

Name : _____

Directions: This exam contains four problems worth a total of 100 points. For each computational problem, you must first write the formula to be used and present all your subsequent work in order to receive full or partial credit. Circle your final answers.

1. It is claimed that the distribution of monthly parking fees in a city is normal with a mean of \$65.00. In order to test the truth of this claim, you randomly sampled 26 residents in the city and asked them how much they pay for parking each month. The mean was \$62.50 with a standard deviation of \$5.00.

- (a) With an alpha level of .05, conduct the test of interest. (15 pts.)

H_0 : _____ vs. H_a : _____

Compute the test statistic and define the rejection rule.

Should the null hypothesis be rejected? Circle one. Yes No

- (b) The test in (a) *should* reject the null hypothesis. If the same test were conducted at the significance level of .10, would it reject or retain the null hypothesis? No computation is necessary to answer this question. (10 pts.)

2. The waiting time until you find a parking spot in a busy parking lot has a skewed distribution with mean $\mu = 3.20$ minutes and standard deviation $\sigma = 1.15$.

- (a) Suppose that you visit this parking lot 40 times and compute the mean waiting time. What distribution will the mean waiting time have, and what theorem assures such a result? (10 pts.)

- (b) If you visit this parking lot 40 times, what is the probability that the mean waiting time will be longer than 3.00 minutes? (10 pts.)

3. Okura is packed by a local farmer and shipped to a nearby grocer. The label on the package says “Fresh Okura 14 oz.” Of course, this “14 oz.” is an approximate value, and no package contains exactly 14 ounces of okura. You will collect data on the weight of the package content and estimate the true mean. Assume that the standard deviation is known to be 0.45 ounce.
- (a) In order for your estimate of the mean to be within 0.12 ounce of the true value with 95% certainty, how many packages should you observe? (10 pts.)
- (b) Suppose that a random sample of 35 packages yielded a mean weight of 14.24 ounces. Estimate the true mean using a 95% confidence interval. (10 pts.)
4. According to a survey conducted with 132 adults by a sociology student, 97 indicated that they were satisfied with their jobs.
- (a) Conduct a test of hypotheses to determine whether more than 70% of the people are satisfied with their jobs. Use a significance level of .01. (15 pts.)

H_0 : _____ vs. H_a : _____

Compute the test statistic and define the rejection rule.

Should the null hypothesis be rejected? Circle one. Yes No

- (b) For the test conducted in (a), regardless of what you actually computed, suppose that the test statistic was $z^* = 0.85$. Compute the p -value of the test. (10 pts.)
- (c) For the test in (a), one assumption required is that the sampling distribution of the sample proportion, p , is approximately normal. Check whether this assumption appears to be satisfied. (10 pts.)