Learning Module 6: Fixed Income Bond Valuations: Prices and Yields

Q.68 A 10-year bond was issued at par with an 8% coupon rate per $1000 par value, paid yearly. If the required rate of return is now 9.5%, the present value of this bond 5 years later is *closest to*;

A. $867.81

B. $905.82

C. $942.40

The correct answer is **C.**

Using the financial calculator:
N=5; I=9.5%; PMT=80; FV=1,000;
CPT -> PV = -942.40

The answer choices given on this particular question can help us solve it without any calculations. The bond was issued at par (1,000)
The current required rate of return (9.5%) is higher than the coupon rate of 8%. This implies that the bond is trading at a discount (a value less than 1,000), and that value is answer choice A.

A is incorrect. It assumes semi-annual compounding.

B is incorrect. It assumes a 10-year period, but we need the price of the bond after 5 years.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.854 James Kirsten purchased Bond A, which has the following characteristics:

- Coupon payment per period: 7%
- No. of periods to maturity: 4 years
- Market discount rate per period: 10.5%

The fair price of this bond (100 in par value) is *closest to*:

A. 89.02

B. 90.08

C. 111.86

The correct answer is **A.**

$$\text{Fair price} = [\frac{7}{1.105^1} + \frac{7}{1.105^2} + \frac{7}{1.105^3} + \frac{107}{1.105^4}] = 89.02$$

We can also use the financial calculator to solve this problem. $\text{N} = 4; \text{PMT} = 7; \text{I/Y} = 10.5; \text{FV} = 100; \text{CPT} => \text{PV} = 89.02$

B is incorrect. Assumes semi-annual compounding:

$\text{N} = 8; \text{PMT} = 3.5; \text{I} = 5.25; \text{FV} = 100; \text{CPT} => \text{PV} = 90.08$

C is incorrect. Alternates the yield maturity and coupon rate:

$\text{N} = 8; \text{PMT} = 10.5; \text{I/Y} = 7; \text{FV} = 100; \text{CPT} => \text{PV} = 111.86$

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.855 If the coupon rate of a bond is 5% and the market discount rate is 3%, then the bond is priced at:

A. At par value.

B. A premium above par value.

C. A discount below par value.

The correct answer is **B.**

When the coupon rate is greater than the market discount rate, the bond is priced at a premium above par value.

A is incorrect. When the coupon rate is equal to the market discount rate, the bond is priced at par.

C is incorrect. When the coupon rate is less than the market discount rate, the bond is priced at a discount below par level.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.857 An investor who owns a bond with an 11% coupon rate that pays interests semi-annually and matures in 4 years is considering its sale if the required rate of return is 15%. The price of the bond per 100 of par value is *closest to*:

A. 88.29

B. 88.58.

C. 112.67.

The correct answer is **A.**

Using the financial calculator: $N = 8; I/Y = 7.5; PMT = 5.5; FV = 100; CPT -> PV = -88.29$

B is incorrect. It assumes annual compounding, yet the question requires semi-annual compounding:
$N = 4; I/Y = 15; PMT = 11; FV = 100; CPT -> PV = -88.58$

C is incorrect. It alternates coupon rate with the required rate of return:
$N = 8; I/Y = 5.5; PMT = 7.5; FV = 100; CPT -> PV = 112.67$

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.858 Suzanne Jennings purchased Bond A with a coupon payment per period of 4% for 4 years at a price of $106. The bond is *most likely* trading at:

A. Par value.

B. A premium.

C. A discount.

The correct answer is **B.**

When the coupon rate is greater than the market discount rate, the bond is priced at a premium above par value.
The market discount rate is calculated as:
N = 4; PV = -106; PMT = 4; FV = 100;
CPT -> I/Y = 2.41% < 4% = 2.24%

A is incorrect. A par value bond refers to when the coupon rate is equal to the market discount rate.

