KFUPM	Term 181	Date: 9/12/2018
Mathematics & Statistics	AS 201	Duration: 35 minutes
	Quiz# 5	
Name:	ID #:	Section:

Q1: 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.

Q2: On January 1, a fund is worth 100,000. On June 1, the value has increased to 120,000 and then 30,000 of new principal is deposited. On October 1, the value has declined to 130,000 and then 50,000 is withdrawn. On January 1 of the following year, the fund is again worth 100,000.
Calculate the dollar-weighted rate of return using the simple interest approximation.

Q3: You are given the following information about an investment account:
(i) The value on January 1 is 10.
(ii) The value on July 1, prior to a deposit being made, is 12.
(iii) On July 1, a deposit of X is made.
(iv) The value on December 31 is X.

Over the year, the time-weighted return is 0%, and the dollar-weighted (money-weighted) return is Y.
Calculate Y.

Q4: Sam buys an eight-year, 5000 par bond with an annual coupon rate of 5%, paid annually. The bond sells for 5000. Let d_1 be the Macaulay duration just before the first coupon is paid. Let d_2 be the Macaulay duration just after the first coupon is paid.
Calculate d_1 / d_2 ?

Q5: 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.