East Los Angeles College
Department of Mathematics
Math 227
Test 4 and Final Exam Study Guide

The following data represents the math lab time (hours) that students spent the week before a final exam.

6, 5, 8, 6, 4, 6

1. Determine the mean. **Tenths**
2. Determine the variance. **Tenths**
3. Determine the standard deviation. **Tenths**
4. Use the 90% confidence level to estimate the margin of error associated with estimating the true mean. **Hundredths**
5. Use the 90% confidence interval to estimate the true mean study time. **Tenths**
6. Use the 90% confidence level to estimate the true variance. **Tenths**
7. Use the 90% confidence level to estimate the true standard deviation. **Tenths**

8. A $ 45,000 life insurance policy for a 28-year old male costs $ 1,500 per year. If the probability of a 28-year old male living to see 29 years of age is 0.95, compute the expected value for the insurance policy. **Hundredths**

Multiple Choice Quiz
There are 8 questions on a multiple-choice quiz in which each question has 4 possible answers (a), (b), (c), (d). If a person guesses on each question, what's the probability of guessing correct on: **Thousandths**

9. All the questions?
10. One question?
11. Two questions?
12. At least one question?
13 More than two questions?
14. What is the expected number of correct guesses?

Typically, California experiences a mean of 5.2 small Earthquakes (less than 2.0 on the Richter Scales) every hour. In the next 20 minutes, what's the probability California will experience:
15. No Small earthquakes? **Thousandths**
16. One small earthquake? **Thousandths**
17. Two small earthquakes? **Thousandths**
18. At least one small earthquake? **Thousandths**
19. No more than two small earthquakes? **Thousandths**

The lifespan of a laptop is normally distributed with a mean of 6.5 years and a standard deviation of 1.6 years. What percent of laptops last:

20. At least 5 years? **Hundredths**
21. Less than 8 years? **Hundredths**
22. Between 6 and 9 years? **Hundredths**
23. More than 5 years? **Hundredths**
24. What lifespan represents the top 5%? **Tenths**

When reviewing health records, a sample of size 280 indicates that 46% of Americans over the age of 45 suffer from type II diabetes. Use the 95% confidence level to:

25. Estimate the margin of error. **Thousandths**
26. Estimate the true proportion. **Thousandths**
27. If you are conducting a new study using the 95% confidence level and no prior sample proportion information is known, estimate the sample size needed to be within a margin of error of $\pm 3\%$

Covid-19 If there are 50,000 cases in a State of 10,000,000 people.

28. What is the probability of getting Covid-19 in that State? Approximate your answer to the nearest thousandths.
29. What's the probability of **not** getting infected with Covid-19?

Covid-19 Infection Rates by Gender

	Male	**Female**	Total
Infected	65	52	117
Not infected	2600	3200	5800
Total	2665	3252	5917

If a person is selected at random, what's the probability the person:

30. is infected? **Thousandths**
31. is infected **given that** the person is a male? **Thousandths**
32. is infected **given that** the person is a female? **Thousandths**
33. Which gender is more likely to be infected?
34. If two different people are selected, what's the probability at least one is infected?

Sick Days

The mean amount of sick days faculty take per year is at least 4 days. A sample of of 120 faculty members report a mean of 5.2 with a standard deviation of 1.1 days. Use the 5% level of significance answer the following questions.

35. What is the claim?
36. What are your critical value(s)?
37. What is your test statistic?
38. What is your conclusion?

Car and Taxi Ages

The mean age of cars is no more than 12 years. A sample of 22 cars reveal a mean age of 10.2 years with a standard deviation of 2.6 years. Use the 10% level of significance to answer the following questions.

39. What is the claim?
40. What are your critical value(s)?
41. What is your test statistic?
42. What is your conclusion?

Covid-19 Vaccine

The proportion of people who benefit from vaccine X is greater than the 90%. A sample of 350 people who take vaccine x report an infection rate of 92% Use the 5% level of significance answer the following questions.

43. What is the claim?
44. What are your critical value(s)?
45. What is your test statistic?
46. What is your conclusion?

Covid-19 Days Contagious

People who take the XYZ medication report being contagious for less days than 12 days. A sample of 120 people who take xyz are contagious for 11.2 days with a standard deviation of 1.8 days Use the 10% level of significance to answer the following questions.

47. What is the claim?
48. What are your critical value(s)?
49. What is your test statistic?
50. What is your conclusion?

Answer Sheet

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