

**Department: B.Sc. Information Technology**

**Class: SY IT**

**Semester – IV (ATKT)**

**Subject: Computer oriented statistical techniques**

**Sample Questions**

**Multiple Choice Questions**

1) expectation of a random variable X(continuous or discrete) is given by \_\_\_\_\_

a.  $\sum xf(x), \int xf(x)$

b.  $\sum x^2 f(x), \int x^2 f(x)$

c.  $\sum f(x), \int f(x)$

d)  $\sum xf(x^2), \int xf(x^2)$

2)Mean of a random variable X is given by \_\_\_\_\_

a.  $E(X)$

b. $E(X^2)$

c.  $E(X^2) - (E(X))^2$

d.  $(E(X))^2$

3) of a random variable X is given by \_\_\_\_\_

a.  $E(X)$

b. $E(X^2)$

c.  $E(X^2) - (E(X))^2$

d. $(E(X))^2$

4)Mean of a constant 'a' is \_\_\_\_\_

a. 0

b. a

c. a/2

d. 1

5) Variance of a constant 'a' is \_\_\_\_\_

- a. 0
- b. a
- c.  $a/2$
- d. 1

6) Find the expectation of a random variable X if  $f(x) = ke^{-x}$  for  $x > 0$  and 0 otherwise.

- a. 0
- b. 1
- c. 2
- d. 3

7) Find the mean of a random variable X if  $f(x) = x - 5/2$  for  $0 < x < 1$  and  $2x$  for  $1 < x < 2$  and 0 otherwise.

- a. 3.5
- b. 3.75
- c. 2.5
- d. 2.75

8) Find the mean of a continuous random variable X if  $f(x) = 2e^{-x}$  for  $x > 0$  and  $-ex$  for  $x < 0$ .

- a. 0
- b. 1
- c. 2
- d. 3

9)  $E(X) = npq$  is for which distribution?

- a. Bernoulli's
- b. Binomial
- c. Poisson's
- d. Normal

10)  $E(X) = \lambda$  is for which distribution?

a. Bernoulli's

b. Binomial

c. Poisson's

d. Normal

11)  $E(X) = \mu$  and  $V(X) = \sigma^2$  is for which distribution?

a. Bernoulli's

b. Binomial

c. Poisson's

d. Normal

12) The standard deviation is always \_\_\_\_\_ than the mean deviation

a. Greater

b. Less

c. Equal

d. positive

13) The mean deviation of the values, 18, 12, 15 is

a. 6

b. Zero

c. 3

d. 2

14) If the standard deviation of the values 2, 4, 6, 8 is 2.58, then the standard deviation of the values 4, 6, 8, 10 is

a. 2.58

b. 5

c. 4.66

d. 2.33

15) Which of these is a relative measure of dispersion

a. Standard Deviation

- b. Variance
- c. Coefficient of Variation
- d. mean

16) The variance of a constant is

- a. Zero
- b. Constant
- c. Negative
- d. positive

17) The variance of 5 numbers is 10. If each number is divided by 2, then the variance of new numbers is

- a. 20
- b. 5
- c. 2.5
- d. 5.5

18) Variance is always calculated from

- a. Mode
- b. Variance
- c. Geometric Mean
- d. Median

19) The sum of squared deviations of a set of  $n$  values from their mean is

- a. Zero
- b. Maximum
- c. Least
- d. minimum

20) The measure of Dispersion can never be

- a. Positive
- b. Negative

c. 0

d. 1

21) Suppose for 40 observations, the variance is 50. If all the observations are increased by 20, the variance of these increased observations will be

a. 50

b. 70

c.  $50/20$

d.  $50-20 = 30$

22) Standard deviation is calculated from the Harmonic Mean (HM)

a. Always

b. Sometimes

c. Never

d. greater

23) The measure of dispersion is changed by a change of

a. Origin

b. Scale

c. Algebraic Signs

d. parameter

24) If all values are same then the measure of dispersion will be

a. 1

b. 0

c. Mean

d. Mode

25) Mean Deviation, Variance and Standard Deviation of the values 4, 4, 4, 4, 4, 4 is

a. 4

b. 8

c. 2

d. 12

26) What is the assumption made for performing the hypothesis test with T distribution?

