**Quiz VI – Random Factors**

Part I – Individual Quiz (Before Class)

Part II – Group Quiz (During Class)

1. Did you complete the reading (6 points)?

YES

1. When is a factor random? When is it fixed? ( 2 points)

Random = sample, fixed = population

1. What is the null hypothesis for a random factor (2 points)?

αc = αA = αM = 0

1. What are the 5 imperfect but useful generalizations for determining if a factor is random (2 points)?

Units should always be random.

Blocks are usually random.

Nuisance factors are usually random.

Nested factors are usually random.

Factors of interest that are experimental are usually fixed.

1. What does the Expected Mean Square (EMS) for a factor tell you (2 points)?

The expected values for all the mean squares for a design are built from the same set of pieces, one piece for each factor.

1. State the “random, inside rule” for finding EMS (2 points).

The EMS for a factor contains a term for the factor itself, plus a term for each Random inside factor.

1. How do you find the denominator Mean Squares for testing a factor (2 points)?

Find the MS whose expected value has exactly the same terms as the EMS for the factor you want to test

**End of Part I**

1. Were you in class on time (2 pts)?

No

10 Dogs are randomly assigned to have their pancreas removed or not. Then each dog is infused chemical and their lactic acid is measured. They are then injected with the chemical and their lactic acid is measured again (the order of infusing and injecting is randomized).

Identify the factors that contribute variance to each factor (i.e. the EMS) and identify which Mean Squares should be used in the denominator of an F test for each factor: (10 points)

|  |  |  |
| --- | --- | --- |
| **Factor** | **EMS** | **MS to use in Denominator of F calc.** |
| Operation | Op + dog + error | MSDog |
| Dog (random) | Dog + Error | MSerror |
| Method | Method + Error | MSerror |
| Operation x Method | OP \* Method + error | MSerror |
| Error | Error | MSerror |