1	(a)	**19.7**
	(b)	**(i) 0.9938, (ii)=0.3944**
	(d)	**Ho μ=3.2 hrs, Ha μ≠ 3.2 hrs**
2	(a)	**0.5298**
	(b)	**As calculated F=7.5>3.8853 So, H0 is rejected, Hence there is significant differentiation between samples.**
3	(b)	**While for a right tailed chi-square test with 95% confidence level, and df =3, critical χ^2 value is 7.81. Calculated χ^2 value is greater than the critical value of $\chi^2$for a 0.05 significance level. $\chi^2_{calculated} > \chi^2_{critical}$ hence reject the null hypotheses.**
4	(a)	**0.7745 or (-.7745)**
	(b)	**b1=0.038033, b2=-0.10261, a=1.381846, Y=1.38+(0.038*X1)-0.1*X2)**
5	(a)	**H0: μ ≤ 145 Ha: μ > 145, The critical value will be 1.645. We will reject the null hypothesis if the test statistic is greater than 1.645. The value of the test statistic is 0.24. This is less than 1.645 and so our decision is to fail to reject H0.**
	(b)	**b1=8.1, b0=-3.53, y=-3.53+(8.1*x)**
6	(a)	**(i) 0.132, (ii) 0.791, (iii) 0.164**

2(b)

A	25	625	160	5120									
A	30	900						correction factor =		230400	15360		
A	36	1296											
A	38	1444											
A	31	961						total sum =		450			
B	31	961	185	6845									
B	39	1521						SSB=		250			
B	38	1444											
B	42	1764						ANOVA					
B	35	1225						Source of Varia	SS	df	MS	F	Table value
C	24	576	135	3645				Between Group	250	2	125	7.49	3.89
C	30	900						Within Groups	200	12	16.67		
C	28	784						Total	450	14			
C	25	625											
C	28	784											
	480	15810		15610									

3(b)

- Null Hypothesis H_0: The distribution of operator scores are same
- Alternative Hypothesis H_1: The scores may vary in four facilities

Rank the score in all the facilities

	Facility 1	Facility 2	Facility 3	Facility 4
	88(16)	77(10)	71(8)	52(2)
	82(12)	76(9)	56(3)	65(6)
	86(14)	84(13)	64(5)	68(7)
	87 (15)	59 (4)	51 (1)	81 (11)
T_i	57	36	17	26

N=16

$$H = \frac{12}{N(N+1)} \sum \frac{T_i^2}{N_i} - 3(N+1)$$

$$H = \frac{12}{16(17)} (\frac{57^2 + 36^2 + 17^2 + 26^2}{4}) - 3(17)$$

$$H = \frac{12}{16(17)} \left(\frac{5510}{4}\right) - 3(17) = 9.77$$

While for a right tailed chi-square test with 95% confidence level, and df =3, critical χ^2 value is 7.81

	Area in the Right Tail									
	0.999	0.995	0.990	0.975	0.950	0.900	0.100	0.050	0.025	0.010
Degrees of Freedom										
1	0.000	0.000	0.000	0.001	0.004	0.016	2.706	3.841	5.024	6.635
2	0.002	0.010	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210
3	0.024	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345
4	0.091	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277
5	0.210	0.412	0.554	0.831	1.145	1.610	9.236	11.070	12.833	15.086
6	0.381	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812

Calculated χ^2 value is greater than the critical value of $\chi^2$for a 0.05 significance level.
$\chi^2_{calculated} > \chi^2_{critical}$ hence reject the null hypotheses.

6(a)

1. All five people are still living.

$B(5, \frac{2}{3}) \qquad p = \frac{2}{3} \qquad 1 - p = \frac{1}{3}$

$p(X = 5) = \binom{5}{5}(\frac{2}{3})^5 = 0.132$

2. At least three people are still living.

$$p(X \geq 3) = p(X = 3) + p(X = 4) + p(X = 5)$$

$$= \binom{5}{3}\left(\frac{2}{3}\right)^3\left(\frac{1}{3}\right)^2 + \binom{5}{4}\left(\frac{2}{3}\right)^4\left(\frac{1}{3}\right) + \binom{5}{5}\left(\frac{2}{3}\right)^5 = 0.791$$

3. Exactly two people are still living.

$$p(X = 2) = \binom{5}{2}\left(\frac{2}{3}\right)^2\left(\frac{1}{3}\right)^3 = 0.164$$