C is incorrect. When the bond's coupon rate is less than the market discount rate, the bond is said to be at a discount below par value.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.860 A 3.125% government bond is priced for settlement on April 12, 2016. The bond makes quarterly coupon payments on June 30th, September 30th, December 31st, and March 31st. The bond's accrued interests per 100 of par value at settlement is *closest to*:

A. 0.026

B. 0.103.

C. 0.781

The correct answer is **B.**

Government bonds have 365 days, therefore:

$$\frac{365}{4} = 91.25 \text{ days}$$

$$\text{Accrued interest} = (\frac{12}{91.25 \text{ days}}) \times (\frac{3.125}{4}) = 0.1027$$

Note: Another way to do the calculation is:

$$\text{AI} = \frac{\text{t}}{\text{T}} \times \text{PMT}$$

, where $\frac{t}{T}$is the fraction of the coupon period that has passed since the last payment, and PMT the coupon payment for the period.Thus,

$$\text{Accrued interest} = (\frac{12}{365}) \times (0.03125) = 0.1027$$

A is incorrect. It assumes the calculation as follows;

$$\frac{12}{365} \times \frac{3.125}{4} = 0.026$$

C is incorrect. It assumes the 3.125% government bond divided by the quarterly payments.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2143 Assume that a city issues a $5 million bond to build a new arena. The bond pays 8% semiannual interest and will mature in 10 years. If current interest rates are 9%, then the present value of the bond and the estimated value of the bond seven years from today are *closest to*:

A. Present value: $4,674,802
Value in seven years: $4,931,276.

B. Present value: $4,674,802
Value in seven years: $4,871,053

C. Present value: $5,339,758
Value in seven years: $4,871,053.

The correct answer is **B.**

Present value using the financial calculator:

$$\text{FV} = 5,000,000; \text{N} = 20; \text{PMT} = 0.04 \times 5,000,000 = 200,000; \text{I/Y} = 4.5; \text{CPT} \Rightarrow \text{PV} = -4,674,80$$

Value in seven years using the financial calculator:

$$\text{FV} = 5,000,000; \text{N} = 6; \text{PMT} = 0.04 \times 5,000,000 = 200,000; \text{I/Y} = 4.5; \text{CPT} \Rightarrow \text{PV} = -4,871,053$$

A is incorrect. It suggests a value in seven years that is higher than the calculated value based on the given interest rates and time periods. This does not align with the principles of bond valuation and the effects of interest rates on bond prices.

C is incorrect. It suggests a present value that is higher than the face value of the bond, which is not possible given that the market interest rate is higher than the coupon rate, indicating the bond should sell at a discount.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2481 A bond's price and returns are *most likely* determined by

A. The interest rates in the bond's currency.

B. The reference rate to which the bond is indexed.

C. The interest rates of the home currency in the market where the bond is issued.

The correct answer is **A.**

A bond's price and returns are determined by the interest rates in the bond's currency. The price of a bond goes up and down depending on the value of the income provided by its coupon payments relative to broader interest rates. If prevailing interest rates increase above the bond’s coupon rate, the bond becomes less attractive. In this situation, the bond price drops to compensate for the less attractive yield. Conversely, if the prevailing interest rate drops below the bond’s coupon rate, the price of the bond goes up as it becomes more attractive.

B is incorrect. While it is true that for some specific types of bonds, such as floating-rate bonds, the coupon payments may be directly tied to a reference rate, the overall price and returns of a bond are still influenced by the broader interest rates in the bond's currency.

C is incorrect. The bond's cash flows are valued in its currency, and changes in the interest rates of that currency directly affect the discount rate used to calculate the present value of those cash flows.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond’s price, coupon rate, maturity, and yield-to-maturity.

