}$
86. The random variable X has a normal distribution with mean 5.75 and variance 2.56. The probability that X lies between 4.15 and 7.35 is:
- 0.438
 - 0.118
 - 0.242
 - ✓ 0.6826
87. The results of a trial in binomial dist are classified as:
- n and p
 - Mean and variance
 - ✓ Success or failure
 - Success only
88. The tables which are constructed in such a way that all digits from 0 to 9 i.e. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 have approximately the same probability of occurrence are called as:
- Statistical tables
 - Complex tables
 - ✓ Random number table
 - None of these
89. The numbers of parameters in normal distribution are:
- 1
 - ✓ 2
 - 3
 - 4
90. Third moment about mean of normal distribution is:

- (a) Greater than zero
 (b) Less than zero
 (c) ✓ Zero (d) 1
91. Total area under the curve for a complete probability density function is always equal to:
 (a) Zero (b) ✓ 1
 (c) Greater than 1
 (d) Less than zero
92. Total area under the normal curve is equal to:
 (a) 0 (b) ✓ 1
 (c) 2 (d) 3
93. $\text{Var} \left[\frac{1}{4}X + 3 \right]$
 (a) $\frac{1}{4} \text{ var}(X) + 3$
 (b) ✓ $\frac{1}{16} \text{ var}(X)$
 (c) $\frac{1}{4} \text{ var}(X)$ (d) Zero
94. $\text{Var}(3x - 2)$:
 (a) $1 \text{ var}(X) - 2$
 (b) $3 \text{ var}(X) + 2$
 (c) $3 \text{ var}(X)$ (d) ✓ $9 \text{ var}(X)$
95. $\text{Var}(ax - b) =$
 (a) $a^2 \text{ var}(X) + b$
 (b) $a \text{ var}(X)$
 (c) ✓ $a^2 \text{ var}(x)$ (d) $a \text{ var}(x) + b$
96. $\text{Var}(ax) =$
 (a) $\text{Var}(X)$ (b) A $\text{var}(X)$
 (c) Zero (d) ✓ $a^2 \text{ var}(X)$
97. $\text{Var}(x - 100) =$
 (a) 100 (b) ✓ $\text{Var}(X)$
 (c) $\text{Var}(X) - 100$
 (d) - 100
98. $\text{Var}(x - a) =$
 (a) ✓ $\text{Var}(X)$ (b) VAr(X) - a
 (c) $\text{Var}(X) + a$ (d) Zero
99. Variance of $(x + a)$ is:
 (a) $\text{Var}(X) + a$ (b) $\text{Var}(a)$
 (c) A $\text{var}(X)$ (d) ✓ $\text{Var}(X)$
100. Variance of binomial distribution is:
 (a) ✓ npg (b) pq
 (c) pq^2 (d) np^2q
101. Variance of x can be formulated as:
- (a) ✓ $\Sigma x^2 P(x) - [\Sigma x p(x)]^2$
 (b) $E(X^2) - E(X)^2$
 (c) $[\Sigma x^2 P(x)]^2 - [\Sigma x P(X)]^2$
 (d) None of these
102. What is probability that a person is anemic patient?
 (a) 0.40 (b) 1.0
 (c) 0.00
 (d) ✓ Insufficient information
103. When a selection of ' r ' objects is made without making any order of arrangement out of total ' n ' objects, it will be called as:
 (a) Suitable drawing
 (b) Ordered arrangement
 (c) Combination
 (d) ✓ Permutation
104. When three coins are tossed the event of at least one head is:
 (a) Mutually exclusive event
 (b) Exhaustive event
 (c) ✓ Compound event
 (d) Dependent event
105. When two events have equal chance for the occurrence, the events would be:
 (a) ✓ Equally likely
 (b) Mutually exclusive
 (c) Equal spaced
 (d) Compound
106. When you are going to calculate the conditional probability of an event, the sample space:
 (a) ✓ Reduces (b) Increases
 (c) Remained same
 (d) None of these
107. An event consisting of more than one outcomes is called as:
 (a) Computed event
 (b) ✓ Compound event
 (c) Dependent event
 (d) None of these
108. An event consisting of only one outcome is:
 (a) Mutually exclusive event
 (b) Equally likely event

- (c) Independent event
 (d) ✓ Simple event
109. Any subset of the sample space which consists of one or more outcomes is called as an:
 (a) Exclusive event
 (b) Outcome
 (c) ✓ Event (d) Experiment
110. Area between two points of inflection is:
 (a) 0.9973 (b) ✓ 9.6827
 (c) 0.5 (d) 1
111. Area of normal distribution which differ from mean by more than 2σ is:
 (a) 0.0455 or about 5%
 (b) 0.7979 or about 80%
 (c) 0.6745 or about 68%
 (d) ✓ 0.9545 or about 95%
112. Area of normal distribution which differ from mean by no more than 3σ is:
 (a) 0.6745 (b) 0.8071
 (c) ✓ 0.9973 (d) 0.9045
113. Area of normal distribution which differs from mean by more than 3σ is:
 (a) 0.9545 or about 95%
 (b) ✓ 0.027 or about 0.3%
 (c) 0.455 or about 5%
 (d) 0.8071
114. Area of normal distribution which differ from mean by no more than 2σ is:
 (a) 0.7979 (b) 0.6745
 (c) ✓ 0.9545 (d) 0.9973
115. BP of people follows:
 (a) ✓ Normal distribution
 (b) Binomial distribution
 (c) Uniform distribution
 (d) Poisson distribution
116. Classical definition of probability may also be called as:
 (a) Relative frequency definition
 (b) ✓ Priori definition
 (c) Posteriori definition
 (d) Axiomatic definition
117. Coin tossing is the example of:
 (a) ✓ Random experiment
 (b) Combination
 (c) Permutation
 (d) None of these
118. For known population variance, the confidence interval for population mean is based on:
 (a) Binomial distribution
 (b) Poisson distribution
 (c) t-distribution
 (d) ✓ Normal distribution
119. If $u = \{2, 3, 4, 5\}$, $A = \{2, 4\}$ then \bar{A} is equal to:
 (a) {3, 6} (b) ✓ {3, 5}
 (c) {1, 2, 3} (d) {2, 3, 4}
120. If 'n' is any integer, then product of first 'n' integers is:
 (a) nC_r (b) nP_r
 (c) ✓ $n!$ (d) None of these
121. If events can make the entire sample space, the events are said to be:
 (a) Mutually exclusive
 (b) Independent
 (c) ✓ Exhaustive (d) Simple
122. If occurrence of an event 'A' does not affect the occurrence or non occurrence of other event 'B', Events will be:
 (a) Equally likely
 (b) Dependent
 (c) ✓ Independent
 (d) Exhaustive
123. If $P = \frac{1}{4}$, $q = \frac{3}{4}$ binomial distribution becomes:
 (a) ✓ Right tailed skewed
 (b) Left tailed skewed
 (c) Symmetrical
 (d) None of these
124. If the occurrence of event 'A' affects the occurrence of event 'B', Events are called as:
 (a) Described events
 (b) Independent events
 (c) ✓ Dependent event
 (d) Compound events

125. If the random variable z is the standard normal score, which of the following probabilities could easily be determined without referring to a table?
- $P(z > 2.86)$
 - $P(z < 0)$
 - $P(z < -1.82)$
 - $P(z > -0.5)$
126. If x is normally distributed with mean μ and variance 10 and if $y = 3x - 2$ then mean of ' y ' will be equal to:
- 2
 - 3
 - 4
 - 5
127. Individual results of a sample space are:
- Selections
 - Compound events
 - Out comes
 - None of these
128. Let $A = \{2, 4, 6\}$, $B = \{1, 3, 5\}$ then $(A \cap B)$ is equal to:
- {2}
 - {3, 5}
 - \emptyset
 - {6}
129. List of all possible results of a random experiment is called as:
- Population
 - Sample
 - Sample space
 - Experiment
130. ${}^n C_n - 1 =$
- $n!$
 - $(n - 1)!$
 - n
 - 1
131. The area of normal distribution which differs from mean by no more than σ is:
- Zero
 - 0.1340
 - 0.876
 - 0.6827
132. The experiment which is repeated a large number of times and which produces different results is called as:
- Random selection
 - Random experiment
 - Binomial experiment
 - Normal experiment
133. The probability distribution of rare event is:
- Normal distribution

- (b) Binomial distribution
 (c) Uniform distribution
 (d) Poisson distribution
134. The probability function of Poisson distribution is:
- $p^x q^{n-x}$
 - $p^x q^x$
 - $\frac{e^{-\mu} \mu^x}{x!}$
 - $n C_x p^x q^{n-x}$
135. The probability of an impossible event is:
- Zero
 - One
 - Between zero & one
 - $\frac{1}{2}$
136. The probability of positive test among diseased persons ($P(+ / D)$) is unknown as:
- Specificity
 - Sensitivity
 - PPV
 - NPV
137. The probability that a dead person with normal BP is:
- 1
 - Zero
 - Unknown
 - Between 0 and +1
138. The probability that a person will contract a certain disease is:
- 1
 - Zero
 - Unknown
 - Between 0 and +1
139. Union of A, B and C exhaustive events are equal to:
- $A \cup B$
 - Sample space
 - $B \cup C$
 - $A \cup C$
140. When 'A' and 'B' are any two independent events, then multiplication law says that $P(A \cap B)$ is equal to:
- $P(A) + P(B)$
 - $P(A) \cdot P(B/A)$
 - $P(A \cap B)$
 - $P(A) \cdot P(B)$
141. When 'A' and 'B' are two mutually exclusive events then $P(A \cup B)$ is equal to:
- $P(A) + P(B)$
 - $P(A) \cdot P(B)$
 - $P(A) - P(A \cap B)$

- (d) $P(B) - P(A \cap B)$
142. When A and B are independent events then $P(A/B)$ is equal to:
 (a) $P(B)$ (b) $\checkmark P(A)$
 (c) $P(A \cap B)$ (d) $\frac{P(A \cap B)}{P(B)}$
143. When A and B are independent events then $P(B/A)$ is equal to:
 (a) $\checkmark P(B)$ (b) $P(A)$
 (c) $P(A \cap B)$ (d) $\frac{P(A \cap B)}{P(B)}$
144. When A, B, C are mutually exclusive and exhaustive events, the $P(A \cup B \cup C)$ is equal to:
 (a) 0 (b) Less than 1
 (c) $\checkmark 1$
 (d) Between 0 and 1.
145. When two dice are rolled, then event $A = \{1, 1\}$ is:
 (a) \checkmark Compound event
 (b) Simple event
 (c) Separate event
 (d) None of these
146. When two events 'A' and 'B' have not any common points, events are:
 (a) Equally likely
 (b) Compound
 (c) \checkmark Mutually exclusive
 (d) Simple
147. The weight of each of the 10 babies born in a hospital was 2.5Kg. Considering the distribution is normal then the standard deviation is:
 (a) 1 (b) \checkmark Zero
 (c) 2.5 (d) 10
148. Non-overlapping categories or intervals are known as _____
 (a) Inclusive (b) Exhaustive
 (c) \checkmark Mutually exclusive
 (d) Mutually exclusive and exhaustive
149. Consider the two events - an individual belonging to blood group A (probability = 0.42) and the individual getting 'head' when tossing a coin (probability = 0.50).

- Select all of the following statements which you believe to be true.
- (a) The two events are mutually exclusive
 (b) \checkmark The two events are independent
 (c) The probability of the individual both belonging to blood group A and getting a head is $0.42 + 0.50 = 0.92$
 (d) The probability that the individual does not belong to blood group A is 0.58
150. The area of normal distribution which differs from mean by more than σ is:
 (a) 0.3173 (b) 0.8561
 (c) 0.6745 (d) 0.7979
151. If $U = \{a, b, c, d, e\}$ and $A = \{c, d, e\}$ then $U - A$ is:
 (a) \checkmark Complement of A
 (b) Sub set of A
 (c) Union of B
 (d) Intersection of B
152. $6! =$
 (a) 420 (b) 520
 (c) 620 (d) \checkmark 720
153. $\Sigma P(x)$ is equal to:
 (a) 0 (b) \checkmark 1
 (c) -ve (d) Grater than 1
154. $\Sigma x^2 P(X)$ is:
 (a) $E(X)$ (b) $E[P(x)]$
 (c) $\checkmark E(X^2)$ (d) $E[X^2 P(X)]$
155. 'p' is the probability of success and 'q' is:
 (a) Probability of trial
 (b) Probability of constant
 (c) \checkmark Probability of failure
 (d) None of these.
156. A function which can provide probabilities for continuous random variable is known as:
 (a) Distribution function
 (b) Probability distribution
 (c) \checkmark Probability density function
 (d) None of these
157. A random variable which assume whole number and finite number of

- values is called as:
- Continuous random variable
 - Deviate variable
 - ✓ Discrete r.v
 - None of these
158. A random variable which can assume all possible values within a range is called as:
- ✓ Continuous random variable
 - Discrete random variable
 - Qualitative variable
 - Simple variable
159. A set containing no elements is called as:
- Power set
 - Union set
 - Prime no
 - Null set
160. A set is a well defined collection of distinct objects or values. A set is usually denoted by:
- Greek letter
 - ✓ Capital alphabets
 - Small alpha-bets
 - None of these
161. A variable having mean zero and variance 1 is:
- Discrete variable
 - Fix variable
 - Dependent variable
 - ✓ Standard normal variate
162. A variable whose values are determined by the outcomes of random experiment is called as:
- Qualitative variable
 - ✓ Random experiment
 - Random variable
 - Attributes
163. All odd order moments about means of a normal distribution are:
- Different
 - Positive
 - Negative
 - ✓ Zero
164. All the trials of binomial distribution are:
- ✓ Independent
 - Dependent
 - Continuous variable
 - None to zero
165. An arrangement of finite number of objects or items or individual in a definite order is:
- ✓ Combination
 - Permutation
 - Arrayed data
 - Arranged data in descending order
166. An arrangement of probabilities against each possible value of discrete random variable x is called as:
- Arrayed probabilities
 - ✓ Probability distribution
 - Distribution function
 - None of these
167. An arrangement of probabilities against each possible value of discrete random variable is:
- ✓ Probability mass function
 - Distribution function
 - Random experiment
 - Probability density function
168. Binomial distribution becomes normal distribution when 'n' number of trials are:
- Limited
 - Very small
 - ✓ Very large
 - None of these
169. Binomial experiment is repeated:
- Very large
 - ✓ A fix number of times
 - Unlimited time
 - None of these
170. $E(3X - 2) =$
- ✓ $3E(X) - 2$
 - $3E(X)$
 - $E(X) - 2$
 - $\Sigma xP(X)$
171. ${}^n C_n =$
- n
 - ✓ 1
 - $(n - 1)!$
 - $n!$
172. Normal curve is:
- Linear
 - Curvilinear
 - Parabola
 - ✓ Symmetrical
173. Normal distribution may also be called as:
- ✓ Meso kurtic distribution
 - Letpo kurtic distribution
 - Platy kurtic distribution

- (d) None of these
174. Number of ways a bridge-hand can select cards is:
 (a) ✓ ${}^{52}C_4$ (b) ${}^{52}C_{12}$
 (c) ${}^{52}C_1$ (d) ${}^{52}C_{13}$
175. $P(D \cap +)$ is best studied by:
 (a) Conditional probability
 (b) ✓ Baye's theorem
 (c) Multiplication law
 (d) Addition law
176. $P(-/\bar{D})$ is known as:
 (a) ✓ Specificity (b) Sensitivity
 (c) PPV (d) NPV
177. $P(A/B)$ is equal to:
 (a) $\frac{P(A \cap B)}{P(A)}$ (b) $P(A \cap B)$
 (c) $P(A), P(B)$ (d) $\frac{P(A \cap B)}{P(B)}$
178. Percentage area between $\mu - \sigma$ and $\mu + \sigma$ of normal distribution is:
 (a) 95.45% (b) 50%
 (c) ✓ 68.27% (d) 100%
179. Probability distribution of discrete random variable can also be called as:
 (a) Chance variable
 (b) Bi-variate distribution
 (c) ✓ Probability mass function
 (d) Random experiment
180. Probability of an event 'A' is always:
 (a) Negative (b) Zero
 (c) Positive (d) Greater than 1
181. Probability of event 'A' given that event 'B' already occurred is the:
 (a) Probability of B
 (b) Probability of (B/A)
 (c) ✓ Probability of (A/B)
 (d) None of these
182. Probability of sample space is equal to:
 (a) ✓ 1 (b) 0..
 (c) \emptyset (d) None of these
183. Range of probability of an event 'A' is:
 (a) From $-\infty$ to $+\infty$
 (b) ✓ From 0 to $+1$
 (c) From 0 to $+\infty$
184. Relative frequency definition of probability can also be named as:
 (a) ✓ Posteriori definition
 (b) Classical definition
 (c) Axiomatic definition
 (d) None of these
185. Sample space of 2 coins consists of:
 (a) ✓ 4 outcomes
 (b) 2 outcomes
 (c) 8 outcomes
 (d) 10 outcomes
186. Sample space of 3 coins consists of:
 (a) 4 outcomes
 (b) 3 outcomes
 (c) ✓ 8 outcomes
 (d) 10 outcomes
187. Sample space of 3 dice consists of:
 (a) 36 outcomes
 (b) 216 outcomes
 (c) 20 outcomes
 (d) None of these
188. Select the best statement concerning a normal (Gaussian) distribution:
 (a) The variance equals the standard deviation
 (b) The probability of randomly selecting a variable higher than two standard deviations
 (c) The probability of randomly selecting a variable higher than one standard deviation above the mean is 16%
 (d) ✓ The distribution is symmetric about each standard deviation
189. Statistical tests involving binomial distribution are used whenever the number of trials is:
 (a) Relatively large
 (b) ✓ Relatively small
 (c) Infinite
 (d) All above

Measure of Relationship

- Education and marital status of patients are best studied by:
 (a) ✓ Association

- (b) Proportion
(c) Percentages
(d) Correlation
2. Which of the following is unrelated to the measurement of association?
(a) Degree of freedom
(b) Significance level
(c) ✓ Life table
(d) Qualitative variable
3. The term 'regression' was firstly used by:
(a) Karl Pearson
(b) R A. Fisher
(c) ✓ Sir Francis Galton
(d) Dr. Bowley
4. For a regression line $Y - 8 = 2 + 3X$, then Y-intercept is:
(a) Slope of line
(b) ✓ 10
(c) 2
(d) 3
5. In simple linear regression the independent variable/variables is/are:
(a) None
(b) ✓ One
(c) Two
(d) Three
6. The variable to be estimated or predicted is called:
(a) Independent variable
(b) ✓ Dependent variable
(c) Dummy variable
(d) None of these,
7. The sum of errors or residuals must be:
(a) ✓ Zero
(b) Positive
(c) Negative
(d) Minimum
8. The sum of squares of residuals is made square method:
(a) Maximum
(b) Zero
(c) ✓ Minimum
(d) None of these
9. The graphic representation of n pairs of X, Y is:
(a) ✓ Scatter diagram
(b) Frequency distribution
(c) Histogram
(d) None of these
10. In simple linear regression the no. of parameters is:
(a) One
(b) ✓ Two
11. (c) Three
(d) Four
In regression, the independent variable is:
(a) ✓ Non-random
(b) Random
(c) Constant
(d) None of these
12. If a regression line passes through origin, the intercept is:
(a) ✓ Zero
(b) Positive
(c) Negative
(d) None of these
13. For a regression line $\hat{Y} = 10 + 2X$, intercept on Y-axis is:
(a) 5
(b) ✓ 10
(c) 15
(d) 20
14. For a regression line $\hat{Y} = 10 + 2X$, regression coefficient is:
(a) 1
(b) ✓ 2
(c) 3
(d) 4
15. The sum of deviations between actual values and expected values is always:
(a) Positive
(b) Negative
(c) ✓ Zero
(d) Unknown
16. Both the regression coefficients (b_{yx} , b_{xy}) must have signs:
(a) ✓ Same
(b) Opposite
(c) Positive
(d) Negative
17. For the simple linear regression model $Y = \alpha + \beta X + E$, where E represent:
(a) y-intercept
(b) x-intercept
(c) ✓ Random error
(d) None of these
18. The correlation coefficient 'r' lies between:
(a) ✓ -1 and +1
(b) 0 to 1
(c) -1 to 0
(d) $-\infty$ to $+\infty$
19. If the two random variables move in the same direction; correlation is said to be:
(a) Negative
(b) ✓ Positive
(c) Zero
(d) None of these
20. If the two random variables move in the opposite direction, correlation is said to be:
(a) Positive
(b) ✓ Negative
(c) Zero
(d) None of these

21. The correlation coefficient 'r' depends on the:
 (a) Unit of the data
 (b) Change of origin
 (c) Change of scale
 (d) ✓ None of these
22. If X is measured in inches (height) and Y is measured in kg (weight), the correlation coefficient will be:
 (a) In Kg (b) In inches
 (c) Inches/kg
 (d) ✓ Independent of scale
23. The correlation coefficient between X and Y and the correlation coefficient between Y and X are:
 (a) ✓ Same (b) Different
 (c) One (d) None of these
24. If $r_{xy} = 0.98$, then r_{yx} will be:
 (a) ✓ 0.98 (b) -0.98
 (c) 9.49 (d) None of these
25. If $r_{xy} = 0.98$ and $U = X - 3$, $V = -2Y$ then r_{uv} is:
 (a) ✓ 0.98 (b) -0.98
 (c) -0.49 (d) None of these
26. Suppose you are going to conduct a study "whether smoking is related to lung cancer", which one of the statistical tools you will use to find the answer:
 (a) Correlation coefficient
 (b) Measure of association
 (c) ✓ Odds ratio (d) Relative risk
27. If $b_{yx} = 0.98$ and $b_{xy} = 0.50$, then r_{xy} is:
 (a) 0.5 (b) 0.6
 (c) 0.7 (d) 0.9
28. If correlation coefficient $r = +1$ then there is:
 (a) ✓ Perfect positive correlation
 (b) Perfect negative correlation
 (c) Zero (d) None of these
29. The correlation coefficient is of the two regression coefficients:
 (a) Arithmetic mean
 (b) ✓ Geometric mean
 (c) Harmonic mean
30. (d) Median
 There is strong relationship between the variables if:
 (a) ✓ r is close to 1
 (b) r is close to zero
 (c) r is close to infinity
 (d) None of these
31. There is weak relationship between the variables if:
 (a) r is close to 1
 (b) ✓ r is close to zero
 (c) r is close to minus infinity
 (d) None of these
32. There is inverse relationship between the variables if:
 (a) r is +ve (b) ✓ r is -ve
 (c) r is zero (d) None of these
33. There is perfect positive relationship between the variables if:
 (a) $r = 0$ (b) $J = -1$
 (c) ✓ $r = +1$ (d) None of these
34. A characteristic which vary in quality is called:
 (a) Variable (b) ✓ Attribute
 (c) Frequency (d) None of these
35. A characteristic which vary in quantity is called:
 (a) ✓ Variable (b) Attribute
 (c) Frequency (d) None of these
36. The marital status of a man is an example of:
 (a) ✓ Attribute
 (b) Quantitative variable
 (c) Constant (d) None of these
37. Heights and weights of patients are best studied by:
 (a) Association
 (b) Proportion
 (c) Percentages
 (d) ✓ Correlation
38. The height and weight of a student is an example of:
 (a) Attribute
 (b) ✓ Quantitative variable
 (c) Constant (d) None of these
39. (A) represents the:

- (a) Attribute A
 (b) Sample size
 (c) ✓ Class frequency of attribute A
 (d) None of these
40. Two attributes A and B are independent if:
 (a) ✓ $(AB) = \frac{(A)(B)}{n}$
 (b) $(AB) > \frac{(A)(B)}{n}$
 (c) $(AB) < \frac{(A)(B)}{n}$
 (d) None of these
41. The two attributes A and B are positively associated if:
 (a) $(AB) \neq \frac{(A)(B)}{n}$
 (b) ✓ $(AB) > \frac{(A)(B)}{n}$
 (c) $(AB) < \frac{(A)(B)}{n}$
 (d) None of these
42. The coefficient of association, denoted by Q, is given by:
 (a) ✓ Karl Pearson
 (b) R.A. Fisher
 (c) Yule
 (d) Sir Francis Galton
43. The value of χ^2 statistic must be:
 (a) $\chi^2 > 0$ (b) $\chi^2 < 0$
 (c) ✓ $\chi^2 \geq 0$ (d) None of these
44. The χ^2 statistic for a test of independence:
 (a) $\chi^2 = \sum \left[\frac{(O'' - E'')^2}{E''} \right]$
 (b) $\chi^2 = \frac{\sum (O'' - E'')^2}{E''}$
 (c) $\chi^2 = \sum \sum \frac{\sum (O'' - E'')^2}{E''}$
 (d) $\chi^2 = \frac{\sum (O'' - E'')^2}{E''}$
45. The degree of freedom for test of independence in an $r \times c$ contingency

- table is:
 (a) $(r - 1)$
 (b) ✓ $(r - 1) \times (c - 1)$
 (c) $c - 1$
 (d) $(r - 1) + (c - 1)$
46. The degree of freedom for a 2×2 contingency table is:
 (a) ✓ One (b) Two
 (c) Three (d) Four
47. Yate's correction for continuity should be applied when a contingency table is:
 (a) 2×3 (b) ✓ 2×2
 (c) 2×4 (d) 4×2
48. Which of the following is the example of positive association between the variables?
 (a) The higher the socioeconomic status the lower the family size
 (b) The higher the education the lower the age at marriage
 (c) ✓ The more care the better health status
 (d) None of these
49. The null hypothesis of test for independence will be rejected if:
 (a) ✓ $\chi^2_{\text{cal}} > \chi^2_{\text{table}}$
 (b) $\chi^2_{\text{cal}} < \chi^2_{\text{table}}$
 (c) $\chi^2 = 0$ (d) None of these
50. The rejection of null hypothesis of test for independence means:
 (a) Attribute are independent
 (b) Attribute are not associated
 (c) ✓ Attribute are associated
 (d) None of these
51. The formula of rank correlation coefficient $r_s = 1 - \frac{6 \sum d^2}{n(n-1)}$ is given by:
 (a) Karl Pearson
 (b) Yule
 (c) ✓ Spearman
 (d) Sir Francis Galton
52. The coefficient of rank correlation lies between:

