KFUPM | Term 171 | Date: 10/12/2017
Mathematics & Statistics | AS 201 | Duration: 40 minutes

Quiz# 5

Name: ID #: Section:

Q1: A company has liabilities of 402.11 due at the end of each of the next three years. The company will invest 1000 today to fund these payouts. The only investments available are one-year and three-year zero-coupon bonds, and the yield curve is flat at a 10% annual effective rate. The company wishes to match the duration of its assets to the duration of its liabilities.

Determine how much the company should invest in each bond.

(A) 366 in the one-year bond and 634 in the three-year bond.
(B) 484 in the one-year bond and 516 in the three-year bond.
(C) 500 in the one-year bond and 500 in the three-year bond.
(D) 532 in the one-year bond and 468 in the three-year bond.
(E) 634 in the one-year bond and 366 in the three-year bond.

Q2: A 20-year bond priced to have an annual effective yield of 10% has a Macaulay duration of 11. Immediately after the bond is priced, the market yield rate increases by 0.25%. The bond's approximate percentage price change, using a first-order modified approximation, is *X*.
Calculate *X*.

(A) –2.22%
(B) –2.47%
(C) –2.50%
(D) –2.62%
(E) –2.75%

Q3: Krishna buys an n-year 1000 bond at par. The Macaulay duration is 7.959 years using an annual effective interest rate of 7.2%.
Calculate the estimated price of the bond, using the first-order Macaulay approximation, if the interest rate rises to 8.0%.

(A) 940.60
(B) 942.54
(C) 944.56
(D) 947.03
(E) 948.47