

## Important Question of Chai-Square test of Independence

1. The following table gives the number of good and bad parts produced by each of the shifts in a factory:

	Good parts	Bad parts	Total
Day shift	960	40	1000
Evening shift	940	50	990
Night shift	950	45	995
Total	2850	135	2985

Test whether or not the production of bad parts is independent of the shift n which they were produced.

2. A survey amongst women was conducted to study the family life. The observations are as follows.

	Happy	Not happy	Total
Educated	70	30	100
Not educated	60	40	100
Total	130	70	200

Test whether there is any association between family life and education.

3. The following table gives the number of persons whose eye sight is attacked and an injection of macugen is injected by doctor

	Eye sight Improved	Eye sight not Improved	Total
Injected	216	145	361
Not Injected	105	234	339
Total	321	379	700

Do you think macugen injection can improve the eye sight.

4. Can vaccination be regarded as preventive measure of small pox as evidenced by the following data of 1482 persons exposed to smallpox in a locality? 368 in all were attacked of these 1482 persons and 343 were vaccinated and of these only 35 were attacked.
5. Examine by any suitable method, whether the nature of area is related to voting to voting preference in the election for which the data are tabulated below:

Votes for Area	A	B	Total
Rural	620	480	1100
Urban	380	520	900
Total	1000	1000	2000

6. The groups of 100 people each were taken for testing the use of a vaccine. 15 persons contracted the disease out of the inoculated persons, while 25 contracted the disease in the other group. Test the efficiency of the vaccine using Chi-square test. (The value of  $\chi^2$  for one degree of freedom at 5% level of significance is 3.84).
7. The I.Q. and economic condition of home of 1000 students of an engineering college, Delhi were noted as given in the table:

Economic con. \ I.Q.	High	Low	total
Rich	100	300	400
Poor	350	250	600

Total	450	550	1000
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Find out whether there is any association between economic condition at home and I.Q. of the students. Given for 1 d. f.,  $\chi^2$  at the level of significance 0.05 is 3.84.

8. The following table shows among the 100 school boys between their English ability and their mathematical ability. Test whether the ability of two subjects. English and maths are associated or not.

English ability Maths ability	Good	Fair	Poor
Good	44	22	4
Fair	265	257	178
Poor	41	91	98

9. A study is conducted to determine if there is a relationship between the type of diet and exercise frequency. Data collected from 600 participants shows: Among those following a vegetarian diet (300 people), 150 exercise regularly, 100 occasionally, and 50 rarely. Among those following a non-vegetarian diet (200 people), 100 exercise regularly, 70 occasionally, and 30 rarely. Among those following a mixed diet (100 people), 30 exercise regularly, 50 occasionally, and 20 rarely. Test at a 0.01 significance level if diet type and exercise frequency are independent.
10. A psychologist studies the relationship between stress levels (low, moderate, high) and job types (desk job, field job, and remote job). The total number of participants surveyed is 450. The psychologist observes the following proportions:  
 40% have desk jobs, 30% have field jobs, and 30% have remote jobs.  
 Among desk job workers, 30% report low stress, 50% moderate stress, and 20% high stress.  
 Among field job workers, 20% report low stress, 40% moderate stress, and 40% high stress.  
 Among remote workers, 50% report low stress, 30% moderate stress, and 20% high stress.  
 Construct the contingency table and test if stress levels and job types are independent at a 0.05 significance level.