- (a) - to 0 (b) 0 to +1
 (c) ✓ - 1 to + 1 (d) - ∞ to + ∞
53. Select all of the following statements which you believe to be true. The Pearson correlation coefficient between two variables, x and y :
 (a) Is always positive
 (b) Is dimensionless
 (c) Has value between 0 & 1
 (d) ✓ Has value between - 1 & +1
54. How many dependent variables are used in multiple regression?
 (a) One (b) One or more
 (c) ✓ Two or more
 (d) Two
55. Let's suppose we are predicting score on a training posttest from number of years of education and the score on an aptitude test given before training. Here is the regression equation $Y = 25 + 5X_1 + 10X_2$, where X_1 = years of education and X_2 = aptitude test score. What is the predicted score for someone with 10 years of education and a aptitude test score of 5?
 (a) 25 (b) 50
 (c) 35 (d) ✓ 80
56. Select the following statements which you believe to be true. The slope of the linear regression line between an explanatory variable, x and a dependent variable, y , is:
 (a) ✓ The same as the gradient of the line
 (b) The value of Y when $x = 0$, where Y is the predicted value of Y
 (c) The average change in y for a unit increase in x
 (d) Always positive
57. Select the following relationships that are likely to be linear:
 (a) The relationship between age and the proportion of hairs on an individual's head which are grey
- (b) The relationship between age and height 'in individuals of all ages
 (c) ✓ The relationship between age and weight in children aged 5-11 years
 (d) The relationship between the quantity of alcohol consumed in an evening and a measurement of how straight a path an individual can walk along at the end of the evening
58. Select the following statements which you believe to be true. If the assumptions underlying a linear regression analysis are satisfied then we should find that:
 (a) The residuals are positive
 (b) ✓ The mean of the residuals is equal to zero
 (c) The variance of the residuals is equal to zero
 (d) The residuals are linearly related to the independent variable, x
59. A positive correlation is present when:
 (a) Two variables move in opposite directions
 (b) ✓ Two variables move in the same direction
 (c) One variable goes up and one goes down
 (d) Several variables never change
60. Which correlation is the strongest?
 (a) + .10 (b) - .95
 (c) + .90 (d) ✓ - 1.00
61. The correlation between intelligence test scores and grades is:
 (a) Positive (b) Negative
 (c) Perfect (d) ✓ Not clear
62. When interpreting a correlation coefficient expressing the relationship between two variables, it is very important to avoid:
 (a) Checking the strength of relationship

- (a) Both variables are continuous
 (b) ✓ All the expected frequencies are greater than 5
 (c) The sample is very large
 (d) Atleast one variable is from a normal distribution
76. True regarding Chi-square test:
 (a) ✓ No difference between observed and expected values
 (b) Does not test the significance
 (c) Tests correlation and regression
 (d) Measure the significance of difference between two proportions
77. The statistical analysis of two unrelated big data ($n = 200$) is by:
 (a) Paired Hest
 (b) Chi-square test
 (c) ✓ Z-test
 (d) Unpaired 't' – test
78. Formula for Chi-square value is:
 (a) $O - E/E$ (b) $\Sigma O - EE^2$
 (c) $(O - E)^2 / N$
 (d) ✓ $\Sigma (O - E)^2 / E$
79. When prevalence of disease increases then sensitivity:
 (a) Decreases (b) No change
 (c) ✓ Increases (d) All of above
80. Appropriate statistical method to compare risk:
 (a) ✓ Relative risk
 (b) Student's t-test
 (c) Chi-square test
 (d) Odds ratio
81. In a linear regression of y on x , $y = a + bx$:
 (a) Both variables have the same variance
 (b) A fitted straight line goes through $(0, 0)$
 (c) The variance of x is not constant for all values of y
 (d) ✓ x is the explanatory variable
82. When chi-square ($\chi^2 = 0$), then attributes are:
 (a) Highly associated
- (b) Correlated
 (c) ✓ Independent
 (d) Negatively associated
83. For case-control study, the best test to compare the data is:
 (a) Relative risk
 (b) Odds-ratio
 (c) t-test (d) ✓ None of these
84. Heights and weight of patients are best studied by:
 (a) Association
 (b) Proportion
 (c) Percentages
 (d) ✓ Correlation
85. Select the best statement concerning scatter plot:
 (a) It plots the distribution of potential confidence interval in the data set
 (b) It is a method to convert skewed data to normally distributed data in a data set
 (c) It provides a visual description of the distribution of potential sample mense drawn from a given population
 (d) ✓ It plots the values of two continuous variables in a data set
86. A physician wants to calculate a measure of linear association between two continuous variables. Which of the following should he use?
 (a) Simple linear regression
 (b) Multivariate analysis (MVA)
 (c) ✓ Pearson's correlation coefficient
 (d) Rank correlation coefficient
87. Given that the two regression coefficients are 1.06 and 0.47 then correlation coefficient is:
 (a) 0.98 (b) - 0.98
 (c) Zero
 (d) ✓ Wrong information
88. NOT required for the χ^2 statistic:
 (a) ✓ Mean & SD of data
 (b) Each expected is greater than 5

- (c) Large sample data set
 (d) Contingency table
89. For $r \times c$ contingency table, the degree of freedom is:
 (a) $\checkmark (r-1)(c-1)$
 (b) $(r+1)(c+1)$
 (c) $r+(c)$
 (d) $r-1 + (c-1)$
90. A study was conducted into the influence of spaying of bitches on their subsequent development of urinary incontinence. Young adult bitches presenting for spaying were randomly allocated to immediate ovariohysterectomy or a deferred operation 6 months later. The bitches were followed over the 6 months. What type of independent variable 'development' of urinary incontinence?
 (a) \checkmark Qualitative variable
 (b) Quantitative variable
 (c) Binary variable
 (d) Confounding variable
91. If the coefficient of determination is 49% then the correlation coefficient may:
 (a) 0.50
 (b) 0.60
 (c) 0.65
 (d) \checkmark 0.70
92. One method of finding relationship involving more than two variables is known as:
 (a) Simple correlation
 (b) Rank correlation
 (c) \checkmark Multiple correlation
 (d) None of these

Statistical Inferences & Analysis of Variance Anova

1. Test statistic used for testing the value of population proportion 'p' is:

$$(a) z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}} \quad (b) z = \frac{\hat{p} - p}{\sqrt{\frac{p^2 q^2}{n}}}$$

$$(c) t = \frac{\hat{p} - p}{\frac{pq}{n}} \quad (d) \checkmark z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}}$$

2. The value of population parameter within certain range is obtained by:
 (a) Sampling error
 (b) Point estimation
 (c) \checkmark Interval estimation
 (d) Sampling
3. To test $\mu_1 = \mu_2$ for paired observations test statistic is:
 (a) $t = \frac{\bar{d} - \mu_d}{\frac{\sigma}{\sqrt{n}}}$ (b) $z = \frac{\bar{d} - \mu_d}{\frac{s}{\sqrt{n}}}$
 (c) $\checkmark t = \frac{\bar{d} - \mu_d}{\frac{s_d}{\sqrt{n}}}$ (d) $t = \frac{(\bar{d} - p)}{\sqrt{\frac{pq}{n}}}$
4. To test that 1st population mean is at least 1 value more than that of 2nd population mean, H_0 and H_1 can be written as:
 (a) $H_0: \mu_1 - \mu_2 = 0, H_1: \mu_1 - \mu_2 \neq 0$
 (b) $\checkmark H_0: \mu_1 - \mu_2 \geq 1, H_1: \mu_1 - \mu_2 < 1$
 (c) $H_0: \mu_1 + \mu_2 \geq 0, H_1: \mu_1 - \mu_2 < 0$
 (d) None of these
5. To test that 1st population mean is superior to that of 2nd population mean, H_0 and H_1 will be:
 (a) $\checkmark H_0: \mu_1 > \mu_2, H_1: \mu_1 \leq \mu_2$
 (b) $H_0: \mu_1 < \mu, H_1: \mu_1 \geq \mu$
 (c) $H_0: \mu_1 \leq \mu_2, H_1: \mu_1 \geq \mu_2$
 (d) None of these
6. To test the 't' when 'a' is known we should use:
 (a) $z = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$ (b) $\checkmark z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$
 (c) $z = \frac{\bar{x} - \mu}{\delta}$ (d) $t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$
7. To test the equality of two population means when σ_1, σ_2 are not given for larger sample sizes, we should use:

- (a) $z = \frac{(x_1 - x_2) - (\mu_1 - \mu_2)}{\sqrt{n}}$
- (b) $\checkmark z = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\left(\frac{s_1^2}{n_1}\right) + \left(\frac{s_2^2}{n_2}\right)}}$
- (c) $z = \frac{(x_1 - x_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$
- (d) None of these
8. We are more confident about the range of population mean μ if we use:
 (a) 95% confidence coefficient
 (b) 99% confidence coefficient
 (c) \checkmark 99.73% confidence coefficient
 (d) 5% confidence coefficient
9. When ' σ ' is unknown and $n < 30$, test statistic used for testing ' μ ' is:
 (a) $\checkmark t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$ (b) $z = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$
 (c) $t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$ (d) None of these
10. When sampling is done with replacement to get point estimate of σ^2 , by $s^2 = \frac{\sum(x - \bar{x})^2}{n-1}$ and when $\Sigma s^2 p(s^2) = 7.5$ then the value of σ^2 is:
 (a) 56.25 (b) \checkmark 7.5
 (c) 10 (d) -56.25
11. Z-value is used to compute Col. for μ when:
 (a) s is used for $n \leq 30$
 (b) \checkmark σ is known
 (c) $s = \sqrt{\frac{\sum(x - \bar{x})^2}{n-1}}$ is used
 (d) None of these
12. For 95% confidence limits, true is:
 (a) Reduce 95% of values
 (b) \checkmark 1.96 of standard error of mean
 (c) 2.58 of standard error of
13. LSD stands for:
 (d) 5% of standard error of mean
14. If a 95% confidence interval of prevalence of TB infection in pediatrics age group is 24% to 37%. The chance that the prevalence less than 24% is:
 (a) 1 (b) 4%
 (c) \checkmark 2.5% (d) 5%
15. Select the correct statement:
 (a) The p-value is always calculated under the assumption that the null hypothesis is true
 (b) The p-value is a good estimate of how likely the null hypothesis is incorrect
 (c) The lower the p-value, the more likely the study results will benefit patients.
 (d) \checkmark The p-value is a good estimate of how likely the null hypothesis is correct
16. Standard error is measure of:
 (a) Conceptual error
 (b) Personal error
 (c) Observer's error
 (d) \checkmark Sampling error
17. Analysis of Variance (ANOVA):
 (a) \checkmark Splits up a total sum of squares
 (b) Is carried out on frequency data
 (c) Assumes a normal distribution of residuals
 (d) Helps to fit a line to a set of points on a graph
18. Another name of type-I error is:
 (a) Level of significance
 (b) \checkmark Alpha error
 (c) Beta error (d) p-value
19. When SD of a variable increase, the range of confidence interval for unknown population parameter:

- (a) Increases (b) ✓ Decreases
 (c) Remains same
 (d) No effect on limits
20. The Relative Risk (RR) = 1, indicates that the association between two factors is:
 (a) Perfect (b) High
 (c) Low (d) ✓ No
21. Mean of 400 values is 100 and SD = 80, what should be the standard error of estimate is:
 (a) 1 (b) ✓ 1
 (c) 2 (d) 0.40
22. Which distribution is the weight of doctors in a hospital likely to follow?
 (a) F-distribution
 (b) ✓ Normal distribution
 (c) Poisson distribution
 (d) Lognormal distribution.
23. A good hypothesis is that:
 (a) ✓ Which is testable
 (b) Based on subjective approach
 (c) Which would be easily rejected
 (d) Easily accepted
24. Mean of 100 values is 20 and SD = 8, what should be the standard error of estimate is:
 (a) 1 (b) 4
 (c) 2 (d) ✓ 0.80
25. Suppose data are normally distributed with a mean of 120 and a standard error of 30. Between what two values will approximately 68% of the data fall?
 (a) 60 and 180 (b) ✓ 90 and 150
 (c) 105 and 135
 (d) 140 and 170
26. $\frac{\sigma}{\sqrt{n}}$ indicates:
 (a) Standard error of proportion
 (b) Difference of means
 (c) Difference of proportion
 (d) ✓ Standard error of means
27. A clinical researcher wishes to test the hypothesis that the incidence of arthritis in females aged > 45 is 12%,
- the null hypothesis that the incidence is:
 (a) Different from 12%
 (b) ✓ Equal to 12%
 (c) Less than 12%
 (d) More than 12%
28. The range of F-ratio is:
 (a) $-\infty$ to ∞ (b) $-\infty$ to 0
 (c) -1 to $+1$ (d) ✓ 0 to ∞
29. ANOVA is applied for:
 (a) Two samples
 (b) ✓ More than two samples
 (c) Less than two samples
 (d) None of these
30. A good scheme for health is rejected by health department is an example of:
 (a) Correct decision
 (b) ✓ Type I-error
 (c) Type II-error
 (d) None of these
31. When the expected value of sample statistic is equal to population parameter, the property of estimator is called:
 (a) Sufficiency (b) ✓ Unbiasedness
 (c) Efficiency (d) Consistency
32. Results are statistically significant if the:
 (a) ✓ Null hypothesis is rejected
 (b) Alternative hypothesis is rejected
 (c) Null hypothesis is not rejected
 (d) Null hypothesis is true.
33. P-value becomes significant if it has value equal to or less than:
 (a) 5 (b) 0.5
 (c) ✓ 0.05 (d) 0.005
34. Which distribution is the cholesterol level in the general population likely to follow?
 (a) F-distribution
 (b) ✓ Normal distribution
 (c) Poisson distribution
 (d) None of these
35. Which distribution is the weekly

- number of car accidents on a stretch of road likely to follow?
- F-distribution
 - Normal distribution
 - Poisson distribution
 - Lognormal distribution
36. Width of confidence interval does not depend upon:
- Sample size
 - Population size
 - Variability of characteristic
 - Degree of confidence required
37. The large data set of two unrelated groups are best analyzed by ($n = 200$)
- Paired t-test
 - Chi-square test
 - F-test
 - Z-test
38. Discussion about population parameter on the basis of sample observations is:
- Sampling
 - Statistical inference
 - Point estimation
 - None of these
39. $\bar{x} = \frac{\Sigma x}{n}$ is:
- Estimator
 - Estimation
 - Parameter
 - Estimate
40. $\bar{x} = 5.9$ is:
- Interval estimate
 - Estimator
 - Estimate
 - None of these
41. If $E(\bar{x}) = \mu$ then \bar{x} will be:
- Sufficient
 - Consistent
 - Biased
 - Unbiased
42. Which distribution is a ratio of two variances likely to follow?
- F-distribution
 - Normal distribution
 - Poisson distribution
 - Lognormal distribution
43. As sample size 'n' approaches to ∞ the estimator would become:
- Biased estimator
 - Inefficient estimator
 - Consistent estimator
44. (d) None of these
In a group of 1000 individuals from a large population, 10% have brown eyes, the 10% is:
- Population parameter
 - Unbiased estimator
 - Point estimator
 - Efficient estimator
45. As a researcher you commit a type-I error if your are failed to:
- Reject the null hypothesis when it is true
 - Reject the null hypothesis when it is false
 - Accept the null hypothesis when it is true
 - None of these
46. All of the following are common characteristics of experimental research except:
- It relies primarily on the collection of numerical data
 - It can produce important knowledge about cause and effect
 - It uses the deductive scientific method
 - It rarely is conducted in a controlled setting or environment
47. Confidence limits for mean when population SD is known:
- Meant SD
 - Meant SE
 - Meant $Z_{\alpha/2}$ SE
 - None of them
48. The collection of all possible outcomes of an experiment is called:
- Events
 - Clinical trials
 - Clinical trails
 - Sample space
49. A good estimator has properties
- 1
 - 2
 - 3
 - 4
50. Mean and median are both _____ estimator of population mean:
- Biased
 - Consistent

51. (c)✓ Unbiased (d) Sufficient
 What does it mean when you calculate a 95% confidence interval?
 (a) The process you used will capture the true parameter 95% of the time in the long run
 (b)✓ You can be "95% confident" that your interval will include the population parameter
 (c) You can be "5% confident" that your interval will not include the population parameter
 (d) All of the above statements are true
52. What would happen (other things equal) to a confidence interval if you calculated a 99 percent confidence interval rather than a 95 percent confidence interval?
 (a) It will be narrower
 (b) It will not change
 (c) The sample size will increase
 (d)✓ It will become wider
53. Which of the following statements sounds like a null hypothesis?
 (a) The coin is not fair
 (b) There is a correlation in the population
 (c)✓ There is no difference between male and female incomes in the population
 (d) The defendant is guilty
54. The analysis of variance is a statistical test that is used to compare how many group means?
 (a) Three or more
 (b)✓ Two or more
 (d) Four or More
 (d) None of these
55. What is the standard deviation of a sampling distribution called?
 (a) Sampling error
 (b) Sample error
 (c)✓ Standard error
 (d) Simple error
56. Hypothesis testing and estimation are the two key branches of the field of inferential statistics?
 (a)✓ True (b) False
57. A _____ is a subset of a _____
 (a)✓ Sample – population
 (b) Population – sample
 (c) Statistic – parameter
 (d) Parameter – statistic
58. A _____ is a numerical characteristic of a sample and a - is a numerical characteristic of a population:
 (a) Sample – population
 (b) Population – sample
 (c)✓ Statistic – parameter
 (d) Parameter – statistic
59. A variable that is presumed/to cause a change in another variable is called a(n):
 (a) Categorical variable
 (b) Dependent variable
 (c)✓ Independent variable
 (d) Intervening variable
60. As a general rule, researchers tend to use _____ percent confidence intervals:
 (a) 99% (b)✓ 95%
 (c) 50%
 (d) None of the above
61. Which of the following is the researcher usually interested in supporting when he or she is engaging in hypothesis testing?
 (a) The alternative hypothesis
 (b) The null hypothesis
 (c)✓ Both the alternative and null hypothesis
 (d) Neither the alternative or null hypothesis
62. When $p < .05$ is reported in a journal article that you read for an observed relationship, it means that the author has rejected the null hypothesis (assuming that the author is using a significance or alpha level of .05):
 (a)✓ True (b) False
63. A condition or characteristic that can

- take on different values or categories is called:
- A constant
 - A variable
 - A cause-and-effect relationship
 - A descriptive relationship
64. _____ are the values that mark the boundaries of the confidence interval:
- Confidence intervals
 - Confidence limits
 - Levels of confidence
 - Margin of error
65. Which of the following best describes quantitative research?
- The collection of non-numerical data
 - An attempt to confirm the researcher's hypotheses
 - Research that is exploratory
 - Research that attempts to generate a new theory
66. A good way to get a small standard error is to use a _____
- Repeated sampling
 - Small sample
 - Large sample
 - Large population
67. The car will probably cost about 16,000 dollars; this number sounds more like a(n):
- Point estimate
 - Interval estimate
 - Both (a) & (b)
 - None of these
68. Identify which of the following steps would not be included in hypothesis testing:
- State the null and alternative hypotheses
 - Set the significance level before the research study
 - Eliminate all outliers
 - Obtain the probability value using a computer program such as SPSS
69. A _____ is a range of numbers inferred from the sample that has a certain probability of including the population parameter over the long run:
- Hypothesis
 - Lower limit
 - Confidence interval
 - Probability limit
70. _____ is the standard deviation of a sampling distribution:
- Standard error
 - Sample standard deviation
 - Replication error
 - Meta error
71. A Type I error is also known as a _____
- False positive
 - False negative
 - Double negative
 - Positive negative
72. A Type II error is also known as a _____
- False positive
 - False negative
 - Double negative
 - Positive negative
73. Which research paradigm is least concerned about generalizing its findings?
- Quantitative research
 - Qualitative research
 - Mixed research
 - None of the above
74. A post hoc test is _____
- A test to compare two or more means in one overall test
 - A test to determine regression to the mean
 - A follow-up test to the analysis of variance when there are three or more groups
 - A follow-up test to the independent t-test
75. The use of the laws of probability to make inferences and draw statistical conclusions about populations based on sample data is referred to as:
- Descriptive statistics

- (b) ✓ Inferential statistics
 (c) Sample statistics
 (d) Population statistics
76. A statistical test used to compare 2 or more group means is known as:
 (a) One-way analysis of variance
 (b) ✓ Post hoc test
 (c) Test for correlation coefficients
 (d) Simple regression
77. A statistical test used to determine whether a correlation coefficient is statistically significant is called the:
 (a) One-way analysis of variance
 (b) t-test for independent samples
 (c) Chi-square test for contingency tables
 (d) ✓ t-test for correlation coefficients
78. The "equals" sign (=) is included in which hypothesis when conducting hypothesis testing?
 (a) ✓ Null (b) Alternative
 (c) It can appear in both the null and the alternative hypothesis
 (d) None of these
79. As sample size goes up, what tends to happen to 95% confidence Intervals?
 (a) They become more precise
 (b) ✓ They become more narrow
 (c) They become wider
 (d) Both (a) and (b)
80. Which of the following statements is/are true according to the logic of hypothesis testing?
 (a) When the null hypothesis is true, it should be rejected
 (b) When the null hypothesis is true, it should not be rejected
 (c) When the null hypothesis is false, it should be rejected
 (d) ✓ Both (b) and (c) are true
81. $\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n}$, because \bar{x} uses all sample values, so \bar{x} will be:
 (a) Efficient estimator
 (b) ✓ Unbiased estimator
 (c) Bad estimator
82. (d) Sufficient estimator
 "It is likely to be rain today". There are 95% chances for the confirmation of this statement so the value of 'a' will be:
 (a) 0.95 (b) 0.99
 (c) .01 (d) ✓ 0.05
83. 95% C.I for p is:
 (a) $\hat{p} \pm Z_{\alpha/2} \sqrt{\frac{\hat{p}\hat{q}}{n}}$
 (b) $\hat{p} \pm t_{\alpha/2(n-2)} \sqrt{\frac{\hat{p}\hat{q}}{n}}$
 (c) $\hat{p} \pm 1.96 \sqrt{\frac{pq}{N}}$
 (d) ✓ $\hat{p} \pm \sqrt{\frac{\hat{p}\hat{q}}{n}}$
84. 99% C.I for μ have $\alpha =$
 (a) 0.5 (b) .001
 (c) .005 (d) ✓ .01
85. A criminal released from prison is the example of:
 (a) Sampling error
 (b) Type-I error
 (c) ✓ Type-II error
 (d) No error
86. A deserving candidate is failed in an interview is an example of:
 (a) Correct decision
 (b) Type-II error
 (c) ✓ Type-I error
 (d) Level of significance
87. A player can hit 70% of his shots H_0 and H_1 to test that his shooting proportion is improved is to test that his shooting proportion is improved is:
 (a) ✓ $H_0: p \leq 0.70$ $H_1: p > 0.70$
 (b) $H_0: p \geq 0.70$ $H_1: p < 0.70$
 (c) $H_0: p = 0.70$ $H_1: p \neq 0.70$
 (d) None of these
88. A sample consist of values 2, 4, 6, 8 which is taken from a normal population, the point estimate for μ is:
 (a) 2 (b) 3
 (c) 4 (d) ✓ 5

89. A sample has mean 50 and another sample has mean 40 then point estimate for $\mu_1 - \mu_2$ is:
 (a) ✓ 10 (b) 20
 (c) 30 (d) 40
90. A sample of 500 persons is taken from a population, if 200 are observed to have brown hair then point estimate for the proportion having brown hair is:
 (a) ✓ $\frac{2}{5}$ (b) 0.5
 (c) $\frac{2}{500}$ (d) .005
91. A statement about population parameter for possible rejection is:
 (a) Biased hypothesis
 (b) ✓ Null hypothesis
 (c) Alternate hypothesis
 (d) Correct hypothesis
92. Acceptance of false hypothesis is:
 (a) Type-II error
 (b) Type-I error
 (c) No error (d) Minute error
93. Acceptance of true hypothesis is:
 (a) α - error (b) β - error
 (c) ✓ Correct decision
 (d) Sampling error
94. Alternate hypothesis is usually denoted by:
 (a) H_0 (b) H'_1
 (c) H_A or H_1 (d) H'
95. For a two tailed confidence interval if $Z_{\alpha/2} = 1.645$ then $-Z_{\alpha/2}$ is:
 (a) 1.645 (b) ✓ -1.645
 (c) 1.96 (d) -1.96
96. For testing that difference in population means is significant, H_0 and H_1 will be:
 (a) ✓ $H_0: \mu_1 = \mu_2 \geq 0, H_1: \mu_1 \neq \mu_2$
 (b) $H_0: \mu_1 - \mu_2 \geq 0, H_1: \mu_1 - \mu_2 < 0$
 (c) $H_0: \mu_1 - \mu_2 \geq 0, H_1: \mu_1 - \mu_2 \geq 0$
 (d) None of these
97. H_0 and H_1 for testing that population means at least 5 is:
- (a) $H_0: \mu \leq 5, H_1: \mu > 5$
 (b) $H_0: \mu = 5, H_1: \mu < 5$
 (c) $H_0: \mu \geq 5, H_1: \mu = 5$
 (d) ✓ $H_0: \mu \geq 5, H_1: \mu < 5$
98. $H_0: \mu \geq 50$ is:
 (a) Simple hypothesis
 (b) ✓ Composite hypothesis
 (c) Accurate hypothesis
 (d) Alternate hypothesis
99. $H_0: \mu = \mu_0$ is:
 (a) Composite hypothesis
 (b) Alternate hypothesis
 (c) Complex hypothesis
 (d) ✓ Simple hypothesis
100. If $\bar{x} = 5, \mu = 5.5$ then sampling error will be:
 (a) -1 (b) ✓ -0.5
 (c) Zero (d) 1.5
101. If $\bar{x} = 30, n = 100, \Sigma(x - \bar{x})^2 = 6400, Z_{\alpha/2} = \pm 1.65$ then C.I for μ will be:
 (a) ✓ 28.68, 31.32
 (b) 27.72, 30.42
 (c) 29, 35 (d) 30, 40
102. If $\bar{x} = 50, n = 100, s = 10$ then 95% Col. for I-l will be:
 (a) 40.2, 55.7 (b) 49, 53
 (c) 48.96, 53.96
 (d) ✓ 48.04, 51.96
103. If $\alpha = .05, \frac{\alpha}{2}$ area lies on extreme right tail and $\frac{\alpha}{2}$ area lies on extreme left tail, such test will be:
 (a) ✓ Two tail test
 (b) One tail test
 (c) Simple test
 (d) Complex test
104. If $\alpha = 1\%$, the confidence coefficient to calculate population parameter ' μ ' is:
 (a) .01 % (b) ✓ 99%
 (c) 5% (d) 1 %
105. If ' σ ' is given for testing the value of ' μ ' then use always:
 (a) x^2 - test (b) ✓ z-test

