**Question 1:**

**A)**

mean = 37;

sigma = 5;

n = 15;

ME = 1.645\*sigma/sqrt(n);

CI = {mean-ME,mean+ME}

Output:

CI =  
  
 34.8763 39.1237

**Ans:** 90% confidence interval for μ = {34.8763 , 39.1237}

**B)**

mean = 37;

sigma = 5;

n = 15;

ME = 1.96\*sigma/sqrt(n);

CI = [mean-ME,mean+ME]

Output:

CI =  
  
 34.4697 39.5303

**Ans:** 95% confidence interval for μ = {34.4697, 39.5303}

**C)**

mean = 37;

sigma = 5;

n = 15;

ME = 2.576\*sigma/sqrt(n);

CI = [mean-ME,mean+ME]

Output:

CI =  
  
 33.6744 40.3256

**Ans:** 95% confidence interval for μ = {33.6744, 40.3256}

**D)**

As you increase the level of confidence of the interval, the lower bound of the interval decreases, while the upper bound increases in value. In general, the bounds distance from the mean increases.

**Question 2:**

**A)**

mean = 270;

sigma = 40;

n = 25;

ME = 1.96\*sigma/sqrt(n);

CI = [mean-ME,mean+ME]

**Output:**

CI =  
  
 254.3200 285.6800

**Ans:** 95% confidence interval for μ = {254.32, 285.68}

**B)**

mean = 270;

sigma = 40;

n = 50;

ME = 1.96\*sigma/sqrt(n);

CI = [mean-ME,mean+ME]

**Output:**

CI =  
  
 258.9126 281.0874

**Ans:** 95% confidence interval for μ = {258.9126, 281.0874}

**C)**

mean = 270;

sigma = 40;

n = 100;

ME = 1.96\*sigma/sqrt(n);

CI = [mean-ME,mean+ME]

**Output:**

CI =  
  
 262.1600 277.8400

**Ans:** 95% confidence interval for μ = {262.16, 277.84}

**D)**

As the sample size increases with a constant confidence level, the confidence interval bounds become tighter in respect to the mean. The lower bound increases while the upper bound decreases, since the margin of error decreases.

**Question 3:**

**A)**

mean = 850;

sigma = 50;

n = 100;

ME = 1.96\*sigma/sqrt(n);

CI = [mean-ME,mean+ME]

**Output:**

CI =  
  
 840.2000 859.8000

**Ans:** 95% confidence interval for μ = {840.2, 859.8}

**B)**

mean = 850;

sigma = 100;

n = 100;

ME = 1.96\*sigma/sqrt(n);

CI = [mean-ME,mean+ME]

**Output:**

CI =  
  
 830.4000 869.6000

**Ans:** 95% confidence interval for μ = {830.4, 869.6}

**C)**

mean = 850;

sigma = 200;

n = 100;

ME = 1.96\*sigma/sqrt(n);

CI = [mean-ME,mean+ME]

**Output:**

CI =  
  
 810.8000 889.2000

**Ans:** 95% confidence interval for μ = {810.8, 889.2}

**D)**

As the sample size increases with a constant confidence level, the confidence interval bounds become tighter in respect to the mean. The lower bound increases while the upper bound decreases, since the margin of error decreases.