King Fahd University Of Petroleum & Minerals
Department Of Mathematics
AS201 : Financial Mathematics (231)

ID:_____

Name:_____

MCQ	A	B	C	D	E
Q1	O	O	O	O	O
Q2	O	O	O	O	O
Q3	O	O	O	O	O
Q4	O	O	O	O	O
Q5	O	O	O	O	O
Q6	O	O	O	O	O
Q7	O	O	O	O	O
Q8	O	O	O	O	O
Q9	O	O	O	O	O
Q10	O	O	O	O	O
Q11	O	O	O	O	O
Q12	O	O	O	O	O

1. A loan is to be repaid with level annual payments based on annual effective interest rate of 8%. The 7th payment consists of on interest 807.7 of interest and 192.3 of principal.

Calculate the amount of interest paid in the 17th payment.

   a) 415

   b) 444

   c) 556

   d) 585

   e) 612

2. Seth borrows X for five years at an annual effective interest rate of 2%, to be repaid with equal payments at the end of each year. The outstanding loan balance at the end of the third year is 972.

Calculate the principal repaid in the first payment.

   a) 444

   b) 454

   c) 464

   d) 474

   e) 484

3. You have decided to invest in Bond X, an *n*-year bond with semi-annual coupons and the following characteristics:

(i) Par value is 1000.

(ii) The ratio of the semi-annual coupon rate to the desired semi-annual yield rate is

$$\frac{r}{i} = 1.03125.$$

(iii) The present value of the redemption value is 375.40.

Given $(1+i)^{-n} = 0.5889$

Calculate the price of bond X.

    a) 1019

    b) 1029

    c) 1050

    d) 1055

    e) 1072

4. A loan is amortized over five years with monthly payments at an annual nominal interest rate of

9% compounded monthly. The first payment is 1000 and is to be paid one month from

the date of the loan. Each succeeding monthly payment will be 2% lower than the prior

payment.

Calculate the outstanding loan balance immediately after the 35th payment is made.

    a) 6750

    b) 6890

    c) 8109

    d) 8528

    e) 8954

5. A 10,000 par value 10-year bond with 8% annual coupons is bought at a premium to yield an annual effective rate of 6%.

Calculate the interest portion of the 6th coupon.

    a) 632

    b) 642

    c) 651

    d) 660

    e) 667

6. Susan can buy a zero coupon bond that will pay 1000 at the end of 15 years and is currently selling for 624. Instead, she purchases a 6% bond with coupons payable semi-annually that wil pay 1000 at the end of 10 years. If she pays X she wil earn the same annual effective interest rate as the zero coupon bond. Calculate X.

    a) 1164

    b) 1238

    c) 1270

    d) 1167

    e) 1276

7. Mary purchased a 10-year par value bond with semiannual coupons at a nominal annual rate of 6% convertible semiannually at a price of 1021.50. The bond can be called at par value 1100 on any coupon date starting at the end of year 5.

What is the minimum yield that Mary could receive, expressed as a nominal annual rate of interest convertible semiannually?

   a) 4.8%

   b) 4.9%

   c) 5.0%

   d) 8.1%

   e) 7.0%

8. A 1000 par value bond with coupons at 11% payable semiannually was called for 1100 prior to maturity. The bond was bought for 923 immediately after a coupon payment and was held to call. The nominal yield rate convertible semiannually was 12%. **Calculate the number of years the bond was held.**

   a) 20

   b) 28

   c) 29

   d) 39

   e) 58

9. Smith buys 1000 shares of stock at 5.00 per share and pays a commission of 2%. Six months later he receives a cash dividend of 0.20 per share, which he immediately reinvests commission-free in shares at a price of 4.00 per share. Six months after that he buys another 500 shares at a price of 4.50 per share, and pays a commission of 2%. Six months after that he receives another cash dividend of 0.25 per share and sells his existing shares at 5.00 per share, again paying a 2% commission.

Find Smith's internal rate of return for the entire transaction in the form $i^{(2)}$.

   a) 6.5%

   b) 4. 4%

   c) 2.2%

   d) 5%

   e) 2.5%

10. Mike receives cash flows of 100 today, 200 in one year, and 100 in two years. The present value of these cash flows is 364.46 at an annual effective rate of interest i.

Calculate i.

   a) 10%

   b) 12%

   c) 1%

   d) 13%

   e) 18%

11. You are given the following information about an investment account:

Date	Value Immediately Before Deposit	Deposit
January 1	10	
July 1	14	X
December 31	X	

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

a) -15%

b) -25%

c) -36%

d) 25%

e) 36%

12. At the beginning of the year, an investment fund was established with an initial deposit of 1000. A new deposit of 1000 was made at the end of 4 months. Withdrawals of 200 and 500 were made at the end of 6 months and 8 months, respectively. The amount in the fund at the end of the year is 1560.

Calculate the dollar-weighted (money-weighted) yield rate earned by the fund during the year.

a) 20.00%

b) 22.61%

c) 26.00%

d) 18.57%

e) 28.89%