- (c) t-test (d) F-test
106. If ' σ ' is not known then z-test will be applied when:
 (a) $n \geq 30$ (b) $n < 30$
 (c) $1 \leq n \leq 30$ (d) $\alpha > .05$
107. If ' α ' lies only on extreme right tail of distribution, such test will be:
 (a) Two tail test
 (b) One tail test
 (c) Normal test
 (d) x_2 -test
108. If confidence coefficient is 98% to compute the confidence interval for ' μ ' then level of significance used is:
 (a) ✓ 2% (b) 0.98%
 (c) 98% (d) 5%
109. If $E(\bar{x}) = \mu$ then bias is:
 (a) ✓ Zero (b) 100%
 (c) 50% (d) 0.5
110. If $E(\bar{x}) = 5$ and $\mu = 5$ then bias is:
 (a) 0.5 (b) ✓ Zero
 (c) -ve (d) 1.5
111. If expected value of an estimator s^2 is 2.0 and value of population parameter σ is 1.8 then bias is:
 (a) 1.5 (b) 0.2
 (c) 0.8 (d) Zero
112. If H_0 is rejected at $\alpha = .05$ and at $\alpha = .01$ the result will be:
 (a) Insignificant
 (b) Highly significant
 (c) Accepted (d) Confirmed
113. If population standard deviation is not given then use of z-test will depend on:
 (a) Sample size
 (b) Sample mean
 (c) Sample variance
 (d) S.E.
114. If population variance σ^2 is not given, then use of t-test depends on:
 (a) α (b) ✓ n
 (c) β (d) $1 - \beta$
115. If T is an unbiased estimator of population parameter 0 then $E(T) - 0$ will be:
- (a) 0 (b) T
 (c) ✓ Zero (d) 1
116. If $\text{var}(T_1) = 0.5911$ and $\text{var}(T_2) = 0.6820$ where T_1 and T_2 are unbiased estimators of a population parameter '0' then ' T_1 ' will be more:
 (a) Consistent (b) ✓ Efficient
 (c) Sufficient (d) Biased
117. If we want to test that population mean ' μ ' is equal to 50, the null Hyp. And alternate Hyp. Can be written as:
 (a) $H_0: \mu = 50, H_1: \mu < 50$
 (b) $H_0: \mu \geq 50, H_1: \mu < 50$
 (c) $H_0: \mu = 50, H_1: \mu \neq 50$
 (d) ✓ $H_0: \mu = 50, H_1: \mu \geq 50$
118. If we want to test that population mean ' μ ' is greater than 100, then H_0 & H_1 will be:
 (a) ✓ $H_0: \mu \geq 100, H_1: \mu < 100$
 (b) $H_0: \mu \leq 100, H_1: \mu > 100$
 (c) $H_0: \mu = 100, H_1: \mu > 100$
 (d) None of these
119. It is claimed that average quantity of water in cold drink bottle is 250ml. Statement of H_0 and H_1 to test this claim is:
 (a) $H_0: \mu \leq 250, H_1: \mu > 250$
 (b) $H_0: \mu = 250, H_1: \mu \neq 250$
 (c) $H_0: \mu \geq 250, H_1: \mu < 250$
 (d) ✓ $H_0: \mu = 250, H_1: \mu \neq 250$
120. Marks obtained by 10 students in a test is 1st set of values and marks obtained by same 10 students in another test of same difficulty after their special coaching is the 211d s. of values. Such type of data is:
 (a) ✓ Paired data (b) Pooled data
 (c) Independent data
 (d) Discrete data
121. Null hypothesis is usually denoted by:
 (a) ✓ H_0 (b) H_1
 (c) H_A (d) H'
122. Power of a test is:
 (a) $1 - \alpha$ (b) α

- (c) β (d) $\sqrt{1 - \beta}$
123. Probability of accepting a true H_0 is:
 (a) Interval estimation
 (b) Estimation
 (c) ✓ Level of confidence
 (d) Level of significance
124. Probability of making Type-I error is:
 (a) Confidence interval
 (b) Confidence-coefficient
 (c) ✓ Level of significance
 (d) Level of confidence
125. Region of rejection for H_0 is:
 (a) Acceptance region
 (b) ✓ Critical region
 (c) Wider region
 (d) Shortest region
126. Rejection of true H_0 is:
 (a) Type-I error
 (b) Type-II error
 (c) ✓ Correct decision
 (d) None of these
127. Rejection of false H_0 is:
 (a) Type-I error
 (b) type-II error
 (c) Type-III error
 (d) ✓ Correct decision
128. Risk of H_0 is:
 (a) β -error (b) ✓ α -error
 (c) γ -error (d) λ -error
129. Single value of population parameter is obtained by:
 (a) ✓ Point estimation
 (b) Interval estimation
 (c) Testing of hypothesis
 (d) Sampling
130. Statistical inference has two types:
 (a) Point estimation and interval estimation
 (b) ✓ Estimation and testing of hypothesis
 (c) Point estimate and interval estimate
 (d) Point estimator and interval estimator
-

Research Methods

1. More precise measurement scale is:
 (a) Nominal (b) ✓ Ratio
 (c) Ordinal (d) Interval
2. Most feasible sources of data collection are:
 (a) Hospital records
 (b) Health centre records
 (c) HMIS
 (d) ✓ Government reports
3. Most important component of planning cycle is:
 (a) Identification of problem
 (b) Priority setting
 (c) Plan solutions
 (d) ✓ Implementation
4. Odds ratio can be calculated by:
 (a) Cross sectional study
 (b) Descriptive study
 (c) ✓ Case control study
 (d) Cohort study
5. One of the following statements about cross sectional surveys is not true:
 (a) It tells us about prevalence of disease
 (b) It tell us about geographical distribution
 (c) Determinants of disease can be hypothesized
 (d) ✓ In tell us about incidence of disease
6. One of the main disadvantages of case control study is:
 (a) It is expensive
 (b) Requires longer time period
 (c) Required large number of subject
 (d) ✓ Does not determine the relative risk
7. One step that is not included in planning a research study is:
 (a) Identifying a researchable problem
 (b) A review of current research
 (c) Statement of the research question

- (d)✓ Conducting a meta-analysis of the research
8. Plagiarism refers to which of the following?
 (a) Copying verbatim and without citing the source
 (b) Stealing the intellectual property of someone else without citing the source
 (c) Using the example from another paper but mixing up the order so it is unrecognizable
 (d)✓ All of the above
9. Process of randomization is useful to eliminate:
 (a)✓ Observer bias
 (b) Patient bias
 (c) External variation
 (d) None of these
10. Relative risk can be calculated in:
 (a)✓ Cohort study
 (b) Case control study
 (c) Cross sectional study
 (d) Descriptive study
11. Reliability of a test DOES NOT imply:
 (a) Reproducibility
 (b)✓ Validity
 (c) Consistency
 (d) Repeatability
12. Research hypotheses are:
 (a) Formulated prior to a review of the literature
 (b) Statements of predicted relationships between variables
 (c) Stated such that they can be confirmed or refuted
 (d)✓ (b) and (c)
13. Sample surveys are:
 (a) True experimental study
 (b) Ex-post facto study
 (c)✓ Cross-sectional study
 (d) None of these
14. Past events are best studied by:
 (a)✓ Ex-post facto studies
 (b) Cross sectional studies
- (c) True experimental studies
 (d) None of these
15. Screening is:
 (a) Expensive (b) Inaccurate
 (c) Reliable
 (d)✓ Tells us only about susceptible individuals
16. Sources of researchable problems can include:
 (a) Researchers' own experiences as educators
 (b) Practical issues that require solutions
 (c) Theory and past research
 (d)✓ All of the above
17. The "equals" sign (=) is included in which hypothesis when conducting hypothesis testing?
 (a)✓ Null (b) Alternative
 (c) It can appear in both the null and the alternative hypothesis
 (d) None of these
18. In modern medical research, hypothesis is:
 (a)✓ Not necessary
 (b) Necessary
 (c) May be or may be not
 (d) All above
19. The ability of a test to correctly identifies those who truly have the disease is known as:
 (a) Validity
 (b) Positive predictive value
 (c) Negative predictive value
 (d)✓ Sensitivity
20. The basic measure of disease occurrence, which express the probability of risk is:
 (a)✓ Rate (b) Ratio
 (c) Proportion (d) Numerator
21. The best epidemiological study to provide evidence of association in retrospective data is:
 (a) Cross sectional surveys
 (b)✓ Case control studies
 (c) Cohort studies

22. (d) Randomized control trials
 The best quality which a research worker must posses are:
 (a) Adventure seeking
 (b) Patience
 (c) Receptivity to criticism
 (d)✓ Objectivity
23. The car will probably cost about 16,000 dollars; this number sounds more like a(n):
 (a)✓ Point estimate
 (b) Interval estimate
 (c) (a) & (b) (d) None of these
24. The component of health research triangle which is missing in Pakistan is:
 (a) Biomedical research
 (b) Behavioural research
 (c) Developmental research
 (d)✓ Basic research
25. The feasibility of a research study should be considered in light of:
 (a) Cost and time required to conduct the study
 (b) Skills required of the researcher
 (c) Potential ethical concerns
 (d)✓ All of the above
26. The group that does not receive the experimental treatment condition is the:
 (a) Experimental group
 (b)✓ Control group
 (c) Treatment group
 (d) Independent group
27. The group that receives the experimental treatment condition is the
 (a)✓ Experimental group
 (b) Control group
 (c) Participant group
 (d) Independent group
28. The historically first international guideline pertaining to research involving human participants was the:
 (a)✓ Declaration of Helsinki
 (b) Declaration of Japan
- (c) Nuremberg Code
 (d) None of these
29. The incidence of diabetes in Lahore is very high. All those residents who do not have diabetes in Lahore followed for 5 years and risk factors in developing diabetes are identified, under which study would you classify it?
 (a) Retrospective study
 (b) Cross sectional study
 (c) Experimental study
 (d)✓ Prospective study
30. The Introduction section of the research plan:
 (a) Gives an over view of prior relevant studies
 (b) Contains a statement of the purpose of the study
 (c) Concludes with a statement of the research questions and, for quantitative research, it includes the research hypothesis
 (d)✓ All of the above
31. The median estimated from a sample:
 (a) Is always equal to an actual observation
 (b) Is close to the mean if the distribution is symmetrical
 (c) Is less than the mean if the distribution is positively skewed
 (d)✓ Is greater than or equal to at least 50% of the observations
32. The Method section of the research plan typically specifies:
 (a) The research participants
 (b) The results of prior studies that redress the phenomena of interest
 (c) The apparatus, instruments and materials for the research study
 (d) The planned research procedure
 (e)✓ (a), (c) and (d)
33. The number of police officers and the number of crimes are positively related. This relationship is:

- (a) A causal relationship
 (b) A direct relationship
 (c) A probabilistic causal relation
 (d) ✓ A spurious relationship
34. The Pearson product moment correlation measures the degree of relationship present between two variables:
 (a) Curvilinear
 (b) Nonlinear
 (c) Linear and quadratic
 (d) ✓ Linear
35. The positive association between psychologists and the number of mental patients is:
 (a) Spurious
 (b) Due to a third-variable
 (c) No spurious
 (d) ✓ (a) and (b)
36. The proportion of true negatives among all those who truly do not have disease is known as:
 (a) Validity (b) Sensitivity
 (c) ✓ Specificity
 (d) Positive predictive value
37. The purpose of double blinding in clinical trials is to:
 (a) Achieve comparability between study and control groups
 (b) Avoid observer bias
 (c) Avoid subject bias
 (d) ✓ Avoid observer and subject bias
38. The relationship between incidence & prevalence of disease can be calculated by:
 (a) $I = P \times D$ (b) $D = I \times P$
 (c) $D = P / I$ (d) ✓ $P = I \times D$
39. The research participants are described in detail in which section of the research plan?
 (a) Introduction
 (b) ✓ Method
 (c) Data analysis
 (d) Discussion
40. The scale of measurement that has relative zero in its measure is:
- (a) Ratio scale (b) ✓ Interval scale
 (c) Ordinal scale
 (d) Nominal scale
41. The scale of measurement that necessarily has absolute zero in its measure is:
 (a) Ratio scale (b) ✓ Interval scale
 (c) Ordinal scale
 (d) Nominal scale
42. The scale of measurement that necessary order in its measure is:
 (a) Ratio scale (b) Interval scale
 (c) ✓ Ordinal scale
 (d) Nominal scale
43. The statement of purpose in a research study should:
 (a) Identify the design of the study
 (b) Identify the, intent or objective of the study
 (c) Specify the type of people to be used in the study
 (d) ✓ Describe the study
44. The ultimate goal of experimental study is:
 (a) To measure variation
 (b) ✓ To determine the cause-effect relationship
 (c) To locate the central value
 (d) To determine the most prevalent value
45. The variable the researcher matches to eliminate it as an alternative explanation is called a(n) _____ variable:
 (a) ✓ Matching (b) Independent
 (c) Dependent (d) Partial
46. There are a number of ways in which confounding extraneous variables can be controlled, which control technique is considered to be the best?
 (a) ✓ Random assignment
 (b) Matching
 (c) Counterbalancing
 (d) None of the above
47. This is the difference between a sample statistic and the corresponding population parameter:

- (a) Standard error
 (b) ✓ Sampling error
 (c) Difference error
 (d) None of the above
48. This type of design is one where all participants participate in all experimental treatment conditions:
 (a) Factorial design
 (b) Repeat measures design
 (c) Replicated design
 (d) ✓ Pretest-posttest control-group design
49. This type of longitudinal research studies the same individuals over an extended period of time:
 (a) Trend study (b) Panel study
 (c) ✓ Both (a) and (b)
 (d) None of these
50. To carry out an effective plan, more emphasis should be given on:
 (a) Monitoring (b) Evaluation
 (c) ✓ Implementation
 (d) Resource development
51. To find the incidence rate you need:
 (a) Retrospective study
 (b) ✓ Prospective study
 (c) Cross sectional study
 (d) Experimental study
52. To measure disease burden in a community which of the following is essential to know:
 (a) Incidence
 (b) Period prevalence
 (c) Point prevalence
 (d) ✓ Incidence rate
53. To measure relative risk (RR) one needs:
 (a) Retrospective study
 (b) Cross-section study
 (c) ✓ Prospective study
 (d) Experimental study
54. To promote health system research in Pakistan following strategy should be adopted:
 (a) Increase financial assistance
 (b) Organization & management of research cell
 (c) ✓ Legislation & policy making
 (d) Inter & intra sectoral coordination
55. To suspect an association between a disease & some factor, the type of study should be:
 (a) Cohort study
 (b) Cross-sectional study
 (c) ✓ Case-control study
 (d) Descriptive study
56. What is another term that refers to a confounding extraneous variable?
 (a) Last variable
 (b) First variable
 (c) ✓ Third variable
 (d) Fourth variable
57. What kind of ideas can't be empirically researched?
 (a) Effectiveness of different methods of instruction
 (b) Description of educational practices
 (c) ✓ Issues of values and morality such as the correctness of having prayer in schools
 (d) Factors helpful in predicting future drug use
58. When a citation includes more than authors, only the surname of the first author is cited followed by et al.
 (a) 3 (b) 4
 (c) 5 (d) ✓ 6
59. When a extraneous variable systematically varies with the independent variable and influences the dependent variable, it is called:
 (a) Another dependent variable
 (b) ✓ A confounding variable
 (c) A moderating variable
 (d) An unreliable variable
60. When a researcher starts with the dependent variable and moves backwards, it is called:
 (a) Predictive research
 (b) Retrospective research
 (c) Exploratory research
 (d) Descriptive research
61. When all participants receive all treatment conditions, the study is susceptible to:
 (a) Order effects

- (b)✓ Carryover effects
 (c) Analysis of covariance
 (d) (a) and (b)
62. When an instrument/test gives the same reading every time in the same conditions, it is:
 (a) Sensitive (b) Accurate
 (c) Valid (d)✓ Reliable
63. When research is done to test hypotheses and theories about how and why phenomena operate as they do, then the primary purpose of such research is:
 (a) Descriptive
 (b) Predictive
 (c)✓ Explanatory
 (d) Causal
64. Which approach is the strongest for establishing that a relationship is causal?
 (a) Causal-comparative
 (b)✓ Correlational
 (c) Experimental
 (d) Historical
65. Which is suitable study design, when patients take both treatment and placebo?
 (a) Randomized controlled trial
 (b) Double blind trial
 (c) Single blind trial
 (d) Cross over trials
66. Which of the following could be used for randomly assigning, participants to groups in an experimental study?
 (a) Split-half (e.g., first half versus second half of a school directory)
 (b) Even versus odd numbers
 (c)✓ Use a list of random numbers or a computer randomization program
 (d) Let the researcher decide which group will be the best
67. Which of the following independent variables cannot be manipulated in a research study?
 (a) Gender (b) Ethnicity
 (c) Intelligence and other traits
 (d)✓ None of the above can be manipulated in a research study
68. Which of the following is not database containing information to be used during the literature review?
 (a) ERIC (b) PsychINFO
 (c) SocioFILE
 (d)✓ All of the above are potentially useful data bases
69. Which of the following is not a feature of retrospective study design?
 (a) Cost effective
 (b) Quick results
 (c)✓ Requires follow up of subjects
 (d) Proceeds from effect to cause
70. Which of the following is NOT a form of longitudinal research?
 (a) Trend study (b) Panel study
 (c) Cross-sectional study
 (d) Prospective
71. Which of the following is NOT a method to control the Bias in experimental study?
 (a)✓ Ethical consideration
 (b) Matching
 (c) Randomization
 (d) Blinding
72. Which of the following is not an example of randomized control design?
 (a) Two stage design
 (b) Factorial design
 (c)✓ One arm design
 (d) Cross over design
73. Which of the following statements, sounds like a null hypothesis?
 (a) The coin is not fair
 (b) There is a correlation in the population
 (c)✓ There is no difference between male and female incomes in the population
 (d) The defendant is guilty
74. Which one of the following is not a step in non-experimental research?
 (a) Determine research problem and hypotheses
 (b) Analyze data
 (c) Interpret results
 (d)✓ Randomization

75. Who gives consent in cases of minors who have no parents or guardians?
- Consent can be waived, as it is not necessary
 - Nobody
 - A social worker
 - Legal guardians
76. Secondary/existing data may include which of the following?
- Official documents
 - Personal documents
 - Archived research data
 - All of the above
77. Which of the following terms best describes data that were originally collected at an earlier time by a different person for a different purpose?
- Primary data
 - Secondary data
 - Experimental data
 - Field notes
78. A census taker often collects data through which of the following?
- Standardized tests
 - Interviews
 - Secondary data
 - Observations
79. The researcher has secretly placed him or herself (as a member) in the group that is being studied. This researcher may be which of the following?
- A complete participant
 - An observer-as-participant
 - A participant-as-observer
 - None of the above
80. Which of the following is not a major method of data collection?
- Questionnaires
 - Observations
 - Correlational method
 - Secondary data
81. Open-ended questions provide primarily _____ data:
- Confirmatory data
 - Qualitative data
 - Predictive data
 - None of the above
82. Which of the following is not one of the six major methods of data collection that are used by educational researchers?
- Observation
 - Interviews
 - Questionnaires
 - Checklists
83. Which one of the following is not a major method of data collection:
- Questionnaires
 - Interviews
 - Secondary data
 - Observations
 - All of the above are methods of data collection
84. Select the following statements which you believe to be true:
- A sample statistic is a point estimate of a population parameter
 - Sampling error arises when we transcribe data incorrectly
 - Random sampling implies a haphazard approach to the data analysis
 - For a given data set, the standard deviation is always less than the standard error of the mean
85. Which type of research provides the strongest evidence about the existence of cause-and-effect relationships?
- Non-experimental Research
 - Experimental Research
 - (a) & (b)
 - None of these
86. What is the key defining characteristic of experimental research?
- Extraneous variables are never present
 - A positive correlation usually exists
 - A negative correlation usually exists
 - Manipulation of the independent variable
87. In _____, random assignment to groups is never possible and the researcher cannot manipulate the

- independent variable:
- Basic research
 - Quantitative research
 - Experimental research
 - Causal-comparative and correlational research
88. What is the defining characteristic of experimental research?
- Resistance to manipulation
 - Manipulation of the independent variable
 - The use of open-ended questions
 - Focuses only on local problems
89. Research that is done to understand an event from the past is known as:
- Experimental research
 - Historical research
 - Replication
 - Archival research
90. _____ research occurs when the researcher manipulates the independent variable:
- Causal-comparative research
 - Experimental research
 - Ethnography
 - Correlational research
91. Which of the following includes examples of quantitative variables?
- Age temperature, income, height
 - Grade point average, anxiety level, reading performance
 - Gender, religion, ethnic group
 - (a) and (b)
92. What is the opposite of a variable?
- A constant
 - An extraneous variable
 - A dependent variable
 - A data set
93. Which of the following is the type of non-experimental research in which the primary independent variable of interest is categorical?
- Causal-comparative research
 - Experimental research
 - Qualitative research
 - Mixed research
94. Which of the following can best be described as a categorical variable?
- Age
 - Annual income
 - Grade point average
 - Religion
95. In research, something that does, not "vary" is called a _____
- Variable
 - Method
 - Constant
 - Control group
96. The strongest evidence for causality comes from which of the following research methods?
- Experimental
 - Causal-comparative
 - Correlational
 - Ethnography
97. When referencing other works you have cited within the text of the report you should:
- State the first and last name of the author
 - Use the author, date citation method
 - Use an asterisk and a footnote
 - Insert the complete citation in parenthesis
98. The factor that should determine whether you decide to prepare a research report of your study for a conference or for publication is:
- Whether the study is free from flaws
 - Whether the study is important enough to justify presentation or publication
 - Whether others would be interested in the work
 - All of the above
99. Which of the following is **not** one of the seven major parts to the research report?
- Results
 - Abstract
 - Method
 - Footnotes
100. The abstract should be about how many words?
- 100
 - 110
 - 120
 - 130
101. The Method section should start on a separate page in a manuscript:

- (a)✓ True (b) False
 102. It is in this section that you fully interpret and evaluate your results:
 (a) Introduction
 (b) Method
 (c) Results (d)✓ Discussion
103. Where do you provide a step-by-step account of what the researcher and participants did during the research study?
 (a) Introduction
 (b) Abstract
 (c)✓ Procedure (d) Design
104. A qualitative research question:
 (a) Asks a question about some process, or phenomenon to be explored
 (b) Is generally an open-ended question
 (c)✓ (a) and (b) are correct
 (d) None of the above
105. The research participants are described in detail in which section of the research plan?
 (a) Introduction
 (b) Method
 (c) Data analysis
 (d) Discussion
106. A research plan:
 (a) Should be detailed
 (b) Should be given to others for review and comments
 (c) Sets out the rationale for a research study
 (d)✓ All of the above
107. The Method section of the research plan typically specifies:
 (a) The research participants
 (b) The results of prior studies that address the phenomena of interest
 (c) The apparatus, instruments, and materials for the research study
 (d) The planned research procedures
 (e)✓ (a), (c) and (d)
108. Which is the best measure for strength of association between exposure and outcome of interest?
- (a). RR
 (b) Attributable risk
 (c)✓ QR (d) Incidence rate
 109. Incidence of diarrhea in community is best studied by:
 (a) Case-control study
 (b) Cross-sectional
 (c) Single blind study.
 (d) Cohort study
110. In Cohort study, one is irrelevant:
 (a)✓ Proceeds from "effect to cause"
 (b) Starts with people exposed to risk factor
 (c) Yields incidence rate
 (d) Time consuming'
111. A group of people who share a common characteristics or experience within a defined period of time known as:
 (a) Case (b) Control
 (c)✓ Cohort (d) All of above
112. Systematic error in calculation of association between factor and outcome is known as:
 (a)✓ Bias (b) Chance
 (c) Type one error
 (d) Confounding
113. While formulating "research methodology" the most important task is:
 (a) Defining variable
 (b) Study design
 (c) Data collection
 (d)✓ (a) and (b)
114. A researcher investigated the relationship between vitamin C (none, 500mg, 100mg) and worker (office, outdoors) in term of frequency of cold which of the following is the dependent variable:
 (a)✓ Cold (b) Vitamin C
 (c) Cold and worker
 (d) Vitamin C and worker
115. Which is the inferential statistic?
 (a) Mode
 (b) Standard deviation
 (c)✓ t-test (d) Range
116. The t-test is used to:
 (a) Adjust for initial difference

