**3.10.** A product developer is investigating the tensile strength of a new synthetic fiber that will be used to make cloth for men’s shirts. Strength is usually affected by the percentage of cotton used in the blend of materials for the fiber. The engineer conducts a completely randomized experiment with five levels

of cotton content and replicates the experiment five times. The data are shown in the following table.

(**a**) Is there evidence to support the claim that cotton content affects the mean tensile strength? Use

α = 0.05.

From the SAS output below and the do by hand we can see that the calculated F statistic is F = 14.76 with degrees of freedom 4 and 20. The P-Value is less than .001 (by the calculator the P-Value is 0.000009) which is less than α = .05. We can conclude that at east one of the means are different.

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Value** | **Pr > F** |
| --- | --- | --- | --- | --- | --- |
| **Model** | 4 | 475.7600000 | 118.9400000 | 14.76 | <.0001 |
| **Error** | 20 | 161.2000000 | 8.0600000 |  |  |
| **Corrected Total** | 24 | 636.9600000 |  |  |  |

(**b**) Use the Fisher LSD method to make comparisons between the pairs of means. What conclusions can you

draw?

(**c**) Analyze the residuals from this experiment