- a. the distribution is non-symmetric
- b. the distribution has more than one modal class
- c. the distribution has a constant variance
- d. the distribution follows a normal distribution

27) A hypothesis is rejected at 0.6 Level of Significance then \_\_\_\_\_

- a. it will be rejected at any level
- b. it must be rejected at 0.5 level
- c. it may be rejected at 0.5 level
- d. it cannot be rejected at 0.5 level

28) In a two tailed test when a Null Hypothesis is rejected for a True Alternative Hypothesis then it has \_\_\_\_\_

- a. Type 1 error
- b. Type 2 error
- c. No error
- d. Many errors

29) In a hypothesis test, what does the p value signify?

- a. smallest level of significance for rejection of Null Hypothesis
- b. largest level of significance for rejection of Null Hypothesis
- c. smallest level of significance for acceptance of Null Hypothesis
- d. smallest level of significance for acceptance of Null Hypothesis

30) A Null Hypothesis has Level of Significance 9%. For what values of Level of Significances it will be rejected?

- a. 0.99
- b. 0.009
- c. 0.099

d. 0.9

31) Consider a trial of a criminal. If a type 1 error has occurred in the judgement then which of the following statement is true?

- a. a guilty person is set free
- b. an innocent person is convicted
- c. a guilty person is convicted
- d. an innocent person is set free

32) If a Null Hypothesis is accepted then the value of Test statistic lies in the \_\_\_\_\_

- a. Acceptance region
- b. Rejection region
- c. Critical region
- d. Sample region

33) The Test Statistic for a Hypothesis testing is given by the formula \_\_\_\_\_

- a. Sample-Population/Standard Error
- b. Sample statistic-Parameter/Standard Error
- c. Sample mean-Population mean/Population standard deviation
- d. Statistic-E(statistic)/Variance

34) The range of Level of Significance lies between \_\_\_\_\_

- a.  $-\infty$  and 0
- b.  $-\infty$  and 1
- c. 0 and  $\infty$
- d. 0 and 1

35) The effect of rejection of a hypothesis with decrease in sample size \_\_\_\_\_

- a. decreases
- b. increases
- c. remains constant
- d. fluctuates

36) The composite hypothesis holds true when?

- a.  $\phi > \phi_0$
- b.  $\phi < \phi_0$
- c.  $\phi = \phi_0$
- d.  $\phi \gg \phi_0$

37) A paired T test consists of n pairs of observations. What is the number of degrees of freedom of the test?

- a.  $2n-1$
- b.  $2n$
- c.  $n-1$
- d.  $n$

38) The independent values in a set of values of a test is called as?

- a. Degrees of freedom
- b. Test Statistic
- c. Level of Significance
- d. Level of Confidence

39) A T-test sample has 7 pairs of samples. The distribution should contain \_\_\_\_\_

- a. 16 degrees of freedom
- b. 15 degrees of freedom
- c. 5 degrees of freedom
- d. 6 degrees of freedom

40) What is the mean of a Chi Square distribution with 6 degrees of freedom?

- a. 4
- b. 12
- c. 6
- d. 8

41) Which Chi Square distribution looks the most like a normal distribution?

- a. A Chi Square distribution with 4 degrees of freedom
- b. A Chi Square distribution with 5 degrees of freedom
- c. A Chi Square distribution with 6 degrees of freedom
- d. A Chi Square distribution with 16 degrees of freedom

42) Which of these distributions is used for a testing hypothesis?

- a. Normal Distribution
- b. Chi-Squared Distribution
- c. Gamma Distribution
- d. Poisson Distribution

43) If the assumed hypothesis is tested for rejection considering it to be true is called?

- a. Null Hypothesis
- b. Statistical Hypothesis
- c. Simple Hypothesis
- d. Composite Hypothesis

44) A statement whose validity is tested on the basis of a sample is called?

- a. Null Hypothesis
- b. Statistical Hypothesis
- c. Simple Hypothesis
- d. Composite Hypothesis

45) A hypothesis which defines the population distribution is called?

- a. Null Hypothesis
- b. Statistical Hypothesis
- c. Simple Hypothesis
- d. Composite Hypothesis

46) If the null hypothesis is false then which of the following is accepted?

- a. Null Hypothesis

- b. Positive Hypothesis
- c. Negative Hypothesis
- d. Alternative Hypothesis.

47) The rejection probability of Null Hypothesis when it is true is called as?

- a. Level of Confidence
- b. Level of Significance
- c. Level of Margin
- d. Level of Rejection

48) The point where the Null Hypothesis gets rejected is called as?