Q.2497 Consider a 5-period zero-coupon bond with a par value of $1,000 and a discount rate of 3% per period. The value of this bond is **closest to**:

A. $744.10

B. $862.61.

C. $1,159.27.

The correct answer is **B.**

With a discount rate of 3% per period, a 5-period zero-coupon bond with a par value of $1,000 has a value of:

$$\text{PV} = \frac{1,000}{1.03^5} = 862.61$$

Using the financial calculator:
N=5; I/Y=3; PMT=0 (since it's a zero-coupon bond); FV=1000; CPT PV = -862.61

A is incorrect. It assumes the semi-annual compounding:

$$\text{PV} = \frac{1,000}{1.015^{10}} = \$744.10$$

C is incorrect. It calculates the accumulation value of the par value;

$$\text{PV} = \$1,000 \times 1.03^5 = \$1,159.27$$

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2498 The present value of a newly issued 10-year, $1,000 par value security, that will pay $60 every six months with an annual YTM of 8%, is *closest to*:

A. $803.64

B. $865.80

C. $1,271.81.

The correct answer is **C.**

Using the financial calculator:
$\text{N} = 20; \text{PMT} = 60; \text{FV} = 1,000; \text{I/Y} = 4; \text{CPT} => \text{PV} = -1,271.81$

A is incorrect. It assumes the annual yield to maturity ;

$\text{N} = 20; \text{PMT} = 60; \text{FV} = 1,000; \text{I/Y} = 8; \text{CPT} => \text{PV} = -803.64$

B is incorrect. It assumes the calculation as follows;

$\text{N} = 10; \text{PMT} = 60; \text{FV} = 1,000; \text{I/Y} = 8; \text{CPT} => \text{PV} = -865.80$

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2499 Is the following statement correct?
When bond yields decrease, the present value of a bond's payments, its market value, increases.

A. The statement is correct.

B. The statement is incorrect. When bond yields decrease, the present value of a bond's payments, its market value, decreases.

C. The statement is incorrect. When bond yields decrease, the present value of a bond's payments, its market value, remains unaffected.

The correct answer is **A.**

The given statement is correct. Bond prices are inversely correlated with bond yields. When bond yields decrease, the present value of a bond's payments, its market value, increases. Similarly, when bond yields increase, the present value of a bond’s payments decreases.

Let's assume that a bond is currently trading at $98. Assume that the current market interest rate is 5%, and determine the new prices when within one year, the bond yields (1) go up and (2) go down by 100 basis points.

Case 1: Yield goes up. PV of the bond $= \frac{98}{(1+(0.05+0.01)^1} = 92.45$

Case 2: Yield goes down. PV of the bond $= \frac{98}{(1+(0.05-0.01)^1} = 94.23$

As seen above, the present value of the bond is lower when the yield goes up, and higher when the yield goes down. Bond yields are inversely correlated with interest rates.

B and C is incorrect. They contradict option A given the explanation above.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond’s price, coupon rate, maturity, and yield-to-maturity.

Q.2500 Is the following statement correct? If not, why?
''A 2% decrease in yield-to-maturity increases the bond's value by less than 2% as increase in yield decreases the bond's value.''

A. The statement is correct.

B. The statement is incorrect because a 2% decrease in yield-to-maturity increases the bond's value by more than a 2% increase in yield decreases the bond's value.

C. The statement is incorrect because a 2% decrease in yield-to-maturity increases the bond's value equally as a 2% increase in yield decreases the bond's value.

The correct answer is **B.**

The convexity effect states that percentage changes in bond prices are not symmetric. The percentage change seen when the market discount rate goes down is greater than when the market discount rate goes up.

A is incorrect. A 2% decrease in yield-to-maturity increases the bond's value by more than a 2% increase in yield decreases bond's value. It illustrates that the bond's price-yield relationship is convex.

C is incorrect. The relationship between yield-to-maturity and market discount rate is not linear.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2502 Which of the following statements is/are correct?
Statement I. If a bond's coupon rate is greater than its YTM, its price will be at a premium to par value.

Statement II. The percentage decrease in value when the YTM increases by a given amount is smaller than the increase in value when the YTM decreases by the same amount.

