Chapter 17

Note: wherever possible, values used in the solutions below are taken directly from the SAS output provided in the text.

1. a

Treatment	Mean	Std. Deviation
1	7.5	1.643
2	5	1.265
3	4.333	1.033
4	5.167	1.472
5	6.167	2.041

Overall Mean: $\bar{Y}$ =5.633

b ANOVA table

Source	df	SS	MS	F
Treatment	4	36.467	9.117	3.90
Error	25	58.50	2.34	
Total	29	94.967		

c H_0: $\mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = 0$ H_A: at least two treatment means are different.

$$F = \frac{9.117}{2.34} = 3.896 \ (4, 25 \text{ df}) \quad P = 0.0136$$

At α=0.05 we reject H_0 and conclude that at least two treatments have different population means

d Estimates of true effects (μ_i - μ) where μ is the overall mean, i.e.

$\mu = \frac{1}{5}\sum_{i=1}^{5} \mu_i$, μ_i =the population mean for the i^{th} treatment:

Treatment (i)	$\bar{Y}_i - \bar{Y}$
1	1.8667
2	-0.6333
3	-1.3000
4	-0.4667
5	0.5333

Total $\sum_{i=1}^{5}(\bar{Y}_i - \bar{Y}) = 0.000$