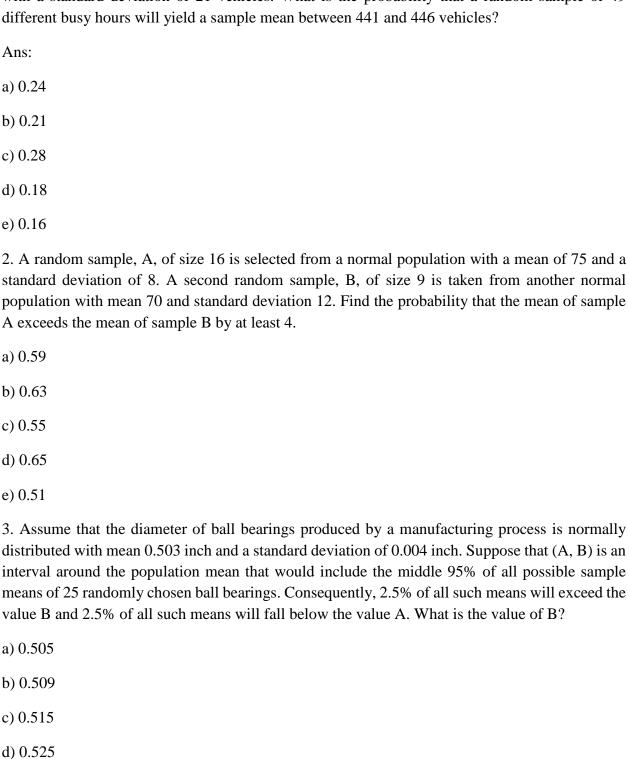1. Suppose that during any busy hour in a large parking lot the average number of vehicles is 448, with a standard deviation of 21 vehicles. What is the probability that a random sample of 49 different busy hours will yield a sample mean between 441 and 446 vehicles?

Ans:

a) 0.24

b) 0.21

c) 0.28

d) 0.18

e) 0.16

2. A random sample, A, of size 16 is selected from a normal population with a mean of 75 and a standard deviation of 8. A second random sample, B, of size 9 is taken from another normal population with mean 70 and standard deviation 12. Find the probability that the mean of sample A exceeds the mean of sample B by at least 4.

a) 0.59

b) 0.63

c) 0.55

d) 0.65

e) 0.51

3. Assume that the diameter of ball bearings produced by a manufacturing process is normally distributed with mean 0.503 inch and a standard deviation of 0.004 inch. Suppose that (A, B) is an interval around the population mean that would include the middle 95% of all possible sample means of 25 randomly chosen ball bearings. Consequently, 2.5% of all such means will exceed the value B and 2.5% of all such means will fall below the value A. What is the value of B?

a) 0.505

b) 0.509

c) 0.515

d) 0.525

e) 0.501

4. Find k such that P (-2.977<T<k) = 0.045 for a sample size of 15. Assume that T follows t-distribution.

a) -1.761

b) 1.457

c) 2.992

d) 0

e) -1.671

5. Certain type of batteries will last, on average, 3 years with a standard deviation of 2.646 months. A random sample of 5 batteries is used to routinely check the variability in lifetimes. Determine the value of the sample variance which will be exceeded only 5% of the time?

a) 17

b) 8

c) 9

d) 14

e) 10

6. Find the probability that a random sample of 25 observations, from a normal population with standard deviation 2.45 will have a sample variance between 3.463 and 10.745.

a) 0.94

b) 0.86

c) 0.78

d) 0.9

e) 0.8