

**ANSWER KEY - LABORATORY EXERCISE 15
CHARACTERISTICS OF CASCADE CONTROL**

2. CASCADE LOOP SET UP

Secondary Controller

Is it appropriately fast? Yes

Primary Controller

Is it approximately quarter decay? Yes

Period of oscillation? 12 minutes

3. CASCADE LOOP OPERATION

Initial Conditions

Primary process variable 275 DegF

Secondary controller set point 280 P/hr

Secondary controller output 35%

After primary load change

Maximum deviation from set point 5.7 Deg

Did the primary PV return to SP? Yes

Secondary controller set point 320 P/hr

Secondary controller output 40%

After secondary load change

Maximum deviation from set point 1.4 Deg

Did the primary PV return to SP? Yes

Secondary controller set point 280 P/hr

Secondary controller output 41.3%

4. NON-CASCADE CONTROL OPERATION

Are the tuning parameters the same ...?	Yes
... bump the process?	No
After primary load change	
Maximum deviation from set point	7.1 Deg
Is this response approximately the same ...?	Yes
After secondary load change	
Maximum deviation from set point	11.8 Deg
Is this reponse approximately the same ...?	No
Is the response approximately the same ... as the response to a primary load upset?	Same