SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
19MAT204 – PROBABILITY AND STATISTICS

Two mark Questions and Answers

1. Define standard error.

The S.D of sampling distribution of a statistic is known as its standard error.

2.What is Type I and Type II error?

i) Type I error : Reject H_0 when it is true.

ii) Type I error : Accept H_0 when it is wrong.

3.Write the application of 'F'-test .

1. To test if the 2 samples have come from the same population

2.To test whether there is any significant difference between two estimates of population variance.

4.Write two applications of ψ^2 test.

1. ψ^2 is used to test whether differences between observed and expected frequencies are significances.

2. To test the goodness of fit.

3. to test the independent of attributes.

5.Define critical region.

A region corresponding to a statistic t in the sample space S which lead to the rejection of H_0 is called critical region or rejection region. Those region which lead to the acceptance of H_0 give us a region called Acceptance region.

Define Level of significance.

The probability 'α' that a random value of the statistics 't' belongs to the critical region is known evel of significance. In otherwords, level of significance is the size of the Type I error.

6.Define Null hypothesis

The test of significance, we first set up of a hypothesis a definite statement about the population parameter, such a hypothesis is usually a hypothesis of no difference and it is denoted by $H_0.$

7.What do you mean by One tailed and two tailed tests?

When the hypothesis about the population parameter is rejected only for the value of sample statistic falling into one of the tails of the sampling distribution is known as one tailed test.

Two tailed test is one where the hypothesis about the population parameter is rejected for the

values of the sample statistic falling into the either tails of the sampling distribution.

8.What do you mean by Degrees of freedom?

The number of degrees of freedom is the total number of observations minus the number of independent constraints imposed on the observations.

What are parameters and statistics in sampling?

The statistical constants of the populations are called parameters. The statistical constant of the samples are called statistic. For example

Constants	Population	Sample
Mean	M	$\bar{x}$
SD	Σ	s

9.Mention the various steps involved in testing of hypothesis.

1. Null Hypothesis is defined. 2. Alternative Hypothesis defined. 3. LOS fixed. 4. Apply the test statistic. 5. write the conclusion whether H_0 is accepted or not.

10.Define Chi-Square test for goodness of fit

Chi Square test of goodness of fit is a test to find if the deviation of the experiment from theory is just by chance or it is due to the inadequacy of the theory to fit the observed data. By his test, we test whether differences between observed and expected frequencies are significant or not.

Write the formula for the Chi-square test of goodness of fit of a random sample to a hypothetical distribution.

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$, where O is the observed value and E is the expected value.

11.What are the applications of t test?

(i) Test of Hypothesis about the population mean.

(ii) Test of Hypothesis about the difference between two means.

(iii) Test of Hypothesis about the difference between two means with dependent samples.

(iv) Test of Hypothesis about the observed sample correlation coefficient and sample regression coefficient.

12.Write down any two properties of chi – Square distribution.

(i) The mean and variance of the chi – Square distribution are n and 2n respectively.

(ii) As n →∞ , Chi – Square distribution approaches a normal distribution.

(iii) The sum of independent Chi – Square variates is also a Chi – Square variate.

What are the assumptions for Student's 't' test?

(i) The parent population from which the sample drawn is normal.

(ii) The sample observations are independent.

(iii) The population standard deviation σ is unknown.