- within the groups
- (b) Estimate the error of prediction
 - (c) Test whether two Groups differ
 - (d) Test whether more than two groups differ significantly
117. Reliability coefficient greater than - is considered as high consistency in measurement scale:
- (a) 0.50 (b) 0.60
 - (c) 0.70 (d) ✓ 0.80
118. Harvard and Vancouver are two major style of:
- (a) Indexing (b) Documenting
 - (c) Report writing
 - (d) ✓ Referencing
119. Alternative methods to scientific research are:
- (a) Tradition
 - (b) Expert opinion
 - (c) Experience
 - (d) Logical reasoning
 - (e) ✓ All of above
120. The important characteristics of scientific research are:
- (a) Systematization
 - (b) Order
 - (c) Empiricism
 - (d) Generalization
 - (e) ✓ All of above
121. Incidence rate of a disease refer to:
- (a) Old case (b) ✓ New cases
 - (c) Existing cases
 - (d) Both old and new cases
122. Inferences of research are well accepted if there is:
- (a) Deductive reasoning
 - (b) Inductive reasoning
 - (c) ✓ Maintenance of probability
 - (d) Hypothesis are carefully constructed
123. Informed consent is important because:
- (a) It enables the participant to understand vital information on the proposed trial
 - (b) ✓ It provides the participant with all the information regarding remote risks
 - (c) It enables the investigator to recruit participants of his choice
 - (d) It promotes clinical research
124. Informed consent refers to:
- (a) Principle of autonomy
 - (b) Voluntary but uninformed decision-making
 - (c) A voluntary decision to participate in research, by a competent individual who has received and understood the necessary information
 - (d) ✓ Permission to participate in research
125. Longitudinal studies:
- (a) Are economical
 - (b) Are used to calculate OR
 - (c) Are good for studying single outcome
 - (d) ✓ Can provide incidence of disease
126. Retrospective studies are NOT to use because:
- (a) Are economical
 - (b) ✓ Provide incidence of disease
 - (c) Are good for studying single outcome
 - (d) Are easy to conduct
127. Major objective of literature review in research is:
- (a) Identification of topic
 - (b) ✓ Avoid duplication
 - (c) Facilitation of full understanding of subject
 - (d) Keeping updates with new development
-

Meaning and Characteristics of Statistics

1. In the plural sense, statistics mean:
 - (a) Methods
 - (b) ✓ Numerical Data
 - (c) Sample values
 - (d) Population values
2. In the singular sense, statistics means:
 - (a) ✓ Methodology
 - (b) Numerical data
 - (c) Sample values
 - (d) Count data
3. Data used by an agency which originally collected them are:
 - (a) ✓ Primary data
 - (b) Raw data
 - (c) Secondary data
 - (d) Grouped data
4. The word statistics is at present used in:
 - (a) Two senses (b) ✓ Three senses
 - (c) Four senses (d) None of these
5. Data in the Population Census Reports are:
 - (a) Ungrouped data
 - (b) Secondary data
 - (c) ✓ Primary data
 - (d) Arrayed data
6. Measurements usually provide:
 - (a) Discrete data
 - (b) ✓ Continuous data
 - (c) Qualitative data
 - (d) Primary data
7. Counting or enumerations usually provide:
 - (a) Continuous data
 - (b) Qualitative data
 - (c) ✓ Discrete data
 - (d) Grouped data
8. Hourly temperature recorded by Weather Bureau represents:
 - (a) Discrete data
 - (b) ✓ Continuous data
 - (c) Qualitative data
 - (d) Secondary data
9. Number of accidents recorded yesterday in Lahore is a:
 - (a) ✓ Discrete variable
 - (b) Continuous variable
 - (c) Qualitative variable
 - (d) Constant
10. The amount of milk given by a cow is a:
 - (a) Qualitative variable
 - (b) Discrete variable
 - (c) ✓ Continuous variable
 - (d) Constant
11. Colour of hair is a:
 - (a) Continuous variable
 - (b) Discrete variable
 - (c) ✓ Qualitative variable
 - (d) Quantitative variable
12. Smoking habits of residents of a city are:
 - (a) ✓ Qualitative data
 - (b) Quantitative data
 - (c) Discrete data
 - (d) Continuous data
13. Major area of statistics today is concerned with drawing conclusions from:
 - (a) ✓ Samples (b) Populations
 - (c) Complete study
 - (d) Complete universe
14. The phase of statistics that is concerned with the description and analysis of sample or population data is called:
 - (a) Inferential statistics
 - (b) ✓ Descriptive statistics
 - (c) Inductive statistics
 - (d) Sample statistics
15. The phase of statistics that is concerned with the procedures and methodology for obtaining valid conclusions is called:
 - (a) Descriptive statistics
 - (b) Deductive statistics
 - (c) ✓ Inferential statistics
 - (d) Sample statistics

16. Continuous data are differentiated from discrete data in that:
- Discrete data classes are represented by fractions
 - Continuous data classes may be represented by fractions
 - Continuous data take on only whole numbers
 - Discrete data can take on any real number
17. Information recorded in its original form, whether counts or measurements, is referred to as:
- Continuous data
 - Raw data
 - Discrete data
 - Arrayed data
18. Life of a T.V. tube is a:
- Discrete variable
 - Continuous variable
 - Qualitative variable
 - Constant
19. A constant can assume:
- Only one value
 - More than one value
 - Different values
 - No value at all
20. A statistic which is not measurable is called:
- A constant
 - An attribute
 - A variable
 - A parameter
21. The number 4.50001 rounded off to nearest unit (whole number) is:
- 4
 - 5
 - 4.5
 - 4.01
22. The number 5.56500 rounded off to nearest hundredth (two decimal places) is:
- 5.57
 - 5.56
 - 6.00
 - 5.00
23. The number 143.9500 rounded off to nearest tenth (one decimal place) is:
- 143.9
 - 144.0
 - 143.0
 - 144
24. The number 5.0435001 rounded off to nearest thousandth (three decimal places) is:
- 5.043
 - 5.044
 - 5.050
 - 5.000
25. The number 136.500 rounded off to nearest unit (whole number) is:
- 136
 - 137
 - 136.5
 - 136.0
26. The data which have not undergone any statistical treatment are:
- Primary data
 - Secondary data
 - Discrete data
 - Qualitative data
27. Issuing a national identity card is an example of:
- Census
 - Registration
 - Sampling
 - Investigation through enumerators
28. A collection of all the elements in a group is called:
- Population
 - Sample
 - Data
 - Registration
29. A collection of some of the elements from a group is called:
- Census
 - Population
 - Sample
 - Registration
30. Continuous variable can be measured at:
- Specific points
 - All possible points
 - No points
 - Integer points
-

Presentation of Data

1. Classification is the process of arranging data according to:
 - (a) One characteristic
 - (b) Two or more characteristics
 - (c) ✓ Similar characteristics
 - (d) Different characteristics
2. Important bases of classification are:
 - (a) Two (b) Three
 - (c) ✓ Four
 - (d) More than four
3. Data classified by attributes are called:
 - (a) Continuous data
 - (b) Quantitative data
 - (c) ✓ Qualitative data
 - (d) Grouped data
4. Data which have been arranged in ascending or descending order are called:
 - (a) Raw data (b) Grouped data
 - (c) ✓ Arrayed data
 - (d) Ungrouped data
5. As a general rule, when arranging data statisticians tend to use:
 - (a) Less than six classes
 - (b) ✓ Between six and fifteen classes
 - (c) More than twenty classes
 - (d) Only fifteen classes
6. Two methods of data arrangement are:
 - (a) ✓ Array and frequency distribution
 - (b) Frequency distribution and histogram
 - (c) Array and frequency polygon
 - (d) Histogram and array
7. Classification of data according to locations or areas is called:
 - (a) Temporal classification
 - (b) ✓ Geographical classification
 - (c) Quantitative classification
 - (d) Qualitative classification
8. An ogive is a:
 - (a) Frequency curve
 - (b) Frequency polygon
 - (c) ✓ Cumulative frequency polygon
9. (d) Frequency histogram
Title of a table should be in:
 - (a) Lower case letters
 - (b) ✓ Capital letters
 - (c) Italic and lower case letters
 - (d) Twenty letters
10. If a curve can be divided into two parts that are images, it is called a:
 - (a) Skewed curve
 - (b) ✓ Symmetrical curve
 - (c) J-Shaped curve
 - (d) Frequency curve
11. The process of arranging data into rows and columns is called:
 - (a) Frequency distribution
 - (b) Classification
 - (c) ✓ Tabulation (d) Array
12. Which of the following is an example of compressed data?
 - (a) Array
 - (b) ✓ Frequency distribution
 - (c) Histogram (d) Ogive
13. Which of the following statements about histogram rectangles is correct?
 - (a) ✓ The rectangles are proportional in height to the number of items falling in the classes
 - (b) There are generally five rectangles in every histogram
 - (c) Heights all of rectangles are equal
 - (d) None of these
14. When constructing a frequency distribution, the first step is:
 - (a) Divide the data into at least five classes
 - (b) Arrange the data into an array
 - (c) ✓ Decide on the type and number of classes for dividing the data
 - (d) None of these
15. As the number of observations and classes increase, the shape of a frequency polygon:
 - (a) ✓ Tends to become increasingly

- smooth
 (b) Tends to become jagged
 (c) Stays the same
 (d) Varies if data become more reliable
16. Which of the following statements is true, of cumulative frequency polygons or ogives for a particular set of data?
 (a) Both 'less than' and 'or more' curves have the same shape
 (b) 'Or more' curves slope up and to the right
 (c) 'Less than' curves slope down and to the right
 (d) ✓ 'Less than' curves slope up and to the right
17. In constructing a frequency distribution for a number of classes depends on:
 (a) The number of data points
 (b) The range of the data collected
 (c) The size of the population
 (d) ✓ Both (a) and (b) but not (c)
18. As a general rule, statisticians tend to use which of the following number of classes when arranging data:
 (a) Fewer than five
 (b) Between one and five
 (c) ✓ Between 20 and 25
 (d) More than 30
 (e) None of these
19. A relative frequency distribution presents frequencies in terms of:
 (a) Fractions
 (b) Whole numbers
 (c) Percentages
 (d) ✓ Both (a) and (c) but not (b)
20. Graphs of frequency distributions are used because:
 (a) They have a long history in practical applications
 (b) ✓ They attract attention to data pattern
 (c) They account for biased or incomplete data
21. Continuous data are differentiated from discrete data in that:
 (a) Discrete data classes are represented by fractions
 (b) ✓ Continuous data classes may be represented by fractions
 (c) Continuous data take on only whole numbers
 (d) Discrete data can take on any real number
22. Which of the following statements is true?
 (a) ✓ As a rule statisticians generally use between 6 and 15 classes
 (b) As a rule, statisticians regard a frequency distribution incomplete if it has fewer than 20 classes
 (c) Classes describe only one characteristic of the data being organized
 (d) None of these
23. A graph of a cumulative frequency distribution is called
 (a) Histogram
 (b) Frequency polygon
 (c) ✓ Ogive (d) None of these
24. Data classified by attributes are called:
 (a) Grouped data
 (b) ✓ Qualitative data
 (c) Quantitative data
 (d) Arrayed data
25. Data arranged in order of magnitude are called:
 (a) Raw data (b) Grouped data
 (c) ✓ Arrayed data
 (d) Frequency distribution

Measures of Central Tendency

1. What is the major assumption we make when computing a mean from grouped date?
 - All values are discrete
 - Every value in a class is equal to the midpoint
 - No value occurs more than once,
 - Each class contains exactly the same number of values
2. When calculating the average rate of debt growth for a company, the correct mean to use is:
 - Arithmetic mean
 - Weighted arithmetic
 - Geometric mean
 - None of these
3. Which of the following is the first step in calculating the median of a data set?
 - Average the middle two values of the data set
 - Array the data
 - Determine the relative weights of the data values in terms of importance
 - None of these
4. Which of the following is an advantage or are advantages of using a median?
 - Extreme values affect the median less strongly than they do the mean
 - A median can be calculated for qualitative data
 - The median is easy to understand
 - All of these
5. When a distribution is symmetrical and has one mode, the highest point on the curve is called the:
 - Mode
 - Median
 - Mean
 - All of these
6. When referring to a curve that tails off to the left end, you would call it:
 - Symmetrical
7. In which of these cases would the mode be most useful as an indicator of central tendency?
 - Every value in a data set occurs exactly once
 - All but three values in a data set occur once; three values occur 5 times each
 - All values in a data set occur 10 times each
 - Every observation in a data set has the same value
8. Why is it usually better to calculate a mode from grouped data rather than ungrouped data?
 - The ungrouped data tend to be bimodal
 - The mode for the grouped data will be the same
 - Extreme values have less effect on grouped data
 - The chance of an unrepresentative value being chosen as the mode is reduced
9. When referring to a curve whose longer tail is to the right, you would call it:
 - Symmetrical
 - Positively skewed
 - Negatively skewed
 - None of these
10. If the mean is less than mode, the distribution is:
 - Positively skewed
 - Negatively skewed
 - Symmetrical
 - None of these
11. The mean is affected by
 - Change of origin
 - Scale of measurement
 - Both (a) and (c)
 - None of these
12. Sum of squares of deviations of the

Measures of Dispersion, Skewness and Kurtosis

1. Which of the following is a relative measure of dispersion?
 - (a) Standard deviation
 - (b) Variance
 - (c) ✓ Coefficient of variation
 - (d) All of these
2. If you divide the standard deviation of the values by the mean of the same values and multiply by 100, you will get:
 - (a) Variance
 - (b) ✓ Coefficient of variation
 - (c) Mean deviation
 - (d) Mean coefficient of dispersion
3. The square root of the variance of a distribution is the
 - (a) ✓ Standard deviation
 - (b) Mean deviation
 - (c) Absolute deviation
 - (d) None of these
4. The main advantage of using the range as a measure of dispersion is that:
 - (a) ✓ It is easy to calculate
 - (b) It is heavily influenced by extreme values
 - (c) It can change drastically from one data set to the next
 - (d) It is determined by only two points in the data set
5. Why is it necessary to square the differences from the mean when computing the standard deviation?
 - (a) So that the extreme values will not affect the calculation
 - (b) ✓ Some of the differences will be positive and some will be negative
 - (c) The number of values involved is very small
 - (d) None of these
6. The sum - of absolute deviations is a minimum if these deviations are taken from the:
 - (a) Mean
 - (b) ✓ Median
 - (c) Mode
 - (d) All of these
7. The variance of a constant is equal to:
 - (a) Constant
 - (b) ✓ Zero
 - (c) Unity
 - (d) None of these
8. The standard deviation is independent of:
 - (a) ✓ Change of origin
 - (b) Change of scale of measurement
 - (c) Change of origin and scale of measurement
 - (d) None of these
9. Which of the following measures of dispersion is independent of the units employed?
 - (a) Standard deviation
 - (b) Quartile deviation
 - (c) ✓ Coefficient of variation
 - (d) Variance
10. If X and Y are independent, then $\text{Var}(X - Y)$ is equal to:
 - (a) ✓ $\text{Var}(X) + \text{Var}(Y)$
 - (b) $\text{Var}(X) - \text{Var}(Y)$
 - (c) $\text{Var}(X + Y)$
 - (d) Zero
11. Standard deviation of 2, 2, 2, 2 is equal to:
 - (a) z
 - (b) 8
 - (c) ✓ Zero
 - (d) 4
12. If the third moment about mean is zero ($m_3 = 0$), then the distribution is:
 - (a) Mesokurtic
 - (b) Positively skewed
 - (c) ✓ Symmetrical
 - (d) Negatively skewed
13. If the moment coefficient of kurtosis $b_2 = 3$, then the distribution is:
 - (a) Platykurtic
 - (b) Positively skewed
 - (c) Symmetrical
 - (d) ✓ Mosokurtic
14. Which measure of dispersion is considered as the best general purpose measure of dispersion?

- (a) Range
 (b) Semi-interquartile range
 (c)✓ Standard deviation
 (d) Mean deviation
15. To compare the variation of two or more than two series, we use:
 (a) Mean absolute deviation
 (b) Variance
 (c)✓ Coefficient of variation
 (d) Corrected standard deviation
16. The distribution is mesokurtic if the moment coefficient of kurtosis b_2 is:
 (a) Equal to 0 (b)✓ Equal to 3
 (c) Less than 3
 (d) Greater than zero
17. The distribution is positively skewed if:
 (a) Mean < Mode
 (b) Mean > Mode
 (c) Mean > Median
 (d)✓ (b) and (c)
18. Moment ratios b_1 and b_2 are:
 (a) Expressed in original unit of the data
 (b) Dimensionless quantities
 (c) Independent of origin and scale of measurement
 (d)✓ (b) and (c)
4. The number of ways in which four books can be arranged on a shelf is:
 (a) 4 (b) 6
 (c)✓ 24 (d) 12
5. How many possible permutations can be formed from the wood committee?
 (a)✓ 45360 (b) 9!
 (c) 6! (d) None of these
6. In how many ways a team of 4 players be chosen from a total 10 persons?
 (a) 40 (b)✓ 210
 (c) 5040 (d) None of these
7. If n is the number of elements of a set, the total number of subsets of this set is:
 (a) $2n$ (b) n^2
 (c)✓ 2^n (d) $2n$
8. The number of terms in the expansion of the binomial $(p + q)^n$ is:
 (a) n (b) $n - 1$
 (c)✓ $n + 1$ (d) $2n$
9. ${}^4C_5 = \underline{\hspace{2cm}}$
 (a) 5 (b) 1/5
 (c)✓ 0 (d) None of these
10. A coin and die can be thrown together in:
 (a) 2 ways (b) 12 ways
 (c) 8 ways (d)✓ None of these

Rules of Counting

1. A person can choose a tie and a suit from 3 suits and 5 ties in:
 (a) 8 ways (b)✓ 15 ways
 (c) 30 ways (d) None of these
2. Three seats on a sofa can be occupied by four persons in:
 (a) 12 ways (b) 7 ways
 (c)✓ 24 ways (d) None of these
3. The number of ways in which a person enters by one door and leaves by a different door in a room with three doors is:
 (a) 9 (b)✓ 6
 (c) 5 (d) None of these

Index Numbers

1. If an index number calculation over 8 years with a base value of 100 gave an index for 2011 of 110, what would be the percentage relative for 2011?
 (a) ✓ 110 (b) 90.0
 (c) 13.75 (d) 880
2. If all the values considered in equal importance, the index are of equal importance, the index is:
 (a) Weighted (b) Simple
 (c) ✓ Unweighted
 (d) None of these
3. When the base year values are used as weights, the weighted average of relatives price index is the same as:
 (a) The Paasche's index
 (b) ✓ The Laspeyres' index
 (c) The unweighted average of relatives price index
 (d) None of these
4. Commodities subject to considerable price variations can best be measured by a:
 (a) Price index
 (b) ✓ Quantity index
 (c) Value index
 (d) None of these
5. A number that expresses the relative change in prices, quantity or value compared to a base period is called an
 (a) ✓ Index number
 (b) Data
 (c) Report (d) None of these
6. The weights used in a quantity index are:
 (a) Percentages of total quantity
 (b) ✓ Prices
 (c) Average of quantities
 (d) None of these
7. The weights used in a price index are:
 (a) Percentage of total price
 (b) ✓ Quantities
 (c) Average of prices
8. (d) None of these.
 The base period can be described as a 'normal' period if:
 (a) ✓ It is neither the peak nor the trough of a fluctuation
 (b) It is the most recent period for which we have data
 (c) It is the average of several consecutive periods
 (d) None of these
9. A primary difference between average of relatives and aggregates methods is that:
 (a) ✓ Aggregates methods sum all prices before finding the ratio
 (b) Average of relatives methods sum all prices before finding the ratio
 (c) Aggregates methods are useful for price indices
 (d) None of above
10. Which of the following methods uses quantities consumed in the current period when computing a weighted index?
 (a) Laspeyres' method
 (b) ✓ Paasche's method
 (c) Marshall – Edge worth's method
 (d) Fisher's method
11. Which of the following methods uses quantities consumed in the base period when computing a weighted index?
 (a) ✓ Laspeyres' method
 (b) Paasche's method
 (c) Fisher's method
 (d) None of these
12. Time reversal test is satisfied by:
 (a) Laspeyres index
 (b) Paasche's index
 (c) ✓ Fisher's index only
 (d) Marshall – Edgeworth index only
 (e) (c) and (d)
13. Factor reversal test is satisfied by:

- (a) Laspeyres' index
 (b) Paasche's index
 (c) ✓ Fisher's index
 (d) Marshall - Edgeworth index
14. Which of the following indices satisfies both the time reversal and factor reversal tests?
 (a) Laspeyres index
 (b) Paasche's index
 (c) ✓ Fisher's index
 (d) Marshall - Edge worth
15. Circular test is satisfied by:
 (a) Laspeyres' index
 (b) Paasche's index
 (c) Fisher's index
 (d) ✓ None of these
16. To measure how much the cost of some variable changes over time, you would use:
 (a) A value index
 (b) An inflation index
 (c) A quantity index
 (d) ✓ None of these
17. Commodities subject to considerable price variation should best be measured by:
 (a) Quantity index
 (b) An inflation index
 (c) ✓ Value index
 (d) None of these
18. Theoretically best average used in the construction of composite index is
 (a) The arithmetic mean
 (b) ✓ The geometric mean
 (c) The median
 (d) The harmonic mean
19. Which of the following indices has an upward bias?
 (a) ✓ Laspeyres index
 (b) Paasche's index
 (c) Fisher's index
 (d) None of these
20. Which of the following indices has a downward bias?
 (a) Laspeyres index
 (b) ✓ Paasche's index
- (c) Marshall - Edgeworth index
 (d) None of these
21. Which is the most suitable average in chain base method?
 (a) Arithmetic mean
 (b) Median
 (c) ✓ Geometric mean
 (d) Weighted arithmetic mean
22. The prices used in the construction of consumer price index numbers are:
 (a) ✓ The retail prices
 (b) The wholesale prices
 (c) The fixed prices
 (d) None of these
24. The consumer price index number is also called:
 (a) The cost of living index number
 (b) The retail price index number
 (c) The wholesale price index number
 (d) ✓ (a) and (b)
25. Which method of construction of consumer price index number is the Laspeyres' index number?
 (a) ✓ Aggregate expenditure method
 (b) Family budget method
 (c) Both (a) and (b)
 (d) None of these
26. Which of the following price indices are prepared by Federal Bureau of Statistics?
 (a) Wholesale price index
 (b) Consumer price index
 (c) Sensitive price indicator
 (d) ✓ All of these
-

Probability

1. If one event is unaffected by the outcome of another event, the two events are said to be:
 (a) Dependent (b) ✓ Independent
 (c) Mutually exclusive
 (d) Both (b) and (c)
2. Symbolically, a marginal probability is:
 (a) $P(AB)$ (b) ✓ $P(A)$
 (c) $P(A|B)$
 (d) (a) and (b)
3. The simple probability of occurrence of an event is called the:
 (a) Joint probability
 (b) Conditional probability
 (c) ✓ Marginal probability
 (d) Subjective probability
4. Why are the outcomes of a coin tossing mutually exclusive?
 (a) The outcome of any toss is not affected by the outcome of those preceding it
 (b) ✓ Both a head and a tail cannot turn up on anyone toss
 (c) The probability of getting a head and the probability of getting a tail is the same
 (d) All of these
5. What is the probability that a value chosen at random from a particular population is larger than the median of the population?
 (a) 0.25 (b) ✓ 0.5
 (c) 1.0 (d) 0.67
6. What is the probability that a ball drawn at random from the bag is:
 (a) 0.1 (b) 0.4
 (c) 1.0
 (d) ✓ Cannot be determined from given information
7. When two dice are rolled, the number of possible sample points is:
 (a) 6 (b) 12
 (c) ✓ 36 (d) 48
8. "Population and Sample" is a term used in:
 (a) Chemistry (b) Physics
 (c) Biology (d) ✓ Statistics
9. If $P(A \text{ or } B) = P(A)$, then:
 (a) A and B are mutually exclusive
 (b) The Venn diagram areas for A and B overlap
 (c) $P(A) + P(B)$ is the joint probability of A and B
 (d) ✓ None of these
10. If a Venn diagram is drawn for events A and B which are mutually exclusive, which of the following would always be true of A and B ?
 (a) Their parts of the rectangle will overlap
 (b) Their parts of the rectangle will be equal in area
 (c) ✓ Their parts of the rectangle will not overlap
 (d) None of these
11. For two mutually exclusive events A and B . $P(A) = 0.2$ and $P(B) = 0.4$, then $P(A \cup B)$ is
 (a) 0.8 (b) 0.2
 (c) ✓ 0.6 (d) 0.5
12. For two independent events A and B , $P(A) = 0.6$ and $P(B) = 0.3$, then $P(A \cap B)$ is:
 (a) 0.9 (b) 0.12
 (c) 0.5 (d) ✓ 0.18
13. If A and B are mutually exclusive events, then $P(A \cup B) = P(A) + P(B)$. How does the calculation of $P(A \cup B)$ change if A and B are not mutually exclusive?
 (a) ✓ $P(A \cap B)$ must be subtracted from $P(A) + P(B)$
 (b) $P(A \cap B)$ must be added to $P(A) + P(B)$
 (c) $[P(A) + P(B)]$ must be multiplied by $P(A \cap B)$
 (d) $[P(A) + P(B)]$ must be divided

by $P(A \cap B)$

14. Assume that a single fair die is rolled once. Which of the following is true?
 - (a) The probability of rolling a number greater than '1' is $1 - P('1' \text{ is rolled})$
 - (b) The probability of rolling a '3' is $1 - P(1, 2, 4, 5 \text{ or } 6 \text{ is rolled})$
 - (c) The probability of rolling a '5' or '6' is higher than the probability of rolling a '3' or '4'
 - (d)✓ (a) and (b)
15. If $P(B|A) = 0.25$ and $P(A \cap B) = 0.20$, then $P(A)$ is:
 - (a) 0.05
 - (b)✓ 0.8
 - (c) 0.95
 - (d) 0.75
16. Ten numbered balls are placed in an urn. Numbers 1 – 4 are red and numbers 5 – 10 are blue. The probability that a ball drawn at random from the urn is blue is:
 - (a) 0.1
 - (b) 0.4
 - (c)✓ 0.6
 - (d) 1.0
17. For two independent events A and B, $P(A) = 0.6$ and $P(B) = 0.3$. Then $P(A \cup B)$ is:
 - (a) 0.9
 - (b) 0.18
 - (c)✓ 0.72
 - (d) None of these
18. If $P(B|A) = P(B)$, then A and B are:
 - (a) Mutually exclusive
 - (b) Dependent
 - (c)✓ Independent
 - (d) None of the these
19. If $P(A \cup B) = P(A) + P(B)$, then A and B are:
 - (a)✓ Mutually exclusive
 - (b) Independent
 - (c) Not mutually exclusive
 - (d) None of these

