

Name:

Fin 350

Quiz 2

1. Assume that the annual riskless rate of interest is 7.5%. Calculate the NPV of the following **riskless** investment, and, based on your calculation, decide whether you should take it on. Invest \$7000 today and receive \$3,000 at the end of every year for the next 40 years.[3]

$$\begin{aligned} NPV &= \frac{3,000}{0.075} \left(1 - \left(\frac{1}{1.075} \right)^{40} \right) - 7,000 \\ &= 30,783.20 \end{aligned}$$

Take on the investment

2 The treasury issues a 30 year bond in January 1995 with a 8% coupon. Two years later the bond yields 10%. What is its price just after the coupon is paid? (Hint: Recall that T-bonds pay **semi-annual** coupons.)[3]

$$\begin{aligned} P &= \frac{4}{0.05} \left(1 - \frac{1}{(1.05)^{56}} \right) + \frac{100}{(1.05)^{56}} \\ &= 81.301 \end{aligned}$$

Name:

3 The treasury had decided to issue a consol bond, that is, a T-bond with perpetual **semi-annual** coupon payments. The first such bond that is issued has a coupon of 8% (like all treasuries, we will assume it has a face of \$100). Five years later the bond sells for \$95. What is its yield-to-maturity (“yield”) just after the coupon is paid? (Hint: Recall that T-bonds pay **semi-annual** coupons.[3])

The yield is the rate that sets the PV of the cashflows equal to the current price, so,

$$95 = \frac{4}{r}$$
$$r = 4.21 \%$$

Converting to an APR quote

$$y = 4.21\% \times 2 = 8.42\%$$

4 *In one sentence*, explain how you can get the value of a 10 year annuity paying \$100 annually from the value of two perpetuities. Include in your explanation **precisely** which two perpetuities you are using.[1]

Subtract the value of a perpetuity (paying \$100/annum) beginning in 11 years from the value of a perpetuity (paying \$100/annum) beginning in one year.