- a. Significant Value
- b. Rejection Value
- c. Acceptance Value
- d. Critical Value

49) If the Critical region is evenly distributed then the test is referred as?

- a. Two tailed
- b. One tailed
- c. Three tailed
- d. Zero tailed

50) The type of test is defined by which of the following?

- a. Null Hypothesis
- b. Simple Hypothesis
- c. Alternative Hypothesis
- d. Composite Hypothesis

51) Which of the following is defined as the rule or formula to test a Null Hypothesis?

- a. Test statistic
- b. Population statistic

c. Variance statistic

d. Null statistic

52) Consider a hypothesis  $H_0$  where  $\phi_0 = 5$  against  $H_1$  where  $\phi_1 > 5$ . The test is?

a. Right tailed

b. Left tailed

c. Center tailed

d. Cross tailed

53) Consider a hypothesis where  $H_0$  where  $\phi_0 = 23$  against  $H_1$  where  $\phi_1 < 23$ . The test is?

a. Right tailed

b. Left tailed

c. Center tailed

d. Cross tailed

54) Type 1 error occurs when?

a. We reject  $H_0$  if it is True

b. We reject  $H_0$  if it is False

c. We accept  $H_0$  if it is True

d. We accept  $H_0$  if it is False

55) The probability of Type 1 error is referred as?

a.  $1-\alpha$

b.  $\beta$

c.  $\alpha$

d.  $1-\beta$

56) Alternative Hypothesis is also called as?

a. Composite hypothesis

b. Hypothesis

c. Simple Hypothesis

d. Null Hypothesis

57) A population contains  $N$  items out of which  $n$  items are selected with replacement. Find the probability of the sample being selected.

- a.  $1/N$
- b.  $1/nN$
- c.  $1/NCn$
- d.  $1/Nn$

58) A box contains 26 pairs of napkins. If 3 pairs of napkins are selected at random with a replacement then the number of possible samples is \_\_\_\_\_

- a. 17675
- b. 17566
- c. 17576
- d. 17556

59) A sample was formed consisting of 8 students from a total of 56 students for certain task. Find the sampling fraction of the population of students.

- a.  $1/7$
- b. 7
- c. 49
- d.  $1/49$

60) Find the population proportion  $p$  for an IPL team having total 30 players with 10 overseas players.

- a.  $1/2$
- b.  $1/3$
- c.  $2/3$
- d.  $1/4$

61) It is provided that for a sampling distribution  $E(X)=11$  and  $\phi=13$ . Find the bias in the sampling.

- a. 2
- b. 4
- c. 6

d.3

62) Find the standard error of population proportion  $p$  for sampling with replacement. The population proportion is 0.5 and size of sample is 4.

- a. 0.5
- b. 0.25
- c. 0.225
- d. 0.375

63) If the mean of population is 29 then the mean of sampling distribution is \_\_\_\_\_

- a. 29
- b. 30
- c. 21
- d. 31

64) In systematic sampling, population is 240 and selected sample size is 60 then sampling interval is \_\_\_\_\_

- a. 240
- b. 60
- c. 4
- d. 0.25

65) The method of selecting a desirable portion from a population which describes the characteristics of whole population is called as \_\_\_\_\_

- a. sampling
- b. segregating
- c. dividing
- d. implanting

66) Let  $A$  and  $B$  be two events such that the occurrence of  $A$  implies occurrence of  $B$ , But not vice-versa, then the correct relation between  $P(A)$  and  $P(B)$  is?

- a.  $P(A) < P(B)$
- b.  $P(B) \geq P(A)$

c.  $P(A) = P(B)$

d.  $P(A) \geq P(B)$

67) If  $A \subset B$  and  $B \subset A$  then,

a.  $P(A) > P(B)$

b.  $P(A) < P(B)$

c.  $P(A) = P(B)$

d.  $P(A) < P(B)$

68) If A is a perfect subset of B and  $P(a) < P(b)$ , then  $P(B - A)$  is equal to \_\_\_\_\_

a.  $P(a) / P(b)$

b.  $P(a)P(b)$

c.  $P(a) + P(b)$

d.  $P(b) - P(a)$

69) What is the probability of an impossible event?

a. 0

b. 1

c. Not defined

d. Insufficient data

70) The difference between the sample value expected and the estimates value of the parameter is called as?

a. bias

b. error

c. contradiction

d. difference

71) In which of the following types of sampling the information is carried out under the opinion of an expert?

a. quota sampling

b. convenience sampling

- c. purposive sampling
- d. judgement sampling

72) The sampling error is defined as?

