

QUEEN MARY, UNIVERSITY OF LONDON

MAS 314

Design of Experiments

Assignment 3

For discussion on 30 January 2007

1 A marine engineer is investigating ways of treating the standard metal components used in the construction of underwater structures at sea, such as piers and oil-drilling platforms. He wants to protect them against corrosion.

A colleague has developed a new sort of paint for the components. The engineer would like to see whether two coats of this paint give better protection than a single coat. So he will paint some metal components once, some twice, then immerse them all in his experimental tank of sea water. After three months, he will remove all the metal components from the tank, and measure the amount of corrosion on each.

He has a virtually unlimited supply of the metal components. The tank has room for up to 30 components. However, the paint is new, and there is enough for only 24 coats of paint.

Advice the engineer how best to use his resources in his experiment.

2 Look at the Genstat output for Question 7 of Practical 3. Explain what Genstat is doing when the Treatment Structure is `control/tmt`. What hypothesis tests can you do using the analysis-of-variance table? How?