EE 422 Mathematical Economics 2 (1/2016)

Assignment 3

The due date for this assignment is (Wednesday) 28th September 2016.

1. Find the general solution, and the definite solution of the following differential equations: (10 points each)

   a) $y''(t)+3y'(t)-4y=12;\quad y(0)=4, y'(0)=2$

   b) $y''(t)+6y'(t)+5y=10;\quad y(0)=4, y'(0)=2$

   c) $y''(t)-2y'(t)+y=3;\quad y(0)=4, y'(0)=2$

   d) $y''(t)+8y'(t)+16y=0;\quad y(0)=4, y'(0)=2$

   e) $y''(t)-4y'(t)+8y=0;\quad y(0)=3, y'(0)=7$

   f) $y''(t)+4y'(t)+8y=2;\quad y(0)=2\frac{1}{4}, y'(0)=4$

   g) $y''(t)+3y'(t)+4y=12;\quad y(0)=2, y'(0)=2$

   h) $y''(t)-2y'(t)+10y=5;\quad y(0)=6, y'(0)=8\frac{1}{2}$

2. Find the general solution of the following differential equations: (10 points each)

   a) $y'''(t)-2y''(t)-y'(t)+2y=4$

   b) $y'''(t)+7y''(t)+15y'(t)+9y=0$

   c) $y'''(t)+6y''(t)+10y'(t)+8y=8$

3. Find the definite solution of the following difference equations: (5 points each)

   a) $y_{t+1}+3y_t=4 \qquad (y_0=4)$

   b) $2y_{t+1}-y_t=6 \qquad (y_0=7)$

   c) $y_{t+1}=0.2y_t+4 \qquad (y_0=4)$

4. Find the definite solution of the following difference equations. Also draw as well as analyze the time paths, i.e. the time path is oscillatory and convergent: (10 points each)

   a) $y_{t+1}-\frac{1}{3}y_t=6 \qquad (y_0=1)$

b) $y_{t+1} + 2y_t = 9 \qquad (y_0 = 4)$

c) $y_{t+1} + \frac{1}{4} y_t = 5 \qquad (y_0 = 2)$

d) $y_{t+1} - y_t = 3 \qquad (y_0 = 5)$