INSTRUCTIONS: ATTEPT ALL QUESTIONS

TIME: 3 HOURS

Question 1. (20 Marks)

Please state, in your own words, what the following terms mean

1. Contingency Table
2. Chi-Square Test
3. Least-Square Regression
4. Confidence Interval
5. Scatter Plot
6. Least Square Regression line
7. Degree of freedom df for a t-distribution
8. When to use a t distribution and when to use a normal distribution
9. Standard error
10. standard deviation

Question 2. (20 Marks)

Compute the following probabilities:

1. In tossing one coin twice, find P(HH) or P(exactly one head) or P(no head) or P(at least one head).
2. In throwing two dice, find P(sum is 4) or P(sum = 1) or P(sum is 4 or more)
3. In drawing one card randomly from a standard 52-card deck, find P(card is Ace)

Question 3. (20 Marks)

Each score listed below comes from a sample with the indicated mean and standard deviation. Find the indicated probability (in percent).

a. X is normal with mean 3, standard deviation 1.5, find $P(x \leq 6)$

b. X is normal with mean 3, standard deviation 3, find $P(x \geq 9)$

c. X is normal with mean 0, standard deviation 2, find $P(1< x < 2)$

d. X is normal with mean 3, standard deviation 1, find $P(x \geq 2)$

Question 4. (20 Marks)

a) Suppose you were asked to compute a *95%* confidence interval. The resulting interval, however, turned out to be too large to be of use to your client. What could you do to achieve a smaller confidence interval?

b) The lifetimes (in years) of ten automobile batteries of a particular brand are:

2.4	1.9	2.0	2.1	1.8
2.3	2.1	2.3	1.7	2.0

Estimate the mean lifetime for all batteries, using a 95% confidence interval.

Question 5. (20 Marks)

a) A test was conducted to determine the length of time required for a student to read a specified amount of material. All students were instructed to read at the maximum speed at which they could still comprehend the material. Sixteen students took the test, with the following results (in minutes):

25, 18, 27, 29, 20, 19, 25, 24, 32, 21, 24, 19, 23, 28, 31, 22

Estimate the mean length of time required for all students to read the material, using a 95% confidence interval.

b) You were asked to compute a *95%* confidence interval. The resulting interval, however, turned out to be too large to be of use to your client. What could you do to achieve a smaller confidence interval?