CHI-SQUARE PRACTICE PROBLEMS

1. A poker-dealing machine is supposed to deal cards at random, as if from an infinite deck.

In a test, you counted 1600 cards, and observed the following:

Spades	404
Hearts	420
Diamonds	400
Clubs	376

Could it be that the suits are equally likely? Or are these discrepancies too much to be random?

(Chi-square- 2.480)

2. In the garden pea, yellow cotyledon color is dominant to green, and inflated pod shape is dominant to the constricted form. Considering both of these traits jointly in self-fertilized dihybrids, the progeny appeared in the following numbers:

193 green, inflated

184 yellow constricted

556 yellow, inflated

61 green, constricted

Do these genes assort independently? Support your answer using Chi-square analysis.

(Chi-square- 0.312)

.3. A genetics engineer was attempting to cross a tiger and a cheetah. She predicted a phenotypic outcome of the traits she was observing to be in the following ratio 4 stripes only: 3 spots only: 9 both stripes and spots. When the cross was performed and she counted the individuals she found 50 with stripes only, 41 with spots only and 85 with both. According to the Chi-square test, did she get the predicted outcome?

(Chi-square- 4.74)

4. Suppose we want to know if gender has anything to do with political party preference. So, we poll 440 voters in a simple random sample to find out which political party they prefer. The results of the survey are provided in the table below.

-	NDA	I.N.D.I.A.	Independent	Total
Male	100	70	30	200
Female	140	60	20	220
Total	240	130	50	440

To see if gender is linked to political party preference, perform a Chi Square test to verify the assumed theory. (Chi-square- 9.837)

5. Suppose a researcher wants to know whether or not marital status is associated with education level. He decides to take a simple random sample of 300 individuals and obtains the following results:

	High School	Bachelor's	Master's or Higher	Total
Married	20	100	35	155
Single	50	80	15	145
Total	70	180	50	300

Use a Chi-Square Test of Independence to determine if there is a statistically significant association between the two variables.

(Chi-square- 22.7713)

6. A shop owner claims that an equal number of customers come into his shop each weekday. To test this hypothesis, an independent researcher records the number of customers that come into the shop on a given week and finds the following:

Monday: 50 customers, **Tuesday:** 60 customers, **Wednesday:** 40 customers, **Thursday:** 47 customers, **Friday:** 53 customers

Perform a Chi-Square goodness of fit test to determine if the data is consistent with the shop owner's claim.

(Chi-square- 4.36)