

(\bar{X} -R Chart)

3-7

4

30

(5-4)

()				
	1	2	3	4
1	16	18	21	23
2	26	20	19	19
3	20	22	18	18
4	24	16	22	20
5	17	19	24	17
6	17	17	15	18
7	22	12	20	22
8	24	19	19	17
9	18	18	20	14
10	17	23	19	15
11	20	20	17	21
12	21	17	21	23
13	22	17	22	17
14	16	19	18	19
15	17	18	15	23
16	19	17	21	17
17	19	19	13	16
18	21	14	17	16
19	18	17	25	18
20	20	18	20	19
21	23	21	23	21
22	20	20	20	14
23	18	18	26	15
24	20	22	23	21
25	23	22	21	24
26	22	14	21	19
27	18	20	18	22

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28	19	20	16	14
29	21	19	16	20
30	22	22	18	21

5-4

(\bar{X} -R Chart)

(5-4)

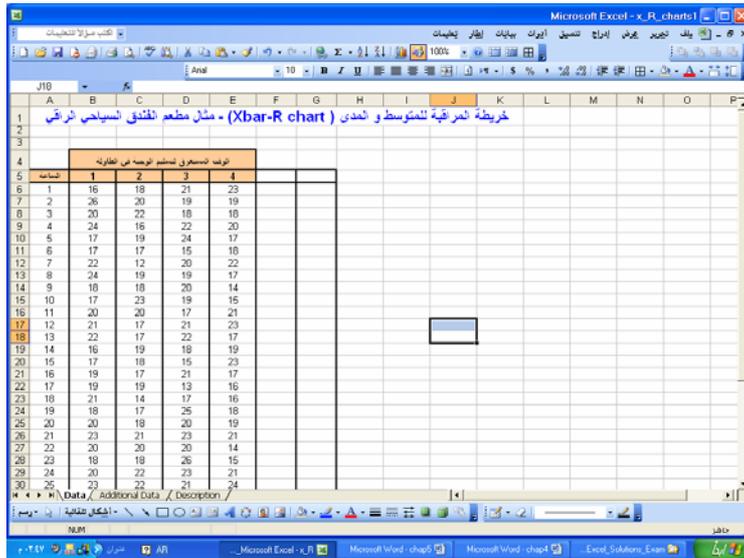
E , D, C,)

()

A

(9-4)

(B



9-4

(fx)

R

(F6)

1

(F)

.7

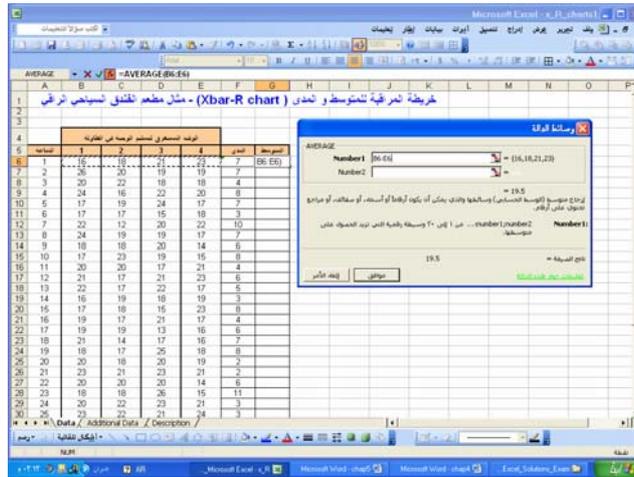
(MAX(B6:E6)-MIN(B6:E6))

=

(F35)

(F7)

(G) (AVERAGE) = (G6) (B6:E6) ((10-4)) (Enter) (6-4) (G35) (G7)



10-4

$(\bar{R} = 0.73)$ K12 = AVERAGE(F6:F35)

K15 = AVERAGE(G6:G35)

$\bar{X} = 19.29:$

	1	2	3	4		
1	16	18	21	23	7	19.50
2	26	20	19	19	7	21.00
3	20	22	18	18	4	19.50
4	24	16	22	20	8	20.50
5	17	19	24	17	7	19.25
6	17	17	15	18	3	16.75
7	22	12	20	22	10	19.00
8	24	19	19	17	7	19.75
9	18	18	20	14	6	17.50

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10	17	23	19	15	8	18.50
11	20	20	17	21	4	19.50
12	21	17	21	23	6	20.50
13	22	17	22	17	5	19.50
14	16	19	18	19	3	18.00
15	17	18	15	23	8	18.25
16	19	17	21	17	4	18.50
17	19	19	13	16	6	16.75
18	21	14	17	16	7	17.00
19	18	17	25	18	8	19.50
20	20	18	20	19	2	19.25
21	23	21	23	21	2	22.00
22	20	20	20	14	6	18.50
23	18	18	26	15	11	19.25
24	20	22	23	21	3	21.50
25	23	22	21	24	3	22.50
26	22	14	21	19	8	19.00
27	18	20	18	22	4	19.50
28	19	20	16	14	6	17.25
29	21	19	16	20	5	19.00
30	22	22	18	21	4	20.75

6-4

K19

$$\begin{aligned} & \cdot \\ & \cdot (UCL_R=13.08) = 2.282 * K12 : \\ & \cdot (LCL_R=0) = 0 * K12 : \quad K21 \end{aligned}$$

K25

$$\begin{aligned} & \cdot \\ & \cdot (UCL_X=23.42) = K15 + 0.729 * K12 : \\ & \cdot (LCL_X=15.06) = K15 + 0.729 * K12 : \quad K25 \end{aligned}$$

.(12-4)

(11-4)