Random Variables and Probability Distributions

1. Random numbers can be generated:
 - (a) Manually
 - (b) Mechanically
 - (c)✓ (a) and (b)
 - (d) None of these
2. Random numbers can be generated manually by:
 - (a) Drawing cards from numbered cards
 - (b) Rotating or spinning numbered wheels
 - (c) Use of random numbers table
 - (d)✓ All of these
3. Random numbers can be generated mechanically by:
 - (a) By use of digital computers
 - (b) Programmable calculators
 - (c) Ordinary calculators
 - (d)✓ (a) and (b)
4. A random variable is also called a:
 - (a) Chance Variable
 - (b) Stochastic variable
 - (c) Constant
 - (d)✓ (a) and (b)
5. Which of the following is a characteristic of the probability distribution for any random variable?
 - (a) A probability is provided for every possible value
 - (b) The sum of all probabilities is 1
 - (c) No given probability occurs more than once
 - (d)✓ (a) and (b)
6. A discrete probability distribution may be represented by:
 - (a) A table
 - (b) A graph
 - (c) A mathematical equation
 - (d)✓ All of these
7. A continuous probability distribution may be represented by:
 - (a) A table
 - (b) A graph
 - (c) A mathematical equation
 - (d)✓ (b) and (c)
8. If the random variable X denotes the number of heads when three distinct

- coins are tossed, then X assumes the value:
- 0, 1, 2, 3,
 - 1, 3, 3, 1
 - 1, 2, 3
 - None of these
9. If X is a discrete random variable, then the function $F(x)$ is:
- A probability function
 - A probability density function
 - A density function
 - A distribution function
10. If X is a continuous random variable, then the function $F(x)$ is:
- A probability function
 - A probability density function
 - A density function
 - (b) and (c)
11. The distribution function $F(x)$ is equal to:
- $P(X = x)$
 - $P(X \leq x)$
 - $P(X \geq x)$
 - None of these
12. The expected value of a discrete random variable is:
- Always an integer
 - Always one of the values that the random variable can assume
 - An interval of values
 - None of these
13. If X and Y are random variables, then $E(X - Y)$ is equal to:
- $E(X) + E(Y)$
 - $E(X) - E(Y)$
 - $X - E(Y)$
 - $E(X) - Y$
14. If X and Y are independent random variables, then $\text{Var}(X - Y)$ is equal to:
- $\text{Var}(X) - \text{Var}(Y)$
 - $\text{Var}(X) + \text{Var}(Y)$
 - $E(X - Y)^2$
 - $E(X + Y)^2$
15. If X and Y are independent random variables, then $E(XY)$ is equal to:
- $E(XY)$
 - $E(X)E(Y)$
 - $XE(y)$
 - $YE(X)$
16. If X is a random variable and a and b are constants, then $\text{Var}(a + bX)$ is equal to:
- $\text{Var}(a) + \text{Var}(bX)$

- $\text{Var}(a) + b\text{Var}(X)$
 - $b^2\text{Var}(X)$
 - $b\text{Var}(X)$
17. If X and Y are random variables and a and b are constants, then $E(aX + bY)$ is equal to:
- $E(aX) + E(bX)$
 - $aE(X) + bE(Y)$
 - $(a + b)(E(X) + E(Y))$
 - None of these
18. If X and Y are independent random variables and a and b are constants, then $\text{Var}(aX + bY)$ is equal to:
- $a\text{Var}(X) + b\text{Var}(Y)$
 - $\text{Var}(aX) + \text{Var}(bY)$
 - $a^2\text{Var}(X) + b^2\text{Var}(Y)$
 - $(a + b)(\text{Var}(X) + \text{Var}(Y))$

Binomial and Hypergeometric Distributions

- For a given binomial distribution with a fixed, if $p < 0.6$, then:
 - The binomial distribution will be skewed to the left
 - The binomial distribution will be skewed to the right
 - The binomial distribution will be symmetric
 - None of these
- Repeated independent trials in which there are only _____ possible outcomes and probabilities the outcomes remain the same for all trials are called Bernoulli trials:
 - One
 - Two
 - Three
 - Four
- The mean of a binomial distribution depends on:
 - Probability of success
 - Probability of failure
 - Number of trials
 - (a) and (c)
- The standard deviation of a binomial distribution depends on:
 - Probability of success
 - Probability of failure

5. Which of the following can never be described by a binomial distribution?
 (a) The number of defective items produced by an assembly process
 (b) ✓ The amount of water used by a single household
 (c) The number of students in the class who can answer this question
 (d) All of these can always be described by a binomial distribution
6. The parameters of the binomial distribution $b(x; n, p)$ are:
 (a) x and n (b) x and p
 (c) ✓ n and p (d) x, n and p
7. Which of the following is true for the binomial distribution $b(x; n, p)$?
 (a) ✓ mean > variance
 (b) mean < variance
 (c) mean = variance
 (d) mean = standard deviation
8. The mean, median and mode of the binomial distribution $b(x; n, p)$ will be equal when:
 (a) ✓ $p = 0.5$ (b) $p < 0.5$
 (c) $p > 0.5$ (d) None of these
9. The parameters of the hypergeometric distribution $h(x; N, n, k)$ are:
 (a) x, N, k (b) ✓ N, n, k
 (c) x, n, k (d) x, N, n, k
10. The number of possible outcomes in a Bernoulli trial is:
 (a) Three (b) Four
 (c) ✓ Two (d) One
11. A binomial random variable is a(an):
 (a) Continuous random variable
 (b) ✓ Discrete random variable
 (c) Independent variable
 (d) Dependent variable
12. A hypargeometric random variable is a (an):
 (a) Independent variable
 (b) Continuous random variable
 (c) ✓ Discrete random variable
 (d) None of these
13. In which distribution the probability of success remain constant from trial to trial?
 (a) Hypergeometric distribution
 (b) ✓ Binomial distribution
 (c) Sampling distribution
 (d) Continuous distribution
14. In which distribution the probability of success changes from trial to trial?
 (a) Binomial distribution
 (b) Sampling distribution
 (c) ✓ Hypergeometric distribution
 (d) Continuous distribution
15. In which distribution the successive replacement?
 (a) Hypergeometric distribution
 (b) ✓ Binomial distribution
 (c) Continuous distribution
 (d) None of these
16. In which distribution the successive trials are without replacement?
 (a) ✓ Hypergeometric distribution
 (b) Binomial distribution
 (c) Continuous distribution
 (d) None of these
17. Both binomial and hypergeometric distributions are:
 (a) Continuous probability distributions
 (b) ✓ Discrete probability distributions
 (c) Neither continuous nor discrete probability distributions
 (d) Bivariate distributions

True and False

Introduction to Statistics

(True and False)

- | | | |
|-----|--|-----|
| 1. | Statistics deals with single observation. | T/F |
| 2. | In the plural sense, statistics are aggregates of facts. | T/F |
| 3. | In the singular sense, the word statistics refers to the science comprising methods. | T/F |
| 4. | In the descriptive statistics, the statistician reports data without inference. | T/F |
| 5. | Statistics are numerically expressed. | T/F |
| 6. | Statistics are collected in an unsystematic and haphazard way. | T/F |
| 7. | Statistics are qualitatively expressed. | T/F |
| 8. | Inferential statistics deals with collection, presentation and analysis of data. | T/F |
| 9. | Statistics tests the laws of other sciences. | T/F |
| 10. | Statistics laws are valid in the long run. | T/F |
| 11. | Statistics are collected in a systematic way. | T/F |
| 12. | Statistics are the brain of administration. | T/F |
| 13. | Astronomy is one of the oldest branch statistical study. | T/F |
| 14. | Statistics is one of the oldest branch statistical study. | T/F |
| 15. | Economic laws can be stated in scientific way when based on statistical data. | T/F |
| 16. | Issuing a national identity card is an example of registration. | T/F |
| 17. | Secondary data are obtained from existing sources. | T/F |
| 18. | Publications of State Bank of Pakistan are primary data.. | T/F |
| 19. | The number of flowers on a tree is a discrete variable | T/F |
| 20. | The amount of milk given by a cow is discrete variable. | T/F |
| 21. | The age of a book seller is a continuous variable. | T/F |
| 22. | Colour of eyes of 100 persons is a quantitative variable. | T/F |
| 23. | Liking of 500 persons for a certain T.V. program is a qualitative variable. | T/F |
| 24. | A qualitative variable is also called a variable. | T/F |
| 25. | A qualitative variable is also called an attribute. | T/F |

Answers

1.	F	2.	T	3.	T	4.	F	5.	T
6.	F	7.	F	8.	F	9.	T	10.	T
11.	T	12.	F	13.	T	14.	F	15.	T
16.	T	17.	T	18.	F	19.	T	20.	F
21.	T	22.	F	23.	T	24.	F	25.	T

Presentation of Data

(True and False)

- | | | | |
|-----|---|--|-----|
| 1. | Classification is the process of arranging the data according to dissimilarities. | | T/F |
| 2. | Tabulation is the process of arranging data into a table. | | T/F |
| 3. | Data classified by geographical regions or locations is called chronological data. | | T/F |
| 4. | Data classified by time of occurrence is called chronological data. | | T/F |
| 5. | Data classified by attributes is called qualitative data. | | T/F |
| 6. | Data classified by locations is called geographical data. | | T/F |
| 7. | One way classification is called complex tabulation. | | T/F |
| 8. | Two way classification is called double tabulation. | | T/F |
| 9. | The heading for various rows are called row captions. | | T/F |
| 10. | The portion of the table containing column captions is called stub. | | T/F |
| 11. | Data arranged by months or year is called Qualitative data. | | T/F |
| 12. | Class interval size is the difference between upper and lower class boundaries of a class. | | T/F |
| 13. | Class marks is the difference between upper and lower class limits of a class. | | T/F |
| 14. | A frequency distribution involves only one variable is called uni variate frequency distribution. | | T/F |
| 15. | There are only two steps in the construction of frequency distribution. | | T/F |
| 16. | The source note and foot note are same. | | T/F |
| 17. | Cumulative frequency is increasing. | | T/F |
| 18. | A less than ogive is S-shaped and slope down to the right. | | T/F |
| 19. | The class width of a frequency distribution are always of equal size. | | T/F |
| 20. | There are three important bases for classification. | | T/F |
| 21. | In Histogram, class interval size is always equal. | | T/F |
| 22. | Multiple bar chart is suitable when two or more variables are present with total. | | T/F |
| 23. | A Histogram consists of set of adjacent rectangles. | | T/F |
| 24. | A frequency polygon is closed figure of one side. | | T/F |
| 25. | A cumulative frequency polygon is also called ogive. | | T/F |
| 26. | An ogive is of two types. | | T/F |
| 27. | A frequency curve touches x-axis. | | T/F |
| 28. | A frequency polygon touches x-axis. | | T/F |
| 29. | In Pie char the arrangement of the sector is anti clockwise. | | T/F |
| 30. | In graph, the dependent variable (time) should always taken along the x-axis. | | T/F |

Answers

1.	F	2.	T	3.	F	4.	T	5.	T
6.	T	7.	F	8.	T	9.	T	10.	F
11.	F	12.	T	13.	F	14.	T	15.	F
16.	F	17.	T	18.	F	19.	T	20.	F
21.	F	22.	T	23.	T	24.	F	25.	T
26.	T	27.	F	28.	T	29.	T	30.	F

Measures of Location

(True and False)

- | | | |
|-----|--|-----|
| 1. | The average is also called measurement of location. | T/F |
| 2. | The average is measurement of dispersion. | T/F |
| 3. | There are three important types of average. | T/F |
| 4. | The most frequently value in the data is median. | T/F |
| 5. | For n positive numbers A.M. \geq G.M \geq H.M. | T/F |
| 6. | Sum of the deviations of the value for their mean is zero. | T/F |
| 7. | Sum of squares of deviations of the value for Median is least. | T/F |
| 8. | Second quartile is equal to 50th percentile. | T/F |
| 9. | The mean of the values 4, 4, 4, 4 is 4. | T/F |
| 10. | If frequency curve has longer tail to right the Median is greater than AM. | T/F |
| 11. | G.M is the nth root of the product of 'n' positive values. | T/F |
| 12. | If frequency curve has longer tail to left the mean is less than the Mode. | T/F |
| 13. | A set of data may have two or more mode. | T/F |
| 14. | The difference between the highest and smallest values in the data is called Median. | T/F |
| 15. | Third decile is equal to lower quartile. | T/F |
| 16. | The median is appropriate average in a highly skewed distribution. | T/F |
| 17. | For positively skewed distribution, Median is greater than Mode. | T/F |
| 18. | For negatively skewed distribution, Median is greater than Mode. | T/F |
| 19. | The mode is affected by extreme values. | T/F |
| 20. | If any value in the data is zero, the H.M cannot be computed. | T/F |
| 21. | If 5 is multiplied to all the values in the data, then mean is also multiplied by 5. | T/F |
| 22. | If 2 is added to all the values in the data, then mean is subtracted by 2. | T/F |
| 23. | For any numerical data, mode is exist. | T/F |
| 24. | Sum of squares of deviations of the values from the median is least. | T/F |
| 25. | Sum of absolute deviations of the values from the median is least. | T/F |
| 26. | Mean is not affected by scale of measurement. | T/F |
| 27. | Median is not affected by large values. | T/F |
| 28. | A distribution having one mode is called bimodal distribution. | T/F |
| 29. | The median of the values 8, 5, 3, 10, 12 is 3. | T/F |
| 30. | The mode of the values 4, 5, 8, 5, 10, 9, 12 is 5. | T/F |
| 31. | In a symmetrical distribution mean = 10 med = 10 mode = 10 | T/F |
| 32. | A value which occur the greatest number of items in the data is called median. | T/F |
| 33. | If $x = 4$ then $\sum (x - 4)^2$ is minimum. | T/F |
| 34. | Median is the central value in the data if the data are not arranged. | T/F |
| 35. | Harmonic mean is suitable average for percentages and ratio's. | T/F |
| 36. | A value which divides the arrayed set of data into the equal parts is called Decile. | T/F |
| 37. | For Skewed distribution Mode = 3Median - 2 Mean. | T/F |
| 38. | G.M is calculated if any value in the data is zero. | T/F |
| 39. | H.M is appropriate average for calculating rate of change. | T/F |
| 40. | Mode is not based on all the values. | T/F |

Answers

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

Measures of Dispersion Skewness and Kurtosis

(True and False)

1. The simplest measure of dispersion is Mean Deviation. T/F
2. The difference between largest and smallest value in the data is called range. T/F
3. The Quartile deviation is the difference between third and first quartiles. T/F
4. The difference between third and first quartiles is called interquartile range. T/F
5. The degree of scatterness from some central value is called dispersion. T/F
6. The measures of dispersion can be negative. T/F
7. The measures of dispersion are changed by the change of origin. T/F
8. The measures of dispersion are changed by the change of scale. T/F
9. The mean deviation is least when deviation are taken from mean. T/F
10. The mean deviation from the median is minimum. T/F
11. The mean deviation of a set of n values x_1, x_2, \dots, x_n is $\frac{\sum |x_i - \bar{x}|}{n}$ T/F
12. Standard deviation of the values 5, 5, 5, 5 is 5. T/F
13. The standard deviation of a constant is constant itself. T/F
14. The square of standard deviation is called variance. T/F
15. Mean deviation is always greater than S.D. T/F
16. A series of data having greater coefficient of variation is considered more consistent. T/F
17. An absolute measure of dispersion is independent of unit of measurement. T/F
18. Variance of a constant is zero. T/F
19. $\text{Var}(x + y) = \text{Var}(x) + \text{Var}(y)$ T/F
20. $\text{Var}(x - y) = \text{Var}(x) - \text{Var}(y)$ T/F
21. For normal distribution, approximately 95% of the values lies between the limits $x \pm S$. T/F
22. The second moment about mean is equal to variance. T/F
23. In a symmetrical distribution the coefficient of skewness will always be +1. T/F
24. The coefficient of variation is a relative measure of dispersion. T/F
25. Coefficient of Quartile Deviation is an absolute measure of dispersion. T/F
26. Variance is the square root of standard deviation. T/F
27. The lack of uniformity is called skewness. T/F
28. The first moment about zero is mean. T/F
29. If $b_1 = 0$ the distribution is symmetrical. T/F
30. A leptokurtic distribution is flat-topped. T/F
31. If $b_2 = 3$ the distribution is said to be leptokurtic. T/F

32. $\text{Var}(2x + 5) = 4 \text{ Var}(x)$ T/F
 33. $S.D(2x + 5) = 4 S.D(x)$ T/F
 34. Bowley's Coefficient of Skewness always lies between -1 and +1. T/F
 35. The mean deviation from mean is minimum. T/F
 36. Every symmetrical curve is platykurtic. T/F
 37. Variance of the values 4, 4, 4, 4 is zero. T/F
 38. Coefficient of variation used to compare the dispersion of two or more series. T/F
 39. For the normal distribution, $M.D = 0.6969 S.D.$ T/F
 40. Variance is an absolute measure of dispersion. T/F

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

Index Number	
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(True and False)

1. The simplest form of an index number is unweighted index. T/F
 2. The link relatives can directly used to make comparison. T/F
 3. Link relatives are used in fixed base method. T/F
 4. Index numbers are also called economic barometers. T/F
 5. The index number for a base year is 100 T/F
 6. In index number the selection of base period is not essential. T/F
 7. In chain base method, the G.M as an appropriate average. T/F
 8. All index numbers are not suitable for all purposes. T/F
 9. The changes in wholesale or retail prices are measured in price index numbers. T/F
 10. A simple index measures the variation of two or more variables. T/F
 11. There are four types of index numbers. T/F
 12. Index numbers are reliable for long period comparison. T/F
 13. The aggregative index, measures the changes living and industrial production. T/F
 14. There are six steps involved in the construction of index number. T/F
 15. In link relatives, the given year price is divided the base year price. T/F
 16. Chain base method is better than fixed base method. T/F
 17. Consumer's price index numbers are computed by Fisher's formula. T/F
 18. Fisher's index is also called Ideal Index numbers. T/F
 19. Laspyre's index has upward bias. T/F
 20. In fixed base method, the base year should not be normal. T/F
 21. The basket of goods is used in the cost of living index number. T/F
 22. Mean is an appropriate average in chain base method. T/F
 23. The consumer price index measures the variation based on single variable. T/F

24. In Laspeyre's method, quantities used in current years are used as weights. T/F
 25. In Paasche's method, quantities used in current years are used as weights. T/F
 26. Paasche's formula is used for consumer price index numbers. T/F
 27. The value index measures the combined effects of price and quantity changes. T/F
 28. For a particular purpose only, we used special purpose index. T/F
 29. For comparison of index number, the link relatives has not to be converted to a fixed base. T/F
 30. Index numbers are independent of units of measurement. T/F
 31. Paasche's index satisfies the time reversal test. T/F
 32. Marshall-Edgeworth satisfies the factor reversal test. T/F
 33. Fisher's index satisfies the time reversal and factor reversal tests. T/F
 34. Laspeyre's method is used for computing wholesale price index. T/F
 35. The quantity weights are used in price index. T/F
 36. Fisher's index is the mean of Laspeyre's and Paasche's index number. T/F
 37. In composite index the general purpose index is used. T/F
 38. Laspeyre's index has downward bias. T/F
 39. There are four methods to construct consumer's price index. T/F
 40. The first step in the construction of wholesale price index is the selection of commodities. T/F

Answers

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

Probability

(True and False)

1. The collection of well defined elements is called a set. T/F
 2. The null set contains one element. T/F
 3. The null set contains no element. T/F
 4. {} is an empty set. T/F
 5. If $A \subset B$ then every element of 'B' is also an element of 'A'. T/F
 6. If $A \subset B$ then every element of 'A' is also an element of 'B'. T/F
 7. A subset 'A' or 'B' which is different from the set 'B' is proper subset of 'B'. T/F
 8. Two sets A and B are said to be disjoint sets of $A \cup B \neq \emptyset$. T/F
 9. Two sets, A and B are said to be disjoint sets if $A \cap B \neq \emptyset$. T/F
 10. Two sets A and B are said to be disjoint sets if $A \cap B = \emptyset$. T/F
 11. Two sets are said to be equal if both are subsets of each other. T/F
 12. If $A = \{2, 4, 6\}$ and $B = \{1, 2, 3, 4, 5\}$ then $B \subseteq A$. T/F

True and False

13. If $A = \{2, 4, 6\}$ and $B = \{1, 2, 3, 4, 5, 6\}$ then $A \subseteq B$. T/F
14. Two sets A and B are said to be overlapping sets if $A \cap B \neq \emptyset$. T/F
15. Two sets A and B are said to be overlapping sets if $A \cap B = \emptyset$. T/F
16. If U is the universal sets, then the complement of ' A' is $U - A$. T/F
17. If $U = \{1, 2, 3, 4, 5, 6\}$ and $A = \{1, 2, 3\}$ then $A \cup (U) = A$. T/F
18. If $U = \{1, 2, 3, 4, 5, 6\}$, $A = \{1, 2, 3\}$ then $A \cup (U) = U$. T/F
19. If $U = \{1, 2, 3, 4, 5, 6\}$, $A = \{1, 2, 3\}$ then $A \cap U = A$. T/F
20. $A \cap B$ denotes for the union of the sets A and B. T/F
21. The complement of the universal set is the null set. T/F
22. An arrangement of objects without caring the order is called permutation. T/F
23. An arrangement of objects without coming the order is called combination. T/F
24. The number of terms in the expansion of the $(q + p)^n$ is $(n - 1)$. T/F
25. The number of terms in the expansion of the $(q + p)^n$ is $n + 1$. T/F
26. The collection of all possible elements is called sample space. T/F
27. An event consists of one sample point is called compound event. T/F
28. An event is a subset of sample space. T/F
29. An event consists of more than one simple point is called compound event. T/F
30. Two events 'A' and 'B' are said to be mutually exclusive if they can occur at the same time. T/F
31. Events having equal chance of occurrence is called equals likely events. T/F
32. Two events 'A' and 'B' are said to be independent if the occurrence of one event does not effect the probability of occurrence of other event. T/F
33. If 'A' and 'B' are independent events then $P(A \cap B) = P(A) \cdot P(B)$. T/F
34. If 'A' and 'B' are dependent events then $P(A \cap B) \neq P(A) \cdot P(B)$. T/F
35. If 'A' and 'B' are mutually exclusive events then $P(A \cup B) = P(A) + P(B)$. T/F
36. If 'A' and 'B' are mutually exclusive events the $P(A \cup B) = P(A) + P(B) - P(A \cap B)$. T/F
37. If 'A' and 'B' are not mutually exclusive events then $P(A \cup B) = P(A) + P(B)$. T/F
38. For two not mutually exclusive events, $P(A \cup B) = P(A) + P(B) - P(A \cap B)$. T/F
39. The probability of sample space is 1. T/F
40. The probability of an event lies between -1 and +1. T/F
41. The probability of an event lies between 0 and 1. T/F
42. If two fair dice are rolled, the probability of getting doublet is $\frac{5}{36}$ T/F
43. If two fair dice are called the probability of getting doublet is $\frac{6}{36}$ T/F
44. If two fair dice is rolled, the probability of getting sun 9 is $\frac{1}{9}$ T/F
45. If a fair dice is rolled, the probability of getting 4 is $\frac{2}{6}$ T/F
46. If three fair coins are tossed; the probability of getting , atleast 2 heads $\frac{4}{8}$ is: T/F
47. If three fair coins are tossed, the probability of getting 3 heads is $\frac{4}{8}$ T/F
48. If 'A' and 'B' are dependent events then $P(A \cap B) = P(A) \cdot P(B)$. T/F

49. If 'A' and 'B' are dependent events then $P(A \cap B) = P(A) \cdot P(B/A)$. T/F
50. If 'A' and 'B' are independent events then $P(A/B) = P(B)$. T/F
51. If A and B are independent events then $P(A \cap B) = P(A) \cdot P(B)$. T/F
52. The relative frequency approach to probability will provide correct probabilities after 50 trials. T/F
53. The probability of drawing a club card from a pack of cards is $\frac{4}{52}$. T/F
54. The probability of drawing a card from a pack of cards is $\frac{4}{52}$. T/F
55. The probability of drawing a picture card from a pack of cards is $\frac{3}{13}$. T/F
56. Probability of an event can never be zero. T/F
57. The probability of an impossible event is always equal to 1. T/F
58. Two independent events cannot be mutually exclusive events. T/F
59. Two mutually exclusive events can be independent. T/F
60. A and A' are not mutually exclusive. T/F
61. $P(B/A)$ is the condition probability of event B given that A' has already occurred. T/F
62. For two independent events 'A' and 'B' the $P(A) = 0.30$ $P(B) = 0.15$ then $P(A \cap B) = 0.45$. T/F
63. $P(A/B) = \frac{P(A \cap B)}{P(B)}$ T/F
64. For two mutually exclusive events, $P(A) = 0.28$ $P(B) = 0.35$ then $P(A \cup B) = 0.63$ T/F
65. For two not mutually exclusive events, $P(A) = 0.40$, $P(B) = 0.25$, then, $P(A \cup B) = 0.65$ T/F

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

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Random Variables and Probability Distribution

(True and False)

