Exercises: 2

Q1- A study of pieces produced by a certain machine shows the following measurements. These are taken in 10 subgroups of 5 each. i) Determine the trial control limits for (X & R) charts. ii) Construct and discuss trial (X & R) control charts

1	2	3	4	5	6	7	8	9	10
12.62	12.63	12.62	12.61	12.59	12.57	12.57	12.58	12.61	12.56
12.62	12.56	12.56	12.66	12.58	12.63	12.56	12.57	12.60	12.59
12.60	12.60	12.57	12.62	12.57	12.60	12.61	12.60	12.62	12.62
12.61	12.59	12.58	12.61	12.59	12.59	12.59	12.62	12.60	12.60
12.65	12.60	12.63	12.60	12.60	12.59	12.60	12.60	12.65	12.54

Q2- The following is a table gives the means and ranges of samples of five of each. Data pertains to the length of keyways measurements are in (mms). i) Find trial control limits of (X & R charts) ii) Draw this (X & R charts) iii) Discuss the results.

Subgroup No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
X	3.74	3.48	4.84	3.82	3.68	3.6	3.82	3.64	3.8	3.78
R	0.15	0.18	0.18	0.11	0.12	0.12	0.18	0.10	0.17	0.19

Q3- Control charts for (X and R) are to be established on a certain dimension part, measured in millimetres. Data were collected in subgroup sizes of 5 and are given below. i) Determine the trial control limits for (X & R) charts. ii) Construct and discuss trial (X & R) control charts iii) If there are any out-of-control points, assume an assignable cause and determine the revised control limits.

Subgroup No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
X	4.22	4.19	4.26	4.34	4.30	4.22	4.30	4.48	4.59	4.49
R	0.30	0.14	0.26	0.27	0.24	0.12	0.17	0.50	0.23	0.58

Subgroup No.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
X	4.52	4.40	4.29	4.31	4.27	4.46	4.62	4.33	4.32	4.49
R	0.23	0.62	0.38	0.28	0.09	0.22	0.20	0.17	0.40	0.20