- a. difference between population and parameter
- b. difference between sample and parameter
- c. difference between population and sample
- d. difference between parameter and sample

73) Any population which we want to study is referred as?

- a. standard population
- b. final population
- c. infinite population
- d. target population

74) Suppose we want to make a voters list for the general elections 2019 then we require \_\_\_\_\_

- a. sampling error
- b. random error
- c. census
- d. simple error

75) If for a distribution the difference of first quartile and median is greater than difference of median and third quartile then the distribution is classified as

- a. absolute open ended
- b. positively skewed
- c. negatively skewed
- d. not skewed at all

76) If the first quartile and third quartile are as 32 and 35 respectively with the median of 20 then distribution is skewed to

- a. lower tail
- b. upper tail

c.close end tail

d.open end tail

77)If the beta one is 9, beta two is 11 then coefficient of skewness is

a.0.589

b.0.689

c.0.489

d.0.889

78)The measurement techniques used to measure the extent of skewness in data set values are called

a.measure of distribution width

b.measure of median tail

c.measure of tail distribution

d.measure of skewness

79)The statistical measures such as average deviation, standard deviation and mean are classified as part of

a.deciles system

b.moment system

c.percentile system

d.quartile systems

80)In statistical procedures, the skewness is used to measure the

a.amount of variance

b.amount of upper tail values

c.amount of dispersion

d.direction of dispersion

81) In kurtosis, the frequency curve which looks more peaked than normal curve of bell shaped distribution is classified as

a.mega curve

b.mesokurtic

c.leptokurtic

d.platykurtic

82) If the values of skewness and arithmetic mean is given as 4 and 17 respectively then mode of the values is

a.68

b.4.25

c.21

d.13

83)If the median is 12, mean is 15 and the standard deviation of data is 3 then Karl Pearson's coefficient of skewness is

a.17

b.27

c.15

d.3

84)The moment about mean which is indication of flatness of frequency curve is classified as

a.third moment

b.second moment

c.first moment

d.fourth moment

85)The moment about mean which is considered as measure of dispersion and is equivalent to variance is called

a.eighth moment

b.fifth moment

c.first moment

d.second moment

86)Which one of the following does measure risk?

a. Coefficient of variation

- b. Standard deviation
- c. Expected value
- d. All are measures of risk.

87) If a person's utility doubles when their income doubles, then that person is risk

- a. averse.
- b. neutral.
- c. seeking.
- d. There is not enough information given in the question to determine an answer.

88) Which of the following is a subset of population?

- a. distribution
- b. sample
- c. data
- d. set

89) The sampling error is defined as?

- a. difference between population and parameter
- b. difference between sample and parameter
- c. difference between population and sample
- d. difference between parameter and sample

90) Any population which we want to study is referred as?

- a. standard population
- b. final population
- c. infinite population
- d. target population

91) If the quartile range is 24 then the quartile deviation is

- a. 48
- b. 12

c.24

d.72

92) If mean absolute deviation of set of observations is 8.5 then value of quartile deviation is

a.7.08

b.9.08

c.10.2

d.11.2

93) The sum of all the squared deviations is divided by the total number of observations to calculate

a.population deviation

b.population variance

c.sample deviation

d.sample variance

94) For the recorded observation, the ratios measured by absolute variation are considered as

a.non-relative measures

b.relative measures

c.high uniform measures

d.low uniform measures

95) If the arithmetic mean is multiplied to coefficient of variation then the resulting value is classified as

a.coefficient of deviation

b.coefficient of mean

c.standard deviation

d.variance

96) The mean of the squared deviations of some observations from their arithmetic mean is called

a.standard deviation

b.variation

c.median

d.mode

97)The positive square root of the mean of the squared deviations of some observations from their arithmetic mean is called

a.standard deviation

b.variation

c.median

d.mode

98)Sum of the deviations of a variable from its mean is always

a.0

b.1

c.2

d.5

99) The measures that are used to determine the degree or extent of variation in a data set are called

a.mean

b.median

c.measures of dispersion

d.measures of central tendency

100)True statements about non-parametric tests include:

a. they can be used on small samples

b. they can be used to analyse samples that are normally distributed

c. Student's paired t-test is a non-parametric test

d. they can be applied to ordinal data