MATH4511 HW2 : Leung Ko Tsun 20516287

4.1:

There are 89 days between 2/15/2001, and 5/15/2001. There are 181 days between 2/15/2001 and 8/15/2001. Therefore, the accrued interest on this bond is

89/181 * 5/2 = 1.229282

And the invoice price on $100,000 is $100,000 * (96 – 23 $^1/_2$ + 1.229282) / 100 = $97,963.66

2.2 Solving the following equation, we have:

$100 * (1 + r/2) ^6 = $120

r = 6.1707%, so the return is 6.1707%.

2.3 using the following equation:

$$\hat{y}(t) = 2\left(\frac{1}{d(t)^{1/2t}} - 1\right)$$

when $t = 0.5$, resulting spot rate $= 3.822\%$.

when $t = 1$, resulting spot rate is 3.997%.

when $t = 1.5$, resulting spot rate is 4.230%.

3.2 The required yield is 4.9642.

3.7 a).

The value of the annuity over 25 years is

$$\frac{\$25{,}000}{0.03} \times \left[1 - \left(\frac{1}{1.03}\right)^{30}\right] =$$

$$\$643{,}244.$$

For 15 years, the value of annuity becomes:

$$\frac{\$25{,}000}{0.03} \times \left[1 - \left(\frac{1}{1.03}\right)^{30}\right] =$$

$$\$490{,}011$$

∴ the woman should buy the annuity at \$575,000 if she expects to live 25 years, but not if she expects to live 15 years.