- | | | |
|-----|--|-----|
| 1. | A process which generates raw data is called an experiment. | T/F |
| 2. | A random variable is not a function. | T/F |
| 3. | A random variable cannot assume negative values. | T/F |
| 4. | A variable whose values are obtained by the outcomes of a random experiment is called a random variable. | T/F |
| 5. | The random variable is also called a chance variable. | T/F |
| 6. | A random variable having all possible values in a range is called a discrete random variable. | T/F |
| 7. | A random variable assuming each and every value in a range is called a continuous random variable. | T/F |
| 8. | A random variable has always finite number of values. | T/F |
| 9. | A random variable has always discrete set of values. | T/F |
| 10. | A random variable can be negative.. | T/F |
| 11. | The number of houses in a street is continuous variable. | T/F |
| 12. | The age of a book seller is a continuous random variable. | T/F |
| 13. | The sum of probabilities is equal to zero. | T/F |
| 14. | The sum of probabilities is equal to one. | T/F |
| 15. | The speed of car is a continuous random variable. | T/F |
| 16. | The number of flowers on the tree is discrete random variable. | T/F |
| 17. | The life time of T.V tube is a continuous random variable. | T/F |
| 18. | The probability density function can be negative. | T/F |
| 19. | The probability of a particular value is continuous random variable is zero. | T/F |
| 20. | The probability of a particular value is' continuous random variable is 1. | T/F |
| 21. | The continuous probability distribution can be presented in tabular form. | T/F |
| 22. | The continuous probability distribution cannot be presented in tabular form. | T/F |
| 23. | The probability function may be negative. | T/F |
| 24. | The probability function may not be negative. | T/F |
| 25. | If x and y are two independent variables then $\text{var}(x - y) = \text{var}(x) + \text{var}(y)$ | T/F |
| 26. | If x and y are two independent variables then $\text{var}(x - y) = \text{var}(x) - \text{var}(y)$ | T/F |
| 27. | A continuous random variable can assume only a finite number of values. | T/F |
| 28. | $E[x - E(x)] = 0$ | T/F |
| 29. | $E(x) = P(x \geq x)$ | T/F |
| 30. | The graph of the distribution function is called Histogram. | T/F |
| 31. | The graph of the distribution function is called step-diagram. | T/F |
| 32. | The probability density function is non-negative. | T/F |
| 33. | The total area of trapezoid is zero. | T/F |
| 34. | The total area of trapezoid is one. | T/F |
| 35. | The expectation of ' x ' is also called mean. | T/F |
| 36. | If x and y are random variables then $I(x + y) = E(x) - E(y)$ | T/F |
| 37. | If x is a random variable and 'a' and 'b' are constants then $\text{var}(a + bx) = b^2 \text{var}(x)$ | T/F |
| 38. | If $y = -4x$ then $S.D(y) = -4 S.D(x)$ | T/F |
| 39. | For discrete random variable x , $P(x < 5) = P(x \leq 5)$ | T/F |
| 40. | $E(2x + 4) = 2E(x) + 4$ | T/F |

Answers

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

Binomial and Hypergeometric Distributions**(True and False)**

- In a binomial experiment the successive trials are dependent. T/F
- The binomial distribution has three parameters. T/F
- The probability of a success is denoted by p. T/F
- A binomial distribution is symmetrical if $p < q$. T/F
- A binomial distribution is symmetrical if $p = q$. T/F
- A binomial distribution is positively skewed if $p < q$. T/F
- The mean of the binomial distribution is npq . T/F
- The variance of the binomial distribution is npq . T/F
- The mean of a binomial distribution is np . T/F
- In a binomial distribution, mean and variance are equal. T/F
- In a binomial distribution mean is less than variance. T/F
- In a binomial distribution, mean is greater than variance. T/F
- In a binomial random variable 'x' $P(x = 1.5) = 0.57$ T/F
- In a binomial random variable 'x' $P(x = 2) = 0.40$. T/F
- A binomial distribution is negatively skewed if $p > q$. T/F
- The sum of 'p' and 'q' can exceed one. T/F
- The binomial distribution is a discrete distribution. T/F
- The binomial distribution is a continuous distribution. T/F
- The binomial distribution has two parameters. T/F
- A Bernoulli trial having two possible outcomes – success and failure. T/F

Answers

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

Model Papers

for:

- ◆ *Federal Public Service Commission*
- ◆ *Punjab Public Service Commission*
- ◆ *Sindh Public Service Commission*
- ◆ *Baluchistan Public Service Commission*
- ◆ *Khyber Pakhtunkhwa Public Service Commission*
- ◆ *AJ&K Public Service Commission*
- ◆ *Gilgit Baltistan Public Service Commission*
- ◆ *NTS & ETEA*

Lecturers/Subject Specialist Exam

Model Paper –1

Written test for Recruitment to the Posts of Lecturer/Subject Specialist, Statistics (BS-17) Male / Female in the Education Department

Time Allowed: 2 Hour

Maximum Marks: 100

Note:

- (i) All answers are required to be marked on the answer sheet and NOT on this question paper.
- (ii) All questions carry equal marks.
- (iii) Use of Mobile is not allowed.
- (iv) Used of Calculator is not allowed.

- | | |
|--|---|
| <p>1. Statistics is used in the situation of:</p> <ul style="list-style-type: none"> (a) Uncertainty (b) Dealing aggregate data (c) Variability (d) All three (a), (b) & (c) <p>2. Indicate the following for what the type of the data described below is nominal:</p> <ul style="list-style-type: none"> (a) Team scores in a cricket match (b) Daily temperatures in degree Celsius (c) Room numbers in the Holiday Inn hotel (d) Identification of the children who have chicken pox. <p>3. Indicate the discrete variable for the variables given below:</p> <ul style="list-style-type: none"> (a) Batting average of the Pakistan cricket team (b) Number of children of each of 1,000 married graduates of a public university | <p>4. Indicate for which of the following data, the shape of the curve will be normal?</p> <ul style="list-style-type: none"> (a) A computer printout shows the current checking account balances for all the checking customers of the national bank. (b) Diagnostic reading test scores are tabulated for all the low graders in a school of a district. (c) Gifted students in a creative writing class are given the verbal subtest of an intelligent test. (d) A nation wide mathematics exam is given to 1,000 students |
|--|---|

- at a college with a selective admission policy.
5. Indicate for which of the following set of computations, the distribution to the approximately positively skewed?
- Mean is 79.3, median is 75.4 and mode is 72.
 - Mean is 25.6, median is 24.9 and mode is 24.
 - Mean is 128.74, median is 12.68 and mode is 135.
 - Mean is 50.3, median is 49.6 and mode is 50.
6. A probability of 1 represents:
- Impossibility
 - An improbable event
 - A 50–50 (d) Certainty
7. Three coins are tossed. What is probability that there will all be heads?
- $1/8$
 - $1/4$
 - $1/3$
 - $3/2$
8. A cricket team captain wins the toss for three consecutive matches. What is the probability that he will call correctly for the fourth match?
- $1/16$
 - $1/8$
 - $1/4$
 - $1/2$
9. Which one is not the characteristic of a random experiment?
- It has at least two outcomes.
 - The number of all possible outcomes is not known in advance.
 - The outcomes are not predictable in advance.
 - It can be repeated any number of times under similar conditions.
10. A and B are two mutually exclusive events. The probability of A happening is $1/4$. The probability of B happening is $1/3$. The probability of neither A nor B happening is?
- $5/12$
 - $1/2$
 - $3/4$
 - $11/12$
11. A and B are two independent events. The probability of A is $1/4$ and B is $1/3$. The neither probability of A nor B is:
- $5/12$
 - $1/3$
 - $3/4$
 - $11/12$
12. The probability of an event happening is $1/3$. The probability of it not happening is?
- -12
 - 0
 - $2/3$
 - 3
13. If a letter is chosen at random from the 10 letters of the word STATISTICS, what is probability that it is a vowel?
- 0.20
 - 0.23
 - 0.30
 - 0.40
14. Given the following table, what is the probability of selecting a female university graduate student from this group?
- | Graduate | | | |
|----------|------------|-----------|-----|
| College | University | Total | |
| Male | 100 | 36 | 136 |
| Female | 120 | 44 | 164 |
| Total | 220 | 80 | 300 |
| | (a) 0.120 | (b) 0.268 | |
| | (c) 0.265 | (d) 0.147 | |
15. Subjective probabilities are assigned to the events A and B which together comprise a sample space. Which of the following probability statements is not valid?
- $P(A) = 0.7, P(B) = 0.5, P(A \text{ and } B) = 0.2$
 - $P(A) = 0.9, P(B) = 0.7, P(A \text{ and } B) = 0.6$
 - $P(A) = 0.4, P(B) = 0.3, P(A \text{ and } B) = 0.2$
 - $P(A) = 0.5, P(B) = 0.5, P(A \text{ and } B) = 0.0$
16. A personal manager selects an applicant at random from a large group for an interview. The probability of the applicant being male is 0.60. The probability of selecting an

adult is 0.70. The probability of selecting an adult male is 0.45. Given that a male is selected, the probability that he is an adult is;

- (a) 0.27 (b) 0.42
- (c) 0.64 (d) 0.75

17. Which of the following is collection of all mutually exclusive events representing a card randomly selected from a deck of ordinary playing cards?

- (a) King, Queen, Face.
- (b) Heart, Diamond, Black, Red.
- (c) 10, 7, Jack. (d) 10, Red.

18. Which of the following are collectively exhaustive event representing a card randomly selected from a deck of ordinary playing cards?

- (a) Club, Spade, Heart, Diamond
- (b) 7 of Spades, Spade, Club Red
- (c) Face, 7, 9, 10 Jack
- (d) Red, Spades

19. A conditional probability might be found in which of the following way?

- (a) Multiplying together two conditional probabilities.
- (b) Dividing a joint probability by the given event's probability.
- (c) Applying the basic concepts of probability to the portion of the event space for which the condition holds.
- (d) Finding the run frequency of times that the event in question occurs out of all those times when the given event occurs.

20. Indicate in which one of the following situations the events A and B are independent:

- (a) $P(A) = 0.6$; $P(B) = 0.3$; $P(A/B) = 0.6$
- (b) $P(A) = 0.3$; $P(B) = 0.7$; $P(B/A) = 0.3$
- (c) $P(A) = 0.3$; $P(B) = 0.3$; $P(A)$ and $(B) = 0.2$

- (d) A and B are mutually exclusive; $P(A) = 0.1$; $P(B) = 0.2$

21. Which one of the following statements is false?

- (a) $P(A/B) = 0.3$, since A and B are independent and $P(A) = 0.3$
- (b) $P(A/B) = 0.3$, since A and B are mutually exclusive.
- (c) $P(B/A) = 0.4$, since A and B are independent and $P(B) = 0.4$
- (d) $P(A/B) = 0$, since $P(A$ and $B) = 0$ and $P(B) = 0.7$

22. A marginal probability might be found by any but which one of the following?

- (a) Adding together appropriate joint probabilities.
- (b) Subtracting or the sum of several marginal probabilities from 1.
- (c) Dividing the size of the appropriate event set by the number of possible equally likely elementary events.
- (d) Multiplying together all probabilities in the same column or row.

23. Which one of the following statement is not true?

- (a) Mutually exclusive events are statistically dependent.
- (b) Complementary events have probabilities that sum to 1.
- (c) Opposite events are statistically independent.
- (d) An experiment's elementary events are collectively exhaustive and mutually exclusive.

24. The number of ways to select 2 persons from 6, ignoring order of selection;

- (a) 64 (b) 15
- (c) 36 (d) 12

25. A fair coin is tossed 50 times, the expected number of heads are:

- (a) 100 (b) 50
 (c) 15 (d) None of these
26. Which of the following could never be described by the binomial distribution?
 (a) The number of defective items produced by an assembly process.
 (b) The amount of water used daily by a single household.
 (c) The number of people in a class who can answer a particular question correctly.
 (d) All of these.
27. Standard deviation of the binomial distribution depends upon:
 (a) Probability of success
 (b) Number of trials
 (c) Both (a) & (b) above
28. For a Poisson distribution with standard deviation equals to 2 then mean of the Poisson distribution equals to;
 (a) 0 (b) 1
 (c) 2 (d) 4
29. A binomial distribution with $n = 1000$ and $p = 0.5$ is:
 (a) Symmetrical
 (b) Asymmetrical
 (c) Skewed to right
 (d) Skewed to left
30. If X has binomial distribution with parameter p and n then X/n has the variance:
 (a) npq (b) n^2pq
 (c) pq/n (d) pq/n^2
31. If X is number of trials for negative binomial distribution with parameters p and k then its minimum value is:
 (a) 0 (b) k
 (c) $k + 1$ (d) $k - 1$
32. For a given binomial distribution with n fixed if $p = 0.5$ then:
 (a) Poisson distribution will provide a bad approximation.
 (b) Poisson distribution will provide a good approximation.
33. Binomial distribution will be skewed left.
 (c) Binomial distribution will be skewed right.
 34. Which of the following is necessary condition for use of a Poisson distribution:
 (a) Probability of one arrival per second is constant.
 (b) The number of arrivals in any one second interval is independent of arrivals in other intervals.
 (c) The probability of two or more arrivals in the same second is zero.
 (d) (b) and (c) above
35. The necessary and sufficient condition of the hyper geometric distribution is:
 (a) Sampling with replacement
 (b) Sampling without replacement
 (c) Trials are independent
 (d) Probability of success remains constant
36. Which of the following is the most reasonable condition for the binomial approximation to the hyper geometric distribution?
 (a) $N = 200, n = 12$
 (b) $N = 500, n = 20$
 (c) $N = 640, n = 30$
 (d) $N = 800, n = 50$
37. Suppose, we have a Poisson distribution with λ equals to 2 then the probability of having exactly 10 occurrences is:
 (a) $\frac{2^{10} e^{-10}}{10!}$ (b) $\frac{2^{10} e^{-2}}{2!}$
 (c) $\frac{10^2 e^{-10}}{10!}$ (d) $\frac{2^{10} e^{-2}}{10!}$
38. Which of the following is a characteristic of the probability distribution for any random variable?
 (a) A probability is provided for every possible value

- (b) The sum of all probabilities is one
 (c) No given probability occurs more than once
 (d) (a) and (b)
38. In what case would the Poisson distribution be a good approximation of the binomial distribution?
 (a) $n = 40, p = 0.32$
 (b) $n = 40, q = 0.79$
 (c) $n = 200, q = 0.98$
 (d) $n = 10, p = 0.03$
39. The mode of the geometric distribution is:
 (a) 1 (b) 2
 (c) 3 (d) Not possible
40. A binomial distribution may be approximated by a poison distribution of:
 (a) n is large and p is large
 (b) n is small and p is large
 (c) n is small and p is small
 (d) None of these
41. A continuous random variable is a random variable that can:
 (a) Assess only countable values.
 (b) Assess any value in one or more intervals.
 (c) Have no random sample.
 (d) Assume no continuous random frequency.
42. For a continuous random variable the area under the probability distribution curve between any two points is always:
 (a) Greater than one
 (b) Less than zero
 (c) Equal to one
 (d) In the range zero and one
43. The probability that a continuous random variable assumes a single value is:
 (a) Less than one
 (b) Greater than zero
 (c) Equal to zero
 (d) Between zero and one
44. For a continuous random variable X , the total probability of the mutually exclusive events (intervals) within which X can assume a value is:
 (a) Less than one
 (b) Greater than one
 (c) Equal to one
 (d) Between zero and one
45. If X is a uniform variate $U(5, 10)$, then the mean of X is:
 (a) 5 (b) 7.5
 (c) 10 (d) 15
46. If X is a uniform variate $U(5, 10)$, then the variance of X is:
 (a) 0.417 (b) 2.08
 (c) 7.5 (d) 5
47. If mean of exponential distribution is 2 then its variance is:
 (a) 2 (b) 1
 (c) 6 (d) 4
48. If mean of exponential distribution is 2 then sum of such 10 independent variates will follow gamma distribution with mean:
 (a) 2 (b) 10
 (c) 5 (d) 20
49. If mean of exponential distribution is 2 then sum of such 10 independent variates will follow gamma distribution with variance:
 (a) 2 (b) 10
 (c) 20 (d) 200
50. If $X \sim N(\mu, \sigma^2)$ and a and b are real numbers, then mean of $(aX + b)$ is:
 (a) $a+b$ (b) $a\mu + b$
 (c) $a\mu$ (d) $a + b\mu$
51. If $X \sim N(\mu, \sigma^2)$ and a and b are real numbers, then variance of $(aX + b)$ is:
 (a) $a+b$ (b) $a^2\sigma^2 + b^2$
 (c) $a^2\sigma^2$ (d) $a + b\sigma^2$
52. Which of the following is not a characteristic of normal distribution?
 (a) The total area under the curve is equal to one.
 (b) The curve is symmetric about the mean.

- Regression.
- (d) None of above
65. The output of a certain chemical-processing machine is linearly related to temperature. At -10°C the processor output is 200 Kgs. per hour and at 40°C the output is 220 Kgs. per hour. Calculate the linear equation for Kgs. per hour of output (Y) as a function of temperature in degree Celsius (X):
- (a) $Y = 193.3 + 0.67X$
 (b) $Y = 204.0 + 0.40X$
 (c) $Y = -290.0 + 1.5X$
 (d) $Y = -510.0 + 2.50X$
66. What information is given by a value of the coefficient of determination?
- (a) Strength of relationship
 (b) Both strength and direction of relationship
 (c) Neither strength nor direction of relationship
 (d) Direction of relationship only
67. For the regression equation $Y = 10 + 2X$, the Y intercept is:
- (a) 10 (b) 2
 (c) 0 (d) -2
68. The correlation coefficient:
- (a) Can be calculated only after regression analysis is performed.
 (b) May be smaller than -1 only when X and Y are inversely
 (c) Equals the positive or negative square root of the coefficient of determination.
 (d) Equals the standard error of the estimate divided by the square root of the sample size
69. If the coefficient of determination is 0.49; the correlation coefficient may be:
- (a) 0.51 (b) 0.49
 (c) 0.24 (d) 0.70
70. The estimated regression line relating the market value of person's stock portfolio to his annual income is $Y =$
- 5,000 + 0.10 X . This means that each additional rupee of income will increase the stock portfolio by:
- (a) Rs.0.50 (b) Rs.1.00
 (c) Rs.0.10 (d) Rs.10.00
71. Which one of the following situations is inconsistent?
- (a) $Y = 500 + 0.01X$, and $r = 0.75$
 (b) $Y = -200 + 0.9X$, and $r = -0.86$
 (c) $Y = 10 + 2X$, and $r = 0.50$
 (d) $Y = -8 - 3X$, and $r = -0.95$
72. Which one of the following statement is true?
- (a) The estimated and the true regression lines are always the same.
 (b) The Y 's must be normally distributed about true regression line before the sample coefficient of determination can be calculated.
 (c) The units in which X and Y are measured will not affect the value of r .
 (d) The correlation coefficient can be calculated only after the estimated regression line has been found.
73. The true correlation coefficient p will be zero only if:
- (a) The Y intercept of the true regression line is equal to zero
 (b) The slope of the true regression line is equal to zero
 (c) $r = 0$ (d) $b = 0$
74. Whenever predictions are made from the estimated regression line, the relation between X and Y is assumed to be:
- (a) Direct (b) Inverse
 (c) Linear (d) Perfect
75. The estimated coefficient of determination is equal to all except which one of the following?
- (a) The square of the correlation coefficient.

- (b) The proportion of variation in Y explained by regression.
 (c) 1 minus the proportion of variation in Y unexplained by regression.
 (d) The slope of the estimated regression line.
76. The coefficient of partial determination differs from the coefficient of multiple determinations in that:
 (a) One provides the slope of the regression plane and the other does not.
 (b) One may be negative, but the other is always positive.
 (c) (a) & (b)
 (d) None of the above.
77. The coefficient of multiple determinations is 0.81. Thus, the multiple correlation coefficients are:
 (a) 0.19 (b) 0.9
 (c) 0.6561 (d) 0.1
78. A larger sample size can be expected to achieve all but which one not of the following?
 (a) A smaller value for standard error of regression.
 (b) Increase degrees of freedom.
 (c) An estimated regression plane that is closer to the true regression plane.
 (d) Increase in the value of coefficient of determination.
79. In multiple linear regression analysis, the square root of Mean Squared Error (MSE) is called the:
 (a) Multiple correlation coefficient
 (b) Standard error of estimate
 (c) Coefficient of determination
 (d) Coefficient of non-determination
80. In multiple regression analysis, the purpose of solving the normal equations is to find:
 (a) The standard error of estimate.
- (b) The constant and coefficients in the least squares relationship.
 (c) The number of independent variables in the least squares relationship.
 (d) The variance around the least squares relationship.
81. Data concerning events over a period of time is called a:
 (a) Time Series
 (b) Moving Average
 (c) Frequency Distribution
 (d) Random Sample
82. Which of the following is not a component of time series?
 (a) Seasonal Variation
 (b) Cyclical Variation
 (c) Variance (d) Trend
83. In a time series, secular variation is:
 (a) A variation that occurs at regular intervals
 (b) The difference between the largest and smallest item in any one-year
 (c) The range of time to which the series applies
 (d) The long-term trend
84. A cyclical variation is:
 (a) One that takes a number of years to complete
 (b) One that goes round in circles
 (c) One that occurs four times a year
 (d) A regular change
85. The number of cars sold by a car dealer during just 6 months in 2003 was as following:
- | January | February |
|---------|----------|
| 18 | 16 |
| March | April |
| 28 | 51 |
| May | June |
| 47 | 55 |
- What are the first 3 monthly moving averages?
 (a) 20.67 (b) 31.67

- (c) 42.00 (d) 51.00
86. A histogram is:
 (a) A frequency graph
 (b) A time series graph
 (c) A graph plotting mean against standard deviation
 (d) A correlative frequency chart
87. The weekly takings in a shop over 5 weeks were as follows:
- | | | | | | |
|--------------|----|-----|-----|-----|-----|
| Week | 1 | 2 | 3 | 4 | 5 |
| Taking (Rs.) | 98 | 112 | 161 | 109 | 101 |
- The first 4 weekly moving averages was:
 (a) Rs. 105.00 (b) Rs. 109.00
 (c) Rs. 120.00 (d) Rs. 120.75
88. The following table shows (in thousands) the number of units of electricity used by a firm over a period of two years:
- | | | | | | | | | |
|-------------------------------|----|----|----|----|----|----|----|----|
| Quarter: | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| No. of units (1000's): | 85 | 49 | 25 | 87 | 89 | 53 | 29 | 86 |
- What is the value of the second 4-quarterly moving average?
 (a) 61.50 thousand
 (b) 62.50 thousand
 (c) 86.50 thousand
 (d) 64.75 thousand
89. Suppose you were considering a time series of data for the quarters of 1992 and 1993. The third quarter of 1993 would be coded as:
 (a) 2 (b) 3
 (c) 5 (d) 6
90. Assume that you have been given quarterly sales data for a five-year period. To use the ratio-to-moving-average method of computing a seasonal index, your first step will be:
 (a) Compute the four-quarter moving average
 (b) Discard highest and lowest value for each quarter
 (c) Calculate the four-quarter moving total
 (d) None of these
91. To measure changes in total monetary worth, one should calculate:
 (a) Price index
 (b) Quantity index
 (c) Value index
 (d) CPI
92. If an index number calculations over 8 years with a base value of 100 gave an index for 2003 of 120, what would be the percentage relative for 2003?
 (a) 100 (b) 120
 (c) 880 (d) 960
93. Which of the following describes an advantage of using the Laspeyres' method?
 (a) Many commonly used quantity measures are not tabulated for every period.
 (b) Changes in consumption patterns are taken into account.
 (c) One index can be easily compared with another.
 (d) (a) and (c) but not (b)
94. When computing a weighted average of relative index, we would be best able to compare indices from various periods if:
 (a) Base values were used as $p_n q_n$
 (b) Current values were used as $p_n q_n$
 (c) Fixed values were used as $p_n q_n$
 (d) Either base or fixed values were used as $p_n q_n$
95. Commodities subject to considerable price variations could best be measured by:
 (a) Price index
 (b) Quantity index
 (c) Value index
 (d) CPI
96. A base period can be described as a normal period if:
 (1) It is neither the peak nor the trough of a fluctuation.
 (2) It must be the most recent period for which we have data.

- (c) There was no inflation or deflation of prices during the period.
 (d) (a) and (c) above
97. The weights used in a quantity index are:
 (a) Percentages of total quantity
 (b) Prices
 (c) Average of quantities
 (d) None of these
98. To measure how much the cost of some variable changes over time, we would use:
 (a) Inflation index
 (b) Quantity index
 (c) Value index
 (d) None of these
99. When the base year values are used as weights, the weighted average of
- relative price index is the same as:
 (a) The Paasche's index
 (b) The Laspeyres' index
 (c) The un-weighted average of relative price index
 (d) None of these
100. A primary difference between average of relatives and aggregate methods is that:
 (a) Aggregate methods sum all prices before finding the ratio.
 (b) Average of relative methods sum all prices before finding the ratio
 (c) Aggregates methods are useful only for price indices
 (d) (a) and (c) but not (b)

Answers

1.	(d)	2.	(d)	3.	(b)	4.	(a)	5.	(a)
6.	(d)	7.	(a)	8.	(d)	9.	(b)	10.	(a)
11.	(d)	12.	(c)	13.	(c)	14.	(d)	15.	(c)
16.	(d)	17.	(c)	18.	(a)	19.	(b)	20.	(a)
21.	(b)	22.	(a)	23.	(c)	23.	(b)	25.	(d)
26.	(b)	27.	(c)	28.	(d)	29.	(a)	30.	(c)
31.	(b)	32.	(a)	33.	(d)	34.	(b)	35.	(d)
36.	(d)	37.	(d)	38.	(c)	39.	(a)	40.	(d)
41.	(b)	42.	(d)	43.	(c)	44.	(c)	45.	(b)
46.	(b)	47.	(d)	48.	(d)	49.	(d)	50.	(b)
51.	(c)	52.	(c)	53.	(c)	54.	(b)	55.	(d)
56.	(b)	57.	(d)	58.	(c)	59.	(b)	60.	(b)
61.	(a)	62.	(c)	63.	(c)	64.	(b)	65.	(b)
66.	(a)	67.	(a)	68.	(c)	69.	(d)	70.	(c)
71.	(b)	72.	(c)	73.	(b)	74.	(c)	75.	(d)
76.	(b)	77.	(b)	78.	(d)	79.	(b)	80.	(b)
81.	(a)	82.	(c)	83.	(d)	84.	(b)	85.	(a)
86.	(a)	87.	(c)	88.	(b)	89.	(c)	90.	(c)
91.	(c)	92.	(b)	93.	(d)	94.	(d)	95.	(b)
96.	(d)	97.	(b)	98.	(d)	99.	(b)	100.	(a)

Model Paper –2

Written test for Recruitment to the Posts of Lecturer/Subject Specialist, Statistics (BS-17) Male /Female in the Education Department

Time Allowed: 2 Hour

Maximum Marks: 100

Note:

- (i) All answers are required to be marked on the answer sheet and NOT on this question paper.
- (ii) All questions carry equal marks.
- (iii) Use of Mobile is not allowed.
- (iv) Use of Calculator is not allowed.

