**S6.11** Twelve sample, each containing five parts,were taken from a process that produces steel rods. The length of each rod in the samples was determined. The results were tabulated and sample means and ranges were computed. The results were:

**DRIVEANT**

**ISSUES11111**

**ELECTRICAL/**

**PLUMBING**

SAMPLE SAMPLE MEAN (in) RANGE (in)

1 10.002 0.011

2 10.002 0.014

3 9.991 0.007

4 10.006 0.022

5 9.997 0.013

6 9.999 0.012

7 10.001 0.008

8 10.005 0.013

9 9.995 0.004

10 10.001 0.011

11 10.001 0.014

12 10.006 0.009

1. Determine the upper and lower control limits and the overall means for x-charts and R-charts.
2. Draw the charts and plot the values of the sample means and ranges.
3. Do the data indicate a process that is in control?
4. Why or why not?