MGT 2250 Management Statistics

Sample Final Part 3

1. Between quarterly audits, a company checks its accounting procedures to detect problems before they become serious. The accounting staff processes payments on about 120 orders each day. The next day a supervisor checks 10 of the transactions to be sure they were processed properly.

- (a) Propose a sampling strategy for the supervisor.
- (b) How would you modify the sampling strategy if the company makes both wholesale and retail sales that require different bookkeeping procedures?

2. A sample of 150 calls to a customer help line during one week found that callers were kept waiting on average for 16 minutes with s=8.

- (a) Find the margin of error for this result if we use a 95% confidence interval for the length of time all customers during this period are kept waiting.
- (b) Interpret for management the margin of error.
- (c) If we only need to be 90% confident, does the confidence interval become wider or narrower?
- (d) Find the 90% confidence interval.

3. A company that stocks shelves in supermarkets is considering expanding the supply that it delivers. Items that are not sold must be discarded at the end of the day, so it only wants to schedule additional deliveries if stores regularly sell out. A break-even analysis indicates that an additional delivery cycle will be profitable if items are selling out in more than 60% of markets. A survey during the last week in 45 markets found the shelves bare in 35.

- (a) State the null and alternative hypotheses.
- (b) Describe a Type I error and a Type II error in this context.
- (c) Find the *p*-value of the test. Do the data supply enough evidence to reject the null hypothesis if the α -level is 0.05?

4. Damage. A cosmetics firm uses two different shipping companies. Shipper A is more expensive, but managers believe that fewer shipments get damaged than when shipped the current shipper used by the firm, Shipper B. To compare the shippers, the company devised the following comparison. The next 450 shipments to outlet stores were randomly assigned to Shipper A or to Shipper B. Upon receipt, an agent at the store reported whether the shipment had suffered noticeable damages. Because shipping with Shipper A is more expensive, a financial calculation showed that Shipper A needs to have at least 10% fewer damaged shipments than Shipper B for Shipper A to improve profits.

- (a) How would you randomly assign the shipments to Shipper A or to Shipper B?
- (b) Does the data show that shipping with Shipper A exceeds the needed threshold by a statistically significant amount?
- (c) Is there a statistically significant difference between the damage rates?