<p>1. In the singular sense, statistics means:</p> <ul style="list-style-type: none"> (a) Numerical data (b) Population values (c) Methodology (d) Grouped data <p>2. The word statistics derived from:</p> <ul style="list-style-type: none"> (a) German word (b) Latin word (c) Australian word (d) Russian word <p>3. In the plural sense, statistics means:</p> <ul style="list-style-type: none"> (a) Data (b) Methods (c) Observations (d) None of these <p>4. The word statistics is the plural of:</p> <ul style="list-style-type: none"> (a) Statistik (b) Statistic (c) Static (d) None of these <p>5. The word statistic was first used by:</p> <ul style="list-style-type: none"> (a) Fisher (b) Pearson (c) Bowley (d) Gottfried Achenwall <p>6. Statistics are aggregates of:</p> <ul style="list-style-type: none"> (a) Methods (b) Calculations (c) Facts (d) Data <p>7. Statistics laws are true:</p> <ul style="list-style-type: none"> (a) In the short run (b) On the average (c) In every case (d) None of these <p>8. Statistics are the eyes of:</p> <ul style="list-style-type: none"> (a) Mathematics (b) Physics (c) Administration (d) Banking <p>9. The oldest branch of statistical study is:</p> <ul style="list-style-type: none"> (a) Chemistry (b) Biology (c) Meteorology 	<p>10. (d) Astronomy Statistics are collected in</p> <ul style="list-style-type: none"> (a) Systematic way (b) Unsystematic way (c) Haphazard way (d) None of these <p>11. The first hand information is known as:</p> <ul style="list-style-type: none"> (a) Primary data (b) Grouped data (c) Secondary data (d) Quantitative data <p>12. Data in the population census refolds are:</p> <ul style="list-style-type: none"> (a) Grouped data (b) Primary data (c) Secondary data (d) None of these <p>13. Publications of Federal Bureau of statistics are:</p> <ul style="list-style-type: none"> (a) Primary data (b) Grouped data (c) Qualitative data (d) Secondary data <p>14. A quantity which can vary from one individual to another is called:</p> <ul style="list-style-type: none"> (a) Constant (b) Variable (c) Data (d) None of these <p>15. A variable which can assume each and every value within a given range is called:</p> <ul style="list-style-type: none"> (a) Discrete variable (b) Random variable (c) Qualitative variable (d) Continuous Variable <p>16. A variable does not take numerical value is known as:</p> <ul style="list-style-type: none"> (a) Qualitative variable (b) Random variable
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- (c) Quantitative variable
 (d) None of these
17. The number of students in a class represents:
 (a) Continuous data
 (b) Grouped data
 (c) Discrete data
 (d) Primary data
18. The life time of a car tyre is:
 (a) Continuous variable
 (b) Discrete variable
 (c) Random variable
 (d) Qualitative variable
19. Height measurements of 50 students studying in a college:
 (a) Discrete variable
 (b) Random variable
 (c) Constant
 (d) Continuous variable
20. Religion of the people of a country is:
 (a) Qualitative variable
 (b) Quantitative variable
 (c) Continuous variable
 (d) None of these
21. A characteristic which cannot be measurable is called:
 (a) A variable (b) A constant
 (c) A parameter
 (d) An attribute
22. The number 115.9700 rounded off to nearest tenth (one decimal place) is:
 (a) 115.9 (b) 115
 (c) 116.0 (d) None of these
23. The number 7.036823 rounded off to nearest thousand the (three decimal place) is:
 (a) 7.036 (b) 7.063
 (c) 7.000 (d) 7.034
24. $\sum X_i =$
 $i = I$
 (a) $x_1 + x_2 + x_3 + x_4 + x_5$
 (b) $x_1 \times x_2 \times x_3 \times x_4$
 (c) $x_1 + x_2 + x_3 + x_4$
 (d) $x_1 - x_2 - x_3 - x_4$
25. A single value which represents the whole set of data is:
 (a) Three or more
 (b) Similar characteristic
 (c) Dissimilar characteristic
26. (d) Node of these
 The important bases of classification of data are:
 (a) Five (b) Two
 (c) Three (d) Four
27. Data classified by geographical regions is called:
 (a) Geographical data
 (b) Qualitative data
 (c) Chronological data
 (d) None of these
28. Data classified by attributes are called:
 (a) Qualitative data
 (b) Quantitative data
 (c) Ungrouped data
 (d) Geographical data
29. Data classified by time of their occurrence is called:
 (a) Quantitative data
 (b) Grouped data
 (c) Array data
 (d) Chronological data
30. Data classified by two characteristics at a time are called:
 (a) One way classification
 (b) Many way classification
 (c) Two way classification
 (d) None of these
31. Data arranged in ascending or descending order is called:
 (a) Grouped data
 (b) Arrayed data
 (c) Quantitative data
 (d) Ungrouped data
32. The process of arranging data into rows and columns is called:
 (a) Classification
 (b) Ogive
 (c) Qualitative data
 (d) Tabulation
33. How many classes are generally used for arranging data:
 (a) More than 10
 (b) More than 20
 (c) Between 5 and 15
 (d) Less than 8
34. The portion of the table containing row captions is called:
 (a) Title (b) Stub

- (c) Column captions
(d) Box head
35. The portion of the table containing column caption is called:
(a) Stub (b) Body
(c) Title (d) Box head
36. Title of a table should be in:
(a) Small letters
(b) Ten letters
(c) Capital letters
(d) None of these
37. The difference between the upper and lower class boundary is called:
(a) Class interval
(b) Class limit
(c) Frequency distribution
(d) Array
38. Class Mark is also called:
(a) Class boundary
(b) Ogive
(c) Mid point (d) None of these
39. The frequency of the class divided by the total frequency is called:
(a) Cumulative frequency
(b) Relative frequency
(c) Ogive
(d) Frequency polygon
40. A graph of the cumulative frequency distribution is called:
(a) Histogram
(b) Frequency distribution
(c) Ogive (d) None of these
41. The frequency distribution involves two variable at a time is called:
(a) Univariate frequency distribution
(b) Cumulative frequency distribution
(c) Bivariate frequency distribution
(d) Relative frequency distribution
42. Cumulative frequency is:
(a) Decreasing (b) Increasing
(c) Different (d) None of these
43. A Histogram containing a set of:
(a) Adjacent rectangles
(b) Non adjacent rectangles
(c) Adjacent squares
(d) Adjacent triangles
44. Which of the following is example of compressed data?
(a) Histogram
(b) Ungrouped data
(c) Frequency distribution
(d) Tabulation
45. Which of the following statement is true for nulative frequency polygon?
(a) Less than curve slope down and to the right
(b) Less than curve slope up and to the right
(c) Less than curve slop up and to the left
(d) None of these
46. A frequency Polygon is a closed figure of:
(a) Two sided (b) Three sided
(c) Many sides (d) None of these
47. A frequency curve touches x-axis:
(a) Yes (b) No
(c) Some times (d) None of these
48. Frequency curve is:
(a) Asymptotic to y-axis
(b) Non-asymptotic to y-axis
(c) Asymptotic to x-axis
(d) None of these
49. Decumulative frequency is presented by:
(a) More than ogive
(b) Less than ogive
(c) Equal to ogive
(d) None of these
50. For geographically base data, the bars are used:
(a) Vertical (b) Zig zag
(c) Horizontal (d) None of these
51. Component bar charts are used when data is divided into:
(a) Parts (b) Groups
(c) Circles (d) None of these
52. In a Pie chart the arrangement of the sectors is:
(a) Clockwise (b) Pair wise
(c) Anti clockwise
(d) None of these
53. In a Pie Chart calculate the angles for each sector by the formula:

- (a) $\frac{\text{Component Part}}{\text{Total}} \times 100$
- (b) $\frac{\text{Component Part}}{\text{Total}} \times \pi$
- (c) $\frac{\text{Total}}{\text{Component Part}} \times 360^\circ$
- (d) $\frac{\text{Component Part}}{\text{Total}} \times 360^\circ$
54. A circle in which sectors represents various quantities is called:
 (a) Histogram
 (b) Frequency Polygon
 (c) Pie Chart
 (d) Component Bar Chart
55. A single value which represents the whole set or data is called:
 (a) Tabulation (b) Classification
 (c) Average (d) Uni Variate
56. The average is also called measures of:
 (a) Tabulation
 (b) Central Tendency
 (c) Classification
 (d) None of these
57. One of the type of averages is:
 (a) Mode (b) Classification
 (c) Tabulation (d) None of these
58. The most central value of an array is called:
 (a) Mode (b) Medium
 (c) Harmonic Mean
 (d) Geometric Mean
59. In case of open – end frequency table, which average cannot be computed accurately:
 (a) G.M (b) Median
 (c) Mode (d) AM
60. One of the type of averages is:
 (a) Classification
 (b) Harmonic Mean
 (c) Tabulation (d) None of these
61. The value obtained by dividing the sum of the values by their number is called:
 (a) Mode
 (b) Geometric Mean
 (c) Harmonic Mean
62. (d) Arithmetic Mean
 The arithmetic mean of 5, 9, 12, 15, is:
 (a) 10.50 (b) 10.20
 (c) 10.25 (d) 9.25
63. The arithmetic mean of 112, 120, 135, 150, 157 is:
 (a) 130.6 (b) 134.8
 (c) 133.8 (d) 135.8
64. The appropriate average for calculating average percentage increase in population is:
 (a) Arithmetic Mean
 (b) Harmonic Mean
 (c) Mode
 (d) Geometric Mean
65. The arithmetic mean is affected by:
 (a) Change of scale
 (b) Change of origin
 (c) Change of mind
 (d) Change of origin and scale
66. The weights used in a quantity index are:
 (a) Percentage of total quantities
 (b) Price
 (c) Average of quantities
 (d) None of these
67. Sum of deviations of the values from their means is:
 (a) Two (b) Zero
 (c) One (d) None of these
68. If $x = 8$ and $y = 3x + 6$ then $y =$
 (a) 25 (b) 27
 (c) 32 (d) 30
69. Sum of squares of deviations of the values is least when deviations are taken from:
 (a) Mode (b) Median
 (c) G.M
 (d) Arithmetic Mean
70. If mean is greater than Mode, the distribution is:
 (a) Symmetrical
 (b) Negatively Skewed
 (c) Positively Skewed
 (d) None of these
71. If $\sum (x - 12) = 0$ then $x =$
 (2) 10 (b) 12
 (c) 8 (d) None of these

72. To measure how much the cost of some variable changes over time, you would used:
 (a) A value index
 (b) An inflation index
 (c) A quantity index
 (d) All of these
73. Sum of absolute deviations of the values is least when deviations are taken from:
 (a) Median (b) Mode
 (c) Geometric Mean
 (d) Mean
74. The most central value of an arrayed set of data is:
 (a) Mean (b) Mode
 (c) Median (d) H.M.
75. Coding method is used for calculating:
 (a) Mode (b) A.M.
 (c) G.M (d) Median
76. The relation between A.M. G.M. and H.M. is:
 (a) $G.M \leq A.M \leq H.M$
 (b) $H.M. \geq G.M \geq A.M$
 (c) $A.M \geq G.M \geq H.M$
 (d) $A.M. \geq H.M. \geq G.M$
77. If the frequency curve has longer tail to left, the distribution is:
 (a) Negatively Skewed
 (b) Positively Skewed
 (c) Symmetrical
 (d) None of these
78. If 4 is added to all observations in the data then mean is increased by:
 (a) 8 (b) 4
 (c) 2 (d) 12
79. If 6 is multiple to all observations in the data the mean is multiplied by:
 (a) 18 (b) 3
 (c) 6 (d) 12
80. In a symmetrical distribution the mean is 25. What is the value of median?
 (a) 50 (b) 75
 (c) 100 (d) 25
81. If $x = 3$ then which of the following is minimum
 (a) $\sum(x - 3)^2$ (b) $\sum(x - 6)^2$
 (c) $\sum(x - 13)^2$ (d) $\sum(x - 5)^2$
82. The first step in calculating the median is:
 (a) Determine the relative frequency
 (b) Subtraction of two middle values
 (c) Arrange the data
 (d) None of these
83. If any value of in the date is zero then it is not possible to compute:
 (a) Arithmetic Mean
 (b) Harmonic Mean
 (c) Median (d) Mode
84. The suitable average for the qualitative data is:
 (a) Median (b) Mode
 (c) Harmonic Mean
 (d) G.M
85. Mode of values 4, 5, 6, 8, 5, 10, 12 is
 (a) 8 (b) 4
 (c) 5 (d) 6
86. Mode of the values 2, 6, 8, 6, 12, 15, 18, 8, 16 is:
 (a) 18 (b) 6
 (c) 8 (d) 6 and 8
87. Mode of the values 3, 5, 8, 10, 12 is:
 (a) 8 (b) 5
 (c) 12 (d) None of these
88. When Mean, Median and Mode are identical, the distribution is:
 (a) Positively Skewed
 (b) Symmetrical
 (c) Negatively Skewed
 (d) Bivariate
89. If any value in the data is negative it is not possible to calculate:
 (a) A.M (b) H.M
 (c) Median (d) G.M
90. If $x = 50 + 2\mu$ $\sum u = 40$ $n = 20$ what is A.M.
 (a). 50 (b) 55
 (c) 54 (d) 58
91. The harmonic mean of two numbers a and b is:
 (a) $\frac{a+b}{2}$ (b) $\frac{a+b}{2ab}$
 (c) $\frac{a-b}{2}$ (d) $\frac{2ab}{a+b}$
92. Lower quartile is equal to the:
 (a) 30th decile (b) 25th decile

- (c) 25th percentile
 (d) 50th percentile
93. If mean = 35 Median = 32 what is Mode?
 (a) 36 (b) 26
 (c) 30 (d) 35
94. The appropriate average for shoe sizes is
 (a) Mode (b) Median
 (c) A.M (d) G.M
95. Which of the following is an absolute measure of dispersion?
 (a) Mode
 (b) Mean Deviation
 (c) Median (d) None of these
96. Which of the following is a relative measure of dispersion?
 (a) Variance
 (b) Quartile deviation
 (c) Mode
 (d) Coefficient of variation
97. The most important measure of dispersion is:
 (a) Quartile Deviation
- (b) Median
 (c) Standard deviation
 (d) Range
98. The difference between the largest and smallest value in data is called:
 (a) Range
 (b) Quartile Deviation
 (c) Median
 (d) Mean Deviation
99. The half of the difference between the third and first quartiles is called:
 (a) Range
 (b) Standard deviation
 (c) Quartile deviation
 (d) Variance
100. The dispersion expressed in the form of a ratio or coefficient and independent from units of measurement is called:
 (a) Measures of location
 (b) Relative dispersion
 (c) Absolute dispersion
 (d) None of these

Answers

1.	(c)	2.	(b)	3.	(a)	4.	(b)	5.	(d)
6.	(c)	7.	(b)	8.	(c)	9.	(d)	10.	(a)
11.	(a)	12.	(b)	13.	(d)	14.	(b)	15.	(d)
16.	(a)	17.	(c)	18.	(a)	19.	(d)	20.	(a)
21.	(d)	22.	(c)	23.	(d)	24.	(c)	25.	(b)
26.	(d)	27.	(a)	28.	(a)	29.	(d)	30.	(c)
31.	(b)	32.	(d)	33.	(c)	34.	(b)	35.	(d)
36.	(c)	37.	(a)	38.	(c)	39.	(b)	40.	(c)
41.	(c)	42.	(b)	43.	(a)	44.	(c)	45.	(b)
46.	(c)	47.	(b)	48.	(c)	49.	(b)	50.	(c)
51.	(b)	52.	(c)	53.	(d)	54.	(c)	55.	(c)
56.	(b)	57.	(a)	58.	(b)	59.	(d)	60.	(b)
61.	(d)	62.	(c)	63.	(b)	64.	(d)	65.	(d)
66.	(a)	67.	(b)	68.	(d)	69.	(d)	70.	(c)
71.	(b)	72.	(d)	73.	(a)	74.	(c)	75.	(b)
76.	(c)	77.	(a)	78.	(b)	79.	(c)	80.	(d)
81.	(a)	82.	(c)	83.	(b)	84.	(a)	85.	(c)
86.	(d)	87.	(d)	88.	(b)	89.	(d)	90.	(c)
91.	(d)	92.	(c)	93.	(b)	94.	(a)	95.	(b)
96.	(d)	97.	(c)	98.	(a)	99.	(c)	100.	(b)

Model Paper – 3

Written test for Recruitment to the Posts of Lecturer/Subject Specialist, Statistics (BS-17) Male /Female in the Education Department

Time Allowed: 2 Hour.

Maximum Marks: 100

Note:

- (i) All answers are required to be marked on the answer sheet and NOT on this question paper.
- (ii) All questions carry equal marks.
- (iii) Use of Mobile is not allowed.
- (iv) Used of Calculator is not allowed.

1. The sum of absolute deviations is minimum if these deviations are taken from:

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

2. The measures of dispersion remain unchanged by the change of:

- (a) Scale (b) Units
- (c) Origin (d) Constant

3. The square root of the variance is called:

- (a) Median
- (b) Standard Deviation
- (c) Mean Deviation
- (d) Quartile Deviation

4. The square root of standard deviation is:

- (a) Mean Deviation
- (b) Variance
- (c) Quartile Deviation
- (d) None of these

5. The measures of dispersion are changed by the change of:

- (a) Scale (b) Origin
- (c) Unit (d) None of these

6. Standard deviation of a constant is:

- (a) One (b) Zero
- (c) Constant (d) Variable

7. $\text{Var}(2x + 5) =$

- (a) $\text{Var}(2x)$ (b) $2 \text{Var}(x)$
- (c) $4 \text{Var}(x)$ (d) $4 \text{Var}(x) + 5$

8. $\text{Var}(x + 4) =$

- (a) $\text{Var}(x) + \text{var}(4)$
- (b) $\text{Var}(x)$
- (c) $\text{Var}(4)$ (d) None of these

9. $\text{Var}(x)[x/3] =$

- | | |
|--|--|
| <p>10. The standard deviation is independent change of:</p> | <ul style="list-style-type: none"> (a) $1/9 \text{var}(x)$ (b) $1/3 \text{var}(x)$ (c) $1/6 \text{var}(x)$ (d) None of these |
| <p>11. In Skewed distribution, approximately 95% of cases are falling between:</p> | <ul style="list-style-type: none"> (a) $\bar{x} \pm S$, (b) $x \pm 2S$ (c) $x \pm 3S$ (d) None of these |
| <p>12. If $\text{Var}(x) = 4$ then $\text{Var}(3x + 5)$ is equal to:</p> | <ul style="list-style-type: none"> (a) 12 (b) 17 (c) 18 (d) 36 |
| <p>13. If $S.D(x) = 3$ then $S.D[6x + 4/6]$ is equal to:</p> | <ul style="list-style-type: none"> (a) 3 (b) 6 (c) 18 (d) 12 |
| <p>14. If $x = 8$ which of the following is a minimum:</p> | <ul style="list-style-type: none"> (a) $\sum(x - 64)^2$ (b) $\sum(x - 8)^2$ (c) $\sum x - 64$ (d) $\sum x - 8$ |
| <p>15. If x and y are independent then $\text{var}(x - y)$ is:</p> | <ul style="list-style-type: none"> (a) $\text{Var}(x) - \text{Var}(y)$ (b) $\text{Var}(x), \text{Var}(y)$ (c) $\text{Var}(x) + \text{Var}(y)$ (d) None of these |
| <p>16. The standard deviation of the values 5, 5, 5, 5, 5 is equal to:</p> | <ul style="list-style-type: none"> (a) 5 (b) 25 (c) 10 (d) Zero |
| <p>17. $\text{Var}(3x - 4y) =$</p> | <ul style="list-style-type: none"> (a) $3 \text{Var}(x) - 4 \text{Var}(y)$ (b) $9 \text{Var}(x) + 16 \text{Var}(y)$ |

- (c) $9 \text{Var}(x) - 16 \text{Var}(y)$
 (d) $\text{Var}(3x) - \text{Var}(4y)$
18. $x = 40$ and $S^2 = 64$ then the coefficient of variation is:
 (a) 25% (b) 40%
 (c) 160% (d) 20%
19. The second moment about mean is:
 (a) Variance (b) S.D
 (c) Zero (d) 1
20. If the third moment about mean is zero, the distribution is:
 (a) Positively skewed
 (b) Negatively skewed
 (c) Symmetrical
 (d) None of these
21. The first moment about mean is:
 (a) 1 (b) 2
 (c) 3 (d) Zero
22. If $b_2 = 3$ then the distribution are:
 (a) Negatively Skewed
 (b) Mesokurtic
 (c) Platykurtic
 (d) Leptokurtic.
23. For moderately skewed distribution, the empirical formula holds:
 (a) $M.D = 2/3 S.D$
 (b) $M.D = 3/4 S.D$
 (c) $M.D = 4/5 S.D$
 (d) None of these
24. If $b_2 > 3$ the distribution is:
 (a) Leptokurtic (b) Platykurtic
 (c) Mesokurtic (d) Symmetrical
25. The index number for the base year is equal to:
 (a) 200 (b) 100
 (c) 10 (d) None of these
26. An index number can serve many purposes is called:
 (a) Simple index number
 (b) Special purpose index
 (c) General purpose index
 (d) None of these
27. The index numbers are used to measure the changes in price of commodities is called:
 (a) Price index number
- (b) Quantity index number
 (c) Consumer's price index numbers.
 (d) None of these
28. Consumer's price index numbers are calculated by:
 (a) Fisher's formula
 (b) Paasche's formula
 (c) Palgrave's formula
 (d) Laspeyre's formula
29. The variation in two or more variables studies by the index is called:
 (a) Composite index
 (b) Simple index
 (c) Price index (d) None of these
30. How many steps involved in the construction of index number of prices:
 (a) Five (b) Four
 (c) Six (d) Three
31. The all values of equal importance are used in calculating an index, the index is called:
 (a) Simple (b) Composite
 (c) Weighted (d) Unweighted
32. The basic types of index numbers are:
 (a) Six (b) Five
 (c) Three (d) Two
33. The weights used in a quantity index are:
 (a) Prices (b) Quantities
 (c) Value (d) None of these
34. A relative obtained by dividing the price in a given year by price in base year and expressed as percentage is called:
 (a) Link relatives
 (b) Price relatives
 (c) Volume index
 (d) None of these
35. A relative obtained by dividing the price in a given year by price in proceeding year and expressed as percentage is called:
 (a) Price relatives
 (b) Volume relative
 (c) Link relatives

- (d) None of these
 36. In simple price index numbers, the base period is:
 (a) Changed (b) Fixed
 (c) Constant (d) None of these
37. In chain base method the base period is:
 (a) Changed (b) Fixed
 (c) Constant (d) None of these
38. For calculating weighted index numbers, which of the following method useful quantities consumed in base period as weight:
 (a) Fisher method
 (b) Paasche's method
 (c) Palgrave's method
 (d) Lesbeyre's method
39. $P_{0n} = \frac{\sum P_n q_n}{\sum P_0 q_n} \times 100$ is the formula of:
 (a) Lesbeyre's index number
 (b) Paasche's index number
 (c) Fisher's index number
 (d) None of these
40. Time reversal test is satisfied by:
 (a) Paasche's index
 (b) Lesbeyre's idnex
 (c) Fisher's index
 (d) None of these
41. Circular test is satisfied by:
 (a) Fisher's index
 (b) Lesbeyre's index
 (c) Paasche's index
 (d) None of these
42. Which is the most suitable average in chain indices?
 (a) A.M (b) G.M
 (c) Median (d) Mode
43. Which of the following indices has a downward bias?
 (a) Paasche's index
 (b) Fisher's Index
 (c) Laspeyres's index
 (d) Marshall-Edge-worth index
44. The consumer price index number is also known:
 (a) The wholesale price index
- (b) The weighted Index
 45. (c) The cost of living index
 (d) None of these
- The collection of well defined elements is called a:
 (a) Natural number
 (b) Set
 (c) Real number
 (d) None of these
46. A null set having:
 (a) Two elements
 (b) One element
 (c) No element
 (d) Three elements
- ϕ is known as:
 (a) Sample space
 (b) Union of sets
 (c) Complimentary set
 (d) Empty set
48. If $A = \{1, 2, 3, 4, 5, 6\}$ then:
 (a) $4 \notin A$ (b) $4 \in A$
 (c) $8 \in A$ (d) None of these
49. Set 'A' is said to be subset of a set 'B' if:
 (a) Each element of 'A' is also an element of B
 (b) Each element of 'B' is also an element of A
 (c) If no element of 'A' is also an element of B
 (d) None of these
50. Two sets A and B are said to be disjoint sets if $A \cap B = \emptyset$
 (a) B (b) A
 (c) 1 (d) ϕ
51. Two sets A and B are said to be overlapping sets if:
 (a) $A \cap B = \emptyset$ (b) $A \cup B = \emptyset$
 (c) $A \cap B \neq \emptyset$ (d) None of these
52. If $A = \{1, 4, 6\}$ and $B = \{2, 3, 4\}$ then $A \cup B =$
 (a) $\{1, 2, 3, 4, 5, 6\}$
 (b) $\{1, 2, 3, 4, 6\}$
 (c) $\{1, 2, 3, 4\}$
 (d) None of these