A. Both statements are correct.

B. Both statements are incorrect.

C. Only one statement is correct.

The correct answer is **A.**

Both statements are correct. If a bond's coupon rate is greater than its YTM, its price will be at a premium to par value. If a bond's coupon rate is less than its YTM, its price will be at a discount to par value. The percentage decrease in value when the YTM increases by a given amount is smaller than the increase in value when the YTM decreases by the same amount (the price-yield relationship is convex).

B is incorrect. For the same reason as option A; it inaccurately suggests that both statements are incorrect, overlooking the established principles of bond valuation and the convex price-yield relationship.

C is incorrect. It suggests that only one statement is correct, whereas both statements accurately reflect fundamental concepts in bond pricing and the behavior of bond prices in response to changes in YTM.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2503 Taking into consideration all factors held constant, the price of a bond with a lower coupon rate is *most likely*:

A. More sensitive to a change in yield than the price of a bond with a higher coupon rate.

B. Less sensitive to a change in yield than is the price of a bond with a higher coupon rate.

C. Equally sensitive to a change in yield than is the price of a bond with a higher coupon rate.

The correct answer is **A.**

Other things equal, the price of a bond with a lower coupon rate is more sensitive to a change in yield than is the price of a bond with a higher coupon rate.

B is incorrect. When the prevailing market rate of interest is higher than the coupon rate, e.g., a 7% interest rate and a bond coupon rate of just 5%, the price of the bond tends to drop on the open market because investors don't want to purchase a bond at face value and receive a 5% yield when they could source other investments that yield 7%.

C is incorrect. If a coupon is higher than the prevailing interest rate, the bond's price rises; if the coupon is lower, the bond's price falls.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2504 The *most appropriate* meaning of "Constant-yield price trajectory" is;

A. A constant YTM with as time passes.

B. A constant value of the bond as time passes.

C. A convergence of the bond's value to par at maturity with a constant YTM.

The correct answer is **C.**

The convergence of bond value to par at maturity is known as the constant-yield price trajectory because it shows how the bond's price would change as time passes if its yield-to-maturity remained constant.

A is incorrect. A constant YTM exists where Macaulay and modified durations depend on the day-count basis used to obtain the yield-to-maturity.

B is incorrect. The value of a bond can never be constant.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2508 The flat price of a bond can be calculated as:

A. Dirty price - Clean price.

B. Accrued interest - Clean price.

C. Invoice price - Accrued interest.

The correct answer is **C.**

Recall that:

$$\text{Flat price} = \text{Full price} - \text{Accrued interest}$$

Another name for 'flat price' is 'quoted price' or 'clean price" moreover, the other name for 'full price' is the 'invoice price' or 'dirty price.'

A is incorrect. Another name for 'full price' is the 'invoice price' or 'dirty price.'

B is incorrect. The clean price of the bond is the offered price of the bond, excluding the accrued interest.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2509 Robert Phelps is estimating the value of a non-traded 4% annual-pay, BB-rated bond that has five years remaining until maturity. He has obtained the following yields-to-maturities (YTM) on similar corporate bonds:
BB-rated, 4-year annual-pay, 5% coupon bond: YTM = 4.738%
BB-rated, 6-year annual-pay, 4% coupon bond: YTM = 5.628%
BB-rated, 6-year annual-pay, 6% coupon bond: YTM = 5.635%.

Using the linear interpolation method, the discount rate that should be used to value the non-traded bond is *closest to*:

A. 4.738%

B. 5.185%

C. 5.632%

The correct answer is **B.**

We are interested in the YTM of a 5-year annual-pay, 4% coupon bond: We have the YTMs of comparable 4-year and 6-year bonds. To obtain the discount rate used to price that bond, we will have to interpolate the YTMs of these (4-year and 6-year) bonds. How do we go about that?

$$\text{Discount rate for the non-traded bond} = \text{YTM of lower term bond} + \frac{(\text{time to maturity of non-trad}}{(\text{time to maturity of higher te}}$$

Thus,

$$\text{Average YTM of higher term bonds} = \frac{(5.628\% + 5.635\%)}{2} = 5.632\%$$

$$\text{Average YTM of lower term bonds} = 4.738\% \text{ (there's a single 4-year bond)}$$

Discount rate for the 5-year bond, therefore

$$= 4.738\% + [\frac{(5-4)}{(6-4)}] \times [5.632\% - 4.738\%] = 5.185\%$$

A is incorrect. It indicates the average YTM of lower term bonds.

