

MAP 4170

Name: _____

Test 3

Date: November 13, 2014

Show sufficient work and clearly mark your answers. Each problem is worth 10 points.

1. A special 10-year bond, redeemable at 1000, has increasing annual coupons whereby each coupon is 3% more than its preceding coupon. The initial coupon is 100. Determine the price of the bond to yield 5% annual effective.

(A) 1480

(B) 1490

(C) 1500

(D) 1510

(E) 1520

2. A 20-year 1000 face value callable bond with 6% semiannual coupons is redeemable at the end of any year starting with year 16. The redemption value is 1200 for all years except year 18, in which the redemption value is 1150. Determine the maximum price an investor should pay in order to guarantee a semiannual effective yield of at least 4%.

(A) 833

(B) 843

(C) 847

(D) 868

(E) 878

3. You are given the following information on Bonds A and B:

	Bond A	Bond B
Term	n years	$2n$ years
Annual coupon amount	K	K
Annual effective yield	i	i
Redemption Value	C	(See below)
Price	10000	P

Bond B is such that C will be redeemed at the end of year n , and another C will be redeemed at the end of year $2n$. Given $(1 + i)^n = 2.2$, determine the price P of Bond B.

- (A) Less than 10000
- (B) Greater than or equal to 10000, but less than 12000
- (C) Greater than or equal to 12000, but less than 14000
- (D) Greater than or equal to 14000, but less than 16000
- (E) Greater than or equal to 16000
4. A 30-year loan is repaid with level annual payments of 5500. The balance on the loan immediately before the 29th payment is 10500. Determine the amount of principal repaid with the 15th payment.
- (A) 1200
- (B) 1280
- (C) 1315
- (D) 1400
- (E) 1435

5. A lender charges an annual effective interest rate of 6% on a 100000 loan. Payments are annual. The first 15 payments are 150% of the interest due at the time of the payment. The next 15 payments are level payments of 6000. Immediately after the 30th payment, the borrower still owes X . Determine X .
- (A) 9810
- (B) 10245
- (C) 10970
- (D) 11565
- (E) 12105
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6. Billy buys a 1000 face value 20-year bond, redeemable at par, with 8% semiannual coupons at a price to yield 6% compounded semiannually. Each time Billy receives a coupon, he invests the coupon in an account that earns a nominal interest rate of i , compounded semiannually. Immediately after receiving the 7th coupon, Billy sells the bond to Bob at a price to yield Bob 8% compounded semiannually. Billy's annual effective yield during the time that he owns the bond is 1.6%. Determine i .
- (A) 2.5%
- (B) 3.0%
- (C) 5.0%
- (D) 6.0%
- (E) 10.0%

7. Smith lends Brown 10000. Brown repays the loan with 10 annual payments of 1000 plus interest on the unpaid balance at 8% annual effective. Each time Smith receives a payment, she invests the payment in an account that earns 6% annual effective. Determine Smith's annual yield on the loan.

(A) 4.5%

(B) 5.3%

(C) 6.1%

(D) 6.9%

(E) 7.7%

8. A loan of L is to be repaid using the sinking fund method with annual payments for 10 years. The lender charges 10% annual effective and deposits into the sinking fund earn 12% annual effective. The total annual payment is 345 less than the payments would be if the borrower amortized the loan with level annual payments for 10 years at 10% annual effective. Determine L .

(A) Less than 61000

(B) Greater than or equal to 61000, but less than 63000

(C) Greater than or equal to 63000, but less than 65000

(D) Greater than or equal to 65000, but less than 67000

(E) Greater than or equal to 67000

9. An n -year loan of L is amortized with level monthly payments of 1640. The amount of interest paid in the 4th month is 1240 and the amount of interest paid in the 17th month is 1140. Determine L .

(A) 72415

(B) 72560

(C) 72780

(D) 72965

(E) 73155

10. An n -year bond with annual coupons of 50 is bought to yield 4% annual effective. The accumulation of discount in the 8th year is 8. Determine the price of the bond.

(A) 1100

(B) 1105

(C) 1250

(D) 1395

(E) 1400