

Microquiz 3

1. In a single factor experiment, 5 treatments are replicated 3 times each. It was found that $SS_T = 10000$ and $SS_{\text{Treatments}} = 9000$. What is the value of the estimated model variance $\hat{\sigma}^2$?

- a) 100
- b) 250
- c) 500
- d) 1000
- e) 5000

2. In a single factor experiment, with 4 levels of the factor and 4 replications, the P-value for the Fisher LSD test on the difference of μ_1 and μ_2 was found to be equal to 0.04. Which of the following is a possible P-value for the same pairwise comparison using the Tukey's test? *Hint: recall that the Tukey's test is stricter and thus would interpret any data as a weaker evidence.*

- a) 0
- b) 0.03
- c) 0.04
- d) 0.05
- e) 1

3. Which of the following is a contract orthogonal to $\Gamma_1 = \mu_1 + \mu_2 - \mu_3 - \mu_4$?

- a) $\Gamma_2 = \mu_1 + \mu_2$
- b) $\Gamma_2 = \mu_1 - \mu_2$
- c) $\Gamma_2 = \mu_1 - \mu_3$
- d) $\Gamma_2 = \mu_1 - \mu_4$
- e) $\Gamma_2 = \mu_1 + \mu_2 - 2\mu_3$

4. An engineer wants to design an single factor experiment with 4 levels so that, if any difference D between any two means is at least 10.0, it would be able to detect that with probability of at least 0.90. Her starting guess is that 4 replications would be enough for that. What is the corresponding value of the difference parameter Φ^2 assuming the model variance σ^2 is equal to 25.0?

- a) 1.0
- b) 1.5
- c) 2.0
- d) 3.0
- e) 5.0