C is incorrect. It indicates the average of YTM of higher term bonds.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.2514 The option-adjusted yield will *most likely* be:

A. Lower than the yield-to-maturity for a callable bond because callable bonds have lower yields to compensate bondholders for the issuer's call option.

B. Higher than the yield-to-maturity for a callable bond because callable bonds have higher yields to compensate bondholders for the issuer's call option.

C. Higher than the yield-to-maturity for a callable bond because callable bonds have lower yields to compensate bondholders for the issuer's call option.

The correct answer is **B.**

The option-adjusted yield (OAS) is a measure of the yield of a bond that accounts for the value of any embedded options, such as a call option, which allows the issuer to redeem the bond before its maturity date. The OAS takes into account the probability that the bond will be called and adjusts the yield accordingly.

A callable bond has an embedded call option that gives the issuer the right to redeem the bond before its maturity date. To compensate bondholders for this option, callable bonds typically offer a higher yield-to-maturity (YTM) compared to non-callable bonds.

A is incorrect. It suggests that the option-adjusted yield would be lower than the yield-to-maturity (YTM) for a callable bond due to lower yields offered to compensate bondholders for the call option. This interpretation misunderstands the relationship between callable bonds and their yields.

C is incorrect. It confuses the rationale behind the yield differences. The key misunderstanding here is the role of the option-adjusted yield, which is to adjust the bond's yield to reflect the value and risk of embedded options, not to simply increase the yield to compensate for lower yields offered by callable bonds.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (b): Identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.3748 A 180-day bankers acceptance (BA) is quoted at a discount rate of 3.56% for a 360-day year. The bond equivalent yield is *closest* to:

A. 3.62%.

B. 3.66%.

C. 3.68%.

The correct answer is **C.**

The price (present value) of a BA is calculated using the formula:

$$PV = FV \times (1 - \frac{Days}{Year} \times DR)$$

Where,

PV = principal amount (the price of the money market)

FV = redemption value of the money market instrument at maturity (including the interest)

Days = number the days between the settlement and maturity periods

Year = number of days in a year

DR = discount rate (usually stated as an annual percentage rate)

So in this case,

$$PV = 100 \times (1 - \frac{180}{360} \times 0.0356) = 98.22$$

The bond equivalent rate, also called the add-on rate (AOR), is calculated as:

$$\begin{aligned} AOR &= (\frac{Year}{Days}) \times (\frac{FV\text{-}PV}{PV}) \\ &= (\frac{365}{180}) \times (\frac{100 - 98.22}{98.22}) = 0.03675 = 3.675\% \end{aligned}$$

A is incorrect. A yield of 3.62% does not accurately reflect the conversion of the discount rate to a bond equivalent yield considering the effects of compounding over a 360-day year.

B is incorrect. A yield of 3.66% is closer to the correct answer but still does not accurately capture the effect of the discount rate being annualized on a 360-day basis and then adjusted for a 180-day period.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (a): Calculate a bond's price given a yield-to-maturity on or between coupon dates.

Q.3749 A 91-day US T-bill has a face value of $100 million, and it is quoted at a 3% discount rate for a 360-day year. The price of the T-bill is *closest* to:

A. $96.52 million.

B. $97.95 million.

C. $99.24 million.

The correct answer is **C.**

The price of the T-bill is given by:

$$\text{PV} = \text{FV} \times \left(1 - \frac{\text{Days}}{\text{Year}} \times \text{DR}\right)$$

Where

PV = principal amount (the price of the money mar)

FV = redemption value of the money market instrument at maturity (including the interest)

Days = number the days between the settlement and maturity periods

Year = number of days in a year

DR = discount rate (usually stated as an annual percentage rate)

So that in this case,

$$\text{PV} = 100 \times \left(1 - \frac{91}{360} \times 0.03\right) = \$99.24 \text{ million}$$

A is incorrect. It suggests a price of $96.52 million, which would imply a much higher discount rate or a longer time to maturity than what is given.

