A normally distributed quality characteristic is monitored through the use of control charts. These charts have the following parameters. All charts are in control.

	LCL	Centre Line	UCL
$\bar{X}$-Chart	614	620	626
R-Chart	0	8.236	18.795

i. (2 marks) What sample size is being used for this analysis?

ii. (2 marks) Estimate the mean of the standard deviations $\bar{s}$ for this process.

iii. (2 marks) Compute the control limits for the process standard deviation chart (i.e. the s-chart).

- Process Mean

$$\bar{\bar{x}} \pm 3\frac{\bar{s}}{c_4\sqrt{n}}$$

- Process Standard Deviation

$$\bar{s} \pm 3\frac{c_5\bar{s}}{c_4}$$

- Process Range

$$[\bar{R}D_3, \bar{R}D_4]$$

Sample size n	c4	c5	d2	d3	D3	D4
2	0.7979	0.6028	1.128	0.853	0	3.267
3	0.8862	0.4633	1.693	0.888	0	2.574
4	0.9213	0.3889	2.059	0.88	0	2.282
5	0.94	0.3412	2.326	0.864	0	2.114
6	0.9515	0.3076	2.534	0.848	0	2.004
7	0.9594	0.282	2.704	0.833	0.076	1.924
8	0.965	0.2622	2.847	0.82	0.136	1.864

- Process Mean

$$\bar{\bar{x}} \pm 3\frac{\bar{s}}{c_4\sqrt{n}}$$

- Process Standard Deviation

$$\bar{s} \pm 3\frac{c_5\bar{s}}{c_4}$$

- Process Range

$$\left[\bar{R}D_3, \bar{R}D_4\right]$$