

EXAM FM QUESTIONS OF THE WEEK

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Week of March 12/07

Face amount of bond: \$1,000

Purchase date: 1/1/92

Maturity value: \$1,000

Coupon rate: 8% per year, compounded annually

Coupon date: 12/31

Yield to purchaser: 10% per year, compounded annually

Amortized value of bond at 1/1/97: Z

Amortized value of bond at 1/1/98: $Z + 10.25$

In what range is the purchase price of the bond?

- A) Less than \$860 B) At least \$860 but less than \$870 C) At least \$870 but less than \$880
D) At least \$880 but less than \$890 E) At least \$890

The solution can be found below.

Week of March 12/07 - Solution

Using the relationship $BV_{t-1} \cdot (1 + j) - Fr = BV_t$, we get

$Z \cdot (1.10) - 1000(.08) = Z + 10.25$. From this equation, we get $Z = 902.50$.

$Z = 902.50$ is the amortized value on 1/1/97, the day after the 5-th coupon (the first coupon was paid on 12/31/92, and the 5-th coupon is paid on 12/31/96). Amortized value of a bond is identical algebraically to amortized value of a loan. $Z = 902.50$ is OB_5 where the original purchase price of the bond P is the loan amount, the yield to maturity is the loan rate (10%) and the loan payments are the coupons. Therefore, using the retrospective form for outstanding balance, we get $902.50 = P(1.1)^5 - 80s_{\overline{5}|.1} = 1.6105P - 488.41$. The purchase price of the bond is $P = \frac{902.50 + 488.41}{1.6105} = 863.50$. Answer: B