UNIVERSITY OF CALIFORNIA SANTA BARBARA

DEPARTMENT OF CHEMICAL ENGINEERING

CHE 152B: Advanced Process Control

Winter Quarter 2010 Homework # 7

(Due Mar 10, 2010)

1) Use PCM/Diabetes/Bergman to model the glucose response to changes in the rates of insulin and glucose infusion

a. Estimate the parameters of a step response model

b. Determine appropriate move and prediction horizons for a single input single output MPC algorithm using insulin infusion as a manipulated variable

2) Use PCM/Diabetes/MPC to tune the test an MPC with weights on the control moves of 0.1, 1, and 10. Test the controller performance when used to:

a. Track setpoint changes of +/- 20 mg/dL

b. Reject disturbances of 50 g CHO