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Dr. Rajesh Verma,
Assistant professor and Head Uts
Department Of Zoology DK. College
Dumraon (Buxar).
Notes for B.Sc part 1st paper (2(A).

Que. (1.) Writes Notes on Test of independence?

Tests of independence involve using a Contingency table of observed (data) values.
The test Statistic for a test of independence is similar to that of a goodness-of-fit test:

$$\sum_{(i.j)} \frac{(O-E)^2}{E}$$

Where:

* O = Observed Values
* E = Expected Values
* i = The Number of rows in the table
* j = The Number of Columns in the table.

There are i.j terms of the form

$$\frac{(O-E)^2}{E}$$

A test of independence determines whether two factors are independent of or Not.

Note :- The expected Value for each Cell Needs to be at least five in order for you to use this test.

Example :-

Suppose A = a Speeding Violation in the last year and B = a cell phone user while driving. If A and B are independent $p(A \text{ AND } B) = p(A)\,p(B)$. A AND B is the event that a driver received a Speeding Violation last year and also used a Cell phone while driving. Suppose, in a Study of drivers who received Speeding Violation in the last year, and who used Cell phone while driving, that 755 people were Surveyed.

Let y = expected Number of drivers who used a cell phone while driving and received Speeding Violations.

if A and B are independent, then $P(A \text{ AND } B) = P(A)\,P(B)$. By Substitution,

$$\frac{y}{755} = \left(\frac{70}{755}\right)\left(\frac{305}{755}\right)$$

Solve for

$$y : y = \frac{(70)(305)}{755} = 28.3$$

About 28 people from the Sample are expected to use Cell phone while driving and and to receive Speeding Violations.

In a test of independence we State the Null and alternative hypotheses table Consists of two factors; the null hypothesis States that the factors are independent and the alternative hypothesis States that they are not independent (dependent).

The Test of independence is always right - tailed - Because of the Calculation of the expected and observed values ..... are not Close together, then

the test Statistic is very large and Chi-Square Curve, as it is in a goodness-of-fit.

The Number of degrees of freedom for the test of Independence is:

$$df = (\text{Number of Columns} - 1)(\text{Number of rows} - 1)$$

The following formula Calculates the expected Number (E):

$$E = \frac{(\text{row total})(\text{Column total})}{\text{total Number Surveyed}}$$

A Simple of 300 Student is taken. of the Students Surveyed 50 were music Students, while 250 where Not. Ninety-seven were on the honor roll, while 203 were not.