53. If $A = \{1, 4, 6\}$ and $B = \{2, 3, 4, 6\}$ then $A \cap B =$
 (a) $\{4, 6\}$ (b) $\{2, 4, 6\}$
 (c) \emptyset (d) None of these
54. If $A = \{2, 3, 4\}$ and $B = \{4, 5, 6\}$ then AB are:
 (a) Equal sets (b) Disjoint sets
 (c) Overlapping sets
 (d) None of these
55. If $A = \{2, 3, 4\}$ and $B = \{5, 6\}$
 (a) Overlapping sets
 (b) Equal sets
 (c) Union sets (d) Disjoint sets
56. If $A = \{2, 3, 4\}$ and $B = \{1, 2, 3, 4, 5, 6\}$ then:
 (a) $A = B$ (b) $B \subseteq A$
 (c) $A \subset B$ (d) None of these
57. If $A = \{2, 4, 6\}$ and $U = \{1, 2, 3, 4, 5, 6\}$ then $A' =$
 (a) $\{1, 3, 5\}$ (b) $\{2, 4, 6\}$
 (c) \emptyset (d) None of these
58. If $A = \{1, 2, 3, 4\}$ and $B = \{4, 5, 6\}$ then $A \cup B =$
 (a) $\{1, 2, 3, 4, 5, 6\}$
 (b) $\{1, 2, 3, 4, 5, 6\}$
 (c) $\{1, 2, 3, 4\}$
 (d) None of these
59. $n! =$
 (a) $n(n-2)!$ (b) $n(n-1)!$
 (c) $n(n+1)!$ (d) None of these
60. An arrangement of all or some of a set of objects in a definite order is called:
 (a) Combination
 (b) Binomial expression
 (c) Permutation
 (d) None of these
61. An arrangement of objects without caring for the order is called:
 (a) Combination
 (b) Permutation
 (c) Factorial (d) None of these
62. ${}^n P_r =$
 (a) $\frac{n!}{r!(n-r)!}$ (b) $\frac{n!}{(n-r)!}$

- (c) $\frac{(n-r)!}{n}$
 (d) None of these
63. ${}^n C_r =$
 (a) $\frac{n!}{(n-r)!}$ (b) $\frac{(n-r)!}{n!}$
 (c) $\frac{n!}{r!(n-r)!}$
 (d) None of these
64. In how many ways a team of 6 players be chosen from 11 persons:
 (a) 332640 (b) 520
 (c) 790 (d) 462
65. How many terms in the expansion of the $(q + p)^n$?
 (a) $(n + 1)$ (b) $(n - 1)$
 (c) n (d) $(n + 2)$
66. ${}^{10} C_5 =$
 (a) 225 (b) 256
 (c) 30240 (d) 252
67. The collection of all possible outcomes of an experiment is called:
 (a) Event (b) Small Space
 (c) Trial (d) None of these
68. The subset of a sample space is called:
 (a) Probability (b) Trial
 (c) Event (d) None of these
69. An event consists of one sample point is called:
 (a) Compound event
 (b) Simple event
 (c) Sample space
 (d) None of these
70. An event consists of more than one sample point is called:
 (a) Compound event
 (b) Sample space
 (c) Simple event
 (d) None of these
71. If the two events cannot occur at the same time called:
 (a) Dependent events
 (b) Equally likely events
 (c) Mutually exclusive events
 (d) None of these

72. Events having equal chance of occurrence is called:
 (a) Independent events
 (b) Mutually exclusive events
 (c) Exhaustive events
 (d) Equally likely events
73. When the occurrence of an event does not effects the probability of occurrence of another event is called:
 (a) Dependent events
 (b) Mutually exclusive events
 (c) Independent events
 (d) Exhaustive events
74. When the occurrence of an event does effect the probability of occurrence of an other event is called:
 (a) Independent events
 (b) Dependent events
 (c) Equally likely events
 (d) None of these
75. The probability of the occurrence of the event 'A' is $P(A) =$
 (a) $\frac{n}{m}$ (b) mm
 (c) $\frac{m}{n}$
 (d) None of these
76. The probability of a sample space is equal to:
 (a) 2 (b) 0
 (c) 3 (d) 1
77. If three coins are tossed, the all possible cases are:
 (a) 8 (b) 4
 (c) 16 (d) 32
78. If a fair dice is rolled, the sample space is:
 (a) $\{0, 1, 2, 3, 4, 5, 6\}$
 (b) $\{1, 2, 3, 4, 5, 6\}$
 (c) $\{1, 2, 3, 4, 5, 6, 7\}$
 (d) None of these
79. A fair dice is rolled twice, the probability of getting sum 8 is:
 (a) $\frac{4}{36}$ (b) $\frac{6}{36}$

- (c) $\frac{5}{36}$ (d) $\frac{8}{36}$
80. If A and B are mutually exclusive events then $P(A \cup B) =$
 (a) $P(A) - P(B)$
 (b) $P(A)P(B)$
 (c) $P(A) + P(B)$
 (d) $P(A) + P(B) - P(A \cap B)$
81. If A and B are not mutually exclusive events the $P(A \cup B) =$
 (a) $P(A) + P(B)$
 (b) $P(A) - P(B)$
 (c) $P(A).P(B)$
 (d) $P(A)+P(B)-P(A \cap B)$
82. If A and B are independent events then $P(A \cap B) =$
 (a) $P(A).P(B)$
 (b) $P(A), P(A/B)$
 (c) $P(A) + P(B)$
 (d) $P(A) - P(B)$
83. If A and B are dependent events then $P(A \cap B) =$
 (a) $P(A).P(B)$
 (b) $P(A) + P(B)$
 (c) $P(A).P(B/A)$
 (d) None of these
84. The probability of drawing two kings from a pack of 52 cards:
 (a) $\frac{1}{13}$ (b) $\frac{1}{169}$
 (c) $\frac{12}{52}$ (d) $\frac{4}{52}$
85. The probability of drawing a picture card from a pack of 52 cards:
 (a) $\frac{12}{52}$ (b) $\frac{4}{52}$
 (c) $\frac{1}{52}$ (d) $\frac{13}{52}$
86. The probability of drawing a diamond card from a pack of 52 cards:
 (a) $\frac{1}{52}$ (b) $\frac{4}{52}$
 (c) $\frac{12}{52}$ (d) $\frac{13}{52}$

87. The probability of drawing a ball at random from the box is:
- 0.5
 - Cannot be completed from the given information
 - 0.7
 - 0.1
88. For two mutually exclusive events A and B, $P(A) = 0.3$ and $P(B) = 0.5$ then $P(A \cup B)$ is:
- 0.6
 - 0.15
 - 0.8
 - 0.5
89. If $P(B/A) = 0.30$ and $P(A \cap B) = 0.12$ then $P(A)$ is:
- 0.36
 - 0.45
 - 0.25
 - 0.40
90. The probability of an event 'A' is lies between:
- $0 \leq P(A) \leq 1$
 - $0 < P(A) < 1$
 - $-1 \leq P(A) \leq 1$
 - None of these
91. If A and B are dependent events, $P(A) = 0.40$ and $P(B/A) = 0.35$ then $P(A \cap B)$ is:
- 0.24
 - 0.14
 - 0.88
 - 0.30
92. If A and B are independent events, $P(A) = 0.45$, $P(B) = 0.60$ then $P(A \cap B)$ is:
- 0.75
 - 0.45
 - 0.27
 - 0.65
93. The probability of drawing one white ball from a bag containing 2 white, 3 blue and 3 black balls is:
- $\frac{1}{2}$
 - $\frac{3}{8}$
 - $\frac{5}{8}$
 - $\frac{1}{4}$
94. A letter is chosen at random from the word Mathematics the probability of getting a 'M' is:
- $\frac{2}{11}$
 - $\frac{3}{11}$
95. $P(A \cap B) = P(A) \cdot P(B/A)$, then A and B are:
- Mutually exclusive
 - Dependent
 - Independent
 - Equally likely
96. If $P(B/A) = P(B)$ then A and B are:
- Dependent
 - Independent
 - Mutually exclusive
 - None of these
97. If A and B are independent, $P(A) = 0.45$ and $P(B) = 0.20$ then $P(A \cup B)$:
- 0.65
 - 0.09
 - 0.56
 - 0.60
98. If a fair dice is rolled twice, the probability of getting doublet is.
- $\frac{1}{9}$
 - $\frac{1}{4}$
 - $\frac{5}{36}$
 - $\frac{1}{6}$
99. If a fair coin is tossed 4 times, the probability of getting atleast 2 heads:
- $\frac{5}{16}$
 - $\frac{15}{16}$
 - $\frac{11}{16}$
 - $\frac{6}{66}$
100. If $P(B) \neq 0$ then $P(A/B) =$
- $\frac{P(A \cap B)}{P(B)}$
 - $\frac{P(A \cap B)}{P(A)}$
 - $P(A \cap B)$
 - None of these
-

Answers

1.	(a)	2.	(c)	3.	(b)	4.	(d)	5.	(a)
6.	(b)	7.	(c)	8.	(b)	9.	(a)	10.	(b)
11.	(c)	12.	(d)	13.	(a)	14.	(b)	15.	(c)
16.	(d)	17.	(b)	18.	(d)	19.	(a)	20.	(c)
21.	(d)	22.	(b)	23.	(c)	24.	(a)	25.	(b)
26.	(c)	27.	(a)	28.	(d)	29.	(a)	30.	(c)
31.	(d)	32.	(c)	33.	(a)	34.	(b)	35.	(c)
36.	(b)	37.	(a)	38.	(d)	39.	(b)	40.	(c)
41.	(d)	42.	(b)	43.	(a)	44.	(c)	45.	(b)
46.	(c)	47.	(d)	48.	(b)	49.	(a)	50.	(d)
51.	(c)	52.	(b)	53.	(a)	54.	(c)	55.	(d)
56.	(c)	57.	(a)	58.	(b)	59.	(b)	60.	(c)
61.	(a)	62.	(b)	63.	(c)	64.	(d)	65.	(a)
66.	(d)	67.	(b)	68.	(c)	69.	(b)	70.	(a)
71.	(c)	72.	(d)	73.	(c)	74.	(b)	75.	(c)
76.	(d)	77.	(a)	78.	(b)	79.	(c)	80.	(c)
81.	(d)	82.	(a)	83.	(c)	84.	(b)	85.	(a)
86.	(d)	87.	(b)	88.	(c)	89.	(d)	90.	(a)
91.	(b)	92.	(c)	93.	(d)	94.	(a)	95.	(b)
96.	(b)	97.	(c)	98.	(d)	99.	(c)	100.	(a)

Model Paper – 4

1. A variable whose value is determined by the outcome of a random experiment is called:
 (a) Random
 (b) Random Variable
 (c) Constant (d) None of these
2. A random variable is also called:
 (a) Constant (b) Variable
 (c) Attribute
 (d) Chance Variable
3. A random variable assuming only a finite number of values is called:
 (a) Discrete Random Variable
 (b) Continuous Random Variable
 (c) Random Variable
 (d) None of these
4. A random variable assuming infinite number of values is called:
 (a) Absolute Variable
 (b) Discrete random variable
 (c) Continuous random variable
 (d) None of these
5. The number of students in a class is:
 (a) Continuous variable
 (b) Discrete variable
 (c) Definite variable
 (d) None of these
6. The speed of car is:
 (a) Discrete variable
 (b) Absolute variable
 (c) Continuous variable
 (d) None of these
7. A continuous probability represented by a:
 (a) Graph (b) Table
 (c) Constant (d) None of these
8. A discrete probability distribution may be represented by:
 (a) A graph
 (b) A mathematical equation
 (c) A table (d) All of these
9. Random numbers can be generated mechanically by:
 (a) Use of random numbers table
 (b) Use of digital computers
 (c) Ordinary calculators
 (d) None of these
10. When four coins are tossed, the value of a random variable s (No. of heads) is:
 (a) 1, 2, 3, 4 (b) 0, 1, 2, 3, 4
 (c) 0, 1, 2, 3 (d) None of these
11. The distribution function $F(x)$ is equal to:
 (a) $P(X \geq x)$ (b) $P(X = x)$
 (c) $P(X \leq x)$ (d) $P(X > x)$
12. If ' x ' is a continuous random variable, then function $f(x)$ is:
 (a) Probability density function
 (b) Distribution function
 (c) Probability function
 (d) None of these
13. If ' x ' is a discrete random variable, the function $f(x)$ is:
 (a) Distribution function
 (b) Probability function
 (c) Density function
 (d) None of these
14. The probability function must be:
 (a) Negative (b) Normal
 (c) Positive (d) None of these
15. If x and y are random variable then $E(x + y)$ is equal to:
 (a) $E(x) + E(y)$ (b) $E(x) - E(y)$
 (c) $E(x) + Y$ (d) None of these
16. The sum of probabilities of a discrete random variable is:
 (a) Zero (b) Four
 (c) Two (d) One
17. If x and y independent random variables then $E(xy)$ is equal to:
 (a) $E(x).E(y)$ (b) $xE(y)$
 (c) $E(x)+E(y)$ (d) None of these
18. If x and y are independent random variables then $\text{var}(x - y)$ is equal to:
 (a) $\text{Var}(x) - \text{Var}(y)$
 (b) $\text{Var}(x) : \text{Var}(y)$
 (c) $\text{Var}(x) + \text{Var}(y)$
 (d) None of these
19. If x is a random variables, 'a' and 'b' are constants then $E(ax + b)$ is equal to:
 (a) $E(ax) + E(b)$
 (b) $aE(x) + b$

- (c) $aE(x) + E(b)$
 (d) None of these
20. If ' x ' is a random variable, then $\text{var}(2 - 3x)$ is equal to:
 (a) $\text{Var}(2) - \text{Var}(3x)$
 (b) $\text{Var}(3x)$
 (c) $2 - \text{Var}(3x)$ (d) $9 \text{Var}(x)$
21. Each throwing, in an experiment of rolling a dice is called:
 (a) Probability distribution
 (b) Trial
 (c) Sample Space
 (d) None of these
22. A trial having only two possible outcomes success or failure is called:
 (a) Binomial trial
 (b) Hyper geometric trial
 (c) Bernoulli trial
 (d) None of these
23. The probability of success is denoted by:
 (a) p (b) q
 (c) n (d) None of these
24. In a binomial experiment, the repeated trials are:
 (a) Dependent. (b) Normal
 (c) Independent
 (d) None of these
25. In a binomial experiment with ' n ' independent trials, the distribution of x is called:
 (a) Normal distribution
 (b) Binomial distribution
 (c) Hyper-geometric mean
 (d) None of these
26. The parameters of binomial probability distribution are:
 (a) n and q (b) p and q
 (c) n and p (d) None of these
27. The binomial distribution is symmetrical if $p = q =$:
 (a) 2 (b) 1
 (c) $\frac{1}{4}$ (d) $\frac{1}{2}$
28. The binomial distribution is positively skewed if:
 (a) $p = q$ (b) $p < \frac{1}{2}$
- (c) $p > \frac{1}{2}$ (d) $p = \frac{1}{2}$
29. The binomial distribution is negatively skewed if:
 (a) $p > \frac{1}{2}$ (b) $p = \frac{1}{2}$
 (c) $p < \frac{1}{2}$ (d) None of these
30. The binomial experiment is called Bernoulli experiment if $n =$
 (a) 2 (b) 0
 (c) 1 (d) 3
31. The binomial random variable is:
 (a) Continuous (b) Discrete
 (c) Hyper-geometric
 (d) None of these
32. A binomial random variable can assume the values from:
 (a) 0 to 1 (b) 0 to $n+1$
 (c) 0 to n (d) None of these
33. The mean of the binomial distribution is:
 (a) np (b) pq
 (c) npq (d) None of these
34. The variance of the binomial distribution is:
 (a) np (b) nq
 (c) npq (d) npq
35. The standard deviation of the binomial distribution is:
 (a) nq (b) npq
 (c) npq (d) None of these
36. The shape of the binomial distribution depends on the values of:
 (a) n and q (b) p and q
 (c) n and p (d) None of these
37. The binomial frequency distribution of ' x ' successes in ' n ' independent trials is:
 (a) ${}^n C_x p^x q^{n-x}$
 (b) $N {}^n C_x \cdot p^x q^{n-x}$
 (c) $\frac{1}{N} {}^n C_x p^x q^{n-x}$
 (d) None of these
38. If $n = 12$ $p = 0.3$, the mean of binomial distribution is:
 (a) 2.6 (b) 4.6

- (c) 1.6 (d) 3.6
39. If $n = 12$ and $p = 0.3$, the variance of binomial distribution is:
 (a) 2.52 (b) 2.42
 (c) 3.52 (d) 4.52
40. If $n = 16$ and $p = 0.4$, the standard deviation of binomial distribution is:
 (a) 2.48 (b) 2.96
 (c) 1.96 (d) 1.5
41. The variance of a binomial distribution depends on:
 (a) Number of trials
 (b) Probability of success
 (c) Probability of failure
 (d) None of these
42. For a binomial distribution which of following is true:
 (a) Mean = Variance
 (b) Mean > Variance
 (c) Mean < Variance
 (d) None of these
43. The mean of a binomial distribution depends on:
 (a) Probability of success and number of trials
 (b) Probability of failure
 (c) Probability of success
 (d) None of these
44. The number of possible outcomes in a Bernoulli trial is:
 (a) Five (b) One
 (c) Three (d) Two
45. The mean Median and Mode of the binomial distribution is equal if:
 (a) $p < 0.5$ (b) $p = 0.5$
 (c) $p > 0.5$ (d) None of these
46. The Hyper-geometric random variable is a:
 (a) Discrete random variable
 (b) Continuous random variable
 (c) Independent random variable
 (d) None of these
47. The parameters of hyper-geometric distribution are:
 (a) n, x, k (b) np
 (c) N, n, k (d) None of these
48. The probability of success changes from trial to trial in:
 (a) Normal distribution
 (b) Binomial distribution
 (c) Continuous distribution
 (d) Hyper-geometric distribution
49. The probability of success does not change from trial to trial in:
 (a) Hyper-geometric distribution
 (b) Binomial distribution
 (c) Normal distribution
 (d) None of these
50. The successive trials are without replacement in:
 (a) Hyper-geometric distribution
 (b) Normal distribution
 (c) Binomial distribution
 (d) None of these

Answers

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

Model Paper – 5

1. The successive trials are with replacement in:
 - Hypergeometric distribution
 - Continuous distribution
 - Binomial distribution
 - None of these
2. A fair dice is rolled twice. The probability of getting sum is 9:

(a) $\frac{1}{6}$	(b) $\frac{5}{36}$
(c) $\frac{6}{36}$	(d) $\frac{1}{9}$
3. The probability of at most two heads occur when 3 coin are tossed:

(a) $\frac{1}{2}$	(b) $\frac{7}{8}$
(c) $\frac{5}{8}$	(d) $\frac{6}{16}$
4. In a binomial distribution mean is 40 and variance is 16 the value of p is:
 - 0.40
 - 0.5
 - 0.60
 - 0.3
5. In a binomial distribution mean = 32 and S.D. = 4 the value of 'n' is:
 - 64
 - 48
 - 96
 - None of these
6. The sign test is:
 - Less powerful than that of the Wilcoxon signed rank test
 - More powerful than the paired sample t-test
 - More powerful than the Wilcoxon signed rank test.
 - Equivalent to Mann-Whitney test
7. The nonparametric equivalent of an unpaired samples t-test is the:
 - Sign test
 - Wilcoxon signed rank test
 - Mann-Whitney U test
 - Kruskal-Wallis Test
8. The Mann-Whitney U test is preferred to a t-test when:
 - Data are paired
 - Sample sizes are small
 - The assumption of normality is not met
 - Samples are dependent
9. When using the sign test, if two scores are tied, then we:
 - Count them
 - Discard them
 - Depends upon the scores
 - None of these
10. The sign test assumes that the:
 - Samples are independent
 - Samples are dependent
 - Samples have the same mean
 - None of these
11. When testing for randomness, we can use:
 - Mann-Whitney U test
 - Sign test
 - Runs test
 - None of these
12. The Runs test results in rejecting the null hypothesis of randomness when:
 - There is an unusually large number of runs
 - There is an unusually small number of runs
 - Either of the above
 - None of the above
13. The Wilcoxon rank-sum test can be:
 - Upper tailed
 - Lower tailed
 - Either of the above
 - None of the above
14. The Wilcoxon rank-sum test compares:
 - Two populations
 - Three populations
 - A sample mean to the population mean.
 - Any number of populations
15. The Wilcoxon signed rank is used:
 - Only with independent samples
 - Only in matched pairs samples

- (c) As an alternative to the Kruskal-Wallis test
 (d) To test for randomness
16. Which of the following test use rank sums?
 (a) F test
 (b) Chi-square and Sign tests
 (c) Runs test
 (d) Kruskal-Wallis and Wilcoxon tests
17. Which of the following tests must be two-sided?
 (a) Kruskal-Wallis
 (b) Wilcoxon Signed rank
 (c) Runs test (d) Sign test
18. In testing for the difference between two populations, it is possible to use:
 (a) The Wilcoxon rank-sum test
 (b) The sign test
 (c) Either of the above
 (d) None of the above
19. In a Wilcoxon rank-sum test:
 (a) Ties never affect the decision
 (b) Ties always affect the decision
 (c) Ties within one sample may affect the decision
 (d) Ties between the two samples may affect the decision
20. The Spearman rank-correlation test requires that the:
 (a) Data must be measured on the same scale
 (b) Data at least ordinal scaled
 (c) Data must be from two independent samples
 (d) Data must be distributed at least approximately as a t-distribution
21. To perform a runs test for randomness the data must be:
 (a) Qualitative
 (b) Quantitative
 (c) Divided into at least two classifications
 (d) Divided into exactly two classifications
22. To compare the annual income of engineers with those of clerks, two random samples are obtained $n_1 = 20$ and $n_2 = 20$. A decision was made to use the Wilcoxon rank-sum test to determine if clerks earn more than engineers. Which of the following can be a valid reason for this decision.
 (a) The sample are too small to estimate μ and σ^2
 (b) The samples do not adequately represent the populations
 (c) The samples are from non-normal distributions
 (d) The samples are not of equal size
23. 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 brands taste equally good is:
 (a) One way analysis of variance
 (b) Wilcoxon rank-sum test
 (c) Spearman rank difference
 (d) Kruskal-Wallis test
24. If a Chi-square goodness of fit test has 6 categories and an $N = 30$, then the correct number of degrees of freedom is:
 (a) 5 (b) 6
 (c) 28 (d) 29
25. 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 well call for:
 (a) A Kolmogorov-Smirnov test
 (b) A Kruskal-Wallis test
 (c) A Wilcoxon rank-sum test
 (d) A Spearman rank correlation test
26. 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 $P = 0.3$:
- The Kolmogorov-Smirnov test
 - The Kruskal-Wallis test
 - The Mann-Whitney test
 - The Wilcoxon signed-rank test
27. In the Kruskal-Wallis test of k samples, the appropriate number of degrees of freedom is:
- k
 - $k - 1$
 - n_k
 - $n - k$
28. When compare to parametric methods, nonparametric methods are:
- Less accurate
 - Less efficient
 - Computationally easier
 - (b) and (c) but not (a)
29. In the plural sense, statistics mean:
- Methods
 - Numerical Data
 - Sample values
 - Population values
30. In the singular sense, statistics means:
- Methodology
 - Numerical data
 - Sample values
 - Count data
31. Data used by an agency which originally collected them are:
- Primary data
 - Raw data
 - Secondary data
 - Grouped data
32. The word statistics is at present used in:
- Two senses
 - Three senses
 - Four senses
 - None of these
33. Data in the Population Census Reports are:
- Ungrouped data
 - Secondary data
 - Primary data
34. Measurements usually provide:
- Discrete data
 - Continuous data
 - Qualitative data
 - Primary data
35. Counting or enumerations usually provide:
- Continuous data
 - Qualitative data
 - Discrete data
 - Grouped data
36. Hourly temperature recorded by Weather Bureau represents:
- Discrete data
 - Continuous data
 - Qualitative data
 - Secondary data
37. Number of accidents recorded yesterday in Lahore is a:
- Discrete variable
 - Continuous variable
 - Qualitative variable
 - Constant
38. The amount of milk given by a cow is a:
- Qualitative variable
 - Discrete variable
 - Continuous variable
 - Constant
39. Colour of hair is a:
- Continuous variable
 - Discrete variable
 - Qualitative variable
 - Quantitative variable
40. Smoking habits of residents of a city are:
- Qualitative data
 - Quantitative data
 - Discrete data
 - Continuous data
41. Major area of statistics today is concerned with drawing conclusions from:
- Samples
 - Populations
 - Complete study

42. (d) Complete universe
 The phase of statistics that is concerned with the description and analysis of sample or population data is called:
 (a) Inferential statistics
 (b) Descriptive statistics
 (c) Inductive statistics
 (d) Sample statistics
43. The phase of statistics that is concerned with the procedures and methodology for obtaining valid conclusions is called
 (a) Descriptive statistics
 (b) Deductive statistics
 (c) Inferential statistics
 (d) Sample statistics
44. Continuous data are differentiated from discrete data in that:
 (a) Discrete data classes are represented by fractions
 (b) Continuous data classes may be represented by fractions
 (c) Continuous data take on only whole numbers
 (d) Discrete data can take on any real number
45. Information recorded in its original form, whether counts or
46. measurements, is referred to as:
 (a) Continuous data
 (b) Raw data
 (c) Discrete data
 (d) Arrayed data
47. Life of a T.V. tube is a:
 (a) Discrete variable
 (b) Continuous variable
 (c) Qualitative variable
 (d) Constant
48. A constant can assume:
 (a) Only one value
 (b) More than one value
 (c) Different values
 (d) No value at all
49. A statistic which is not measurable is called:
 (a) A constant (b) An attribute
 (c) A variable (d) A parameter
50. The number 4.50001 rounded off to nearest unit (whole number) is:
 (a) 4 (b) 5
 (c) 4.5 (d) 4.01
50. The number 5.56500 rounded off to nearest hundredth (two decimal places) is:
 (a) 5.57 (b) 5.56
 (c) 6.00 (d) 5.00

Answers

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