B is incorrect. It indicates a price of $97.95 million, which, while closer to the correct answer than option A, still does not correctly apply the given discount rate and time to maturity.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (a): Calculate a bond's price given a yield-to-maturity on or between coupon dates.

Q.3750 A 91-day US T-bill is priced at $295 million with a face value of $300 million for a 360-day year. The quoted discount rate of the T-bill is *closest* to:

A. 6.5%.

B. 6.6%

C. 6.7%.

The correct answer is **B.**

$$\text{DR} = (\frac{\text{Year}}{\text{Days}}) \times (\frac{\text{FV-PV}}{\text{FV}})$$

Where

PV = principal amount (the price of the money mar)

FV = redemption value of the money market instrument at maturity (including the interest)

Days = number the days between the settlement and maturity periods

Year = number of days in a year

DR = discount rate (usually stated as an annual percentage rate)

So that in this case,

$$\text{DR} = (\frac{360}{91}) \times (\frac{300 - 295}{300}) = \ 0.06593 \approx 6.6\%$$

A is incorrect. A discount rate of 6.5% does not accurately reflect the calculation based on the given values of face value, purchase price, and the specific days until maturity.

C is incorrect. A discount rate of 6.7% overshoots the correct calculation based on the provided values.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (a): Calculate a bond's price given a yield-to-maturity on or between coupon dates.

Q.3751 A pension fund pays a banker's acceptance (BA) with a quoted add-on rate of 5% for a 365-day year. The BA has an initial principal of CAD 100 million and a redemption value of CAD 103 million. The number the days between the settlement and the maturity period is *closest* to:

A. 150 days.

B. 219 days.

C. 240 days.

The correct answer is **B.**

The pricing formula for the money market instruments quoted on add-on rates is given by:

$$\text{PV} = \frac{\text{FV}}{(1 + \frac{\text{Days}}{\text{Year}} \times \text{AOR})}$$

Where

PV = principal amount (the price of the money mar)

FV = redemption value of the money market instrument at maturity (including the interest)

Days = number the days between the settlement and maturity periods

Year = number of days in a year

AOR = add-on rate (usually stated as an annual percentage rate)

So in our case,

$$100 = \frac{103}{(1 + \frac{\text{Days}}{365} \times 0.05)}$$

$$\Rightarrow \text{Days} = [\frac{103}{100} - 1] \times \frac{365}{0.05} = 219$$

A is incorrect. Accepting the sell order without informing the client about the recent change in the firm's recommendation overlooks the importance of transparency and fair dealing in professional conduct.

C is incorrect. It is contrary to the firm's recommendation undermines the principle of acting in the client's best interest. Investment professionals are expected to provide objective advice and support to their clients, respecting their right to make their own investment decisions.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (a): Calculate a bond's price given a yield-to-maturity on or between coupon dates.

Q.3752 An investor invested in a 90-day commercial paper quoted at a discount rate of 5% for a

360-day year with a redemption value of $200. The bond equivalent yield is *closest* to:

A. 4.15%.

B. 5.06%.

C. 5.13%.

The correct answer is **C.**

The price (present value) of a BA is calculated using the formula:

$$PV = FV \times (1 - \frac{Days}{Year} \times DR)$$

Where,

PV = principal amount (the price of the money market)

FV = redemption value of the money market instrument at maturity (including the interest)

Days = number the days between the settlement and maturity periods

Year = number of days in a year

DR = discount rate (usually stated as an annual percentage rate)

So in this case,

$$PV = 200 \times (1 - \frac{90}{360} \times 0.05) = 197.50$$

The bond equivalent rate, also called the add-on rate (AOR), is calculated as:

$$AOR = (\frac{Year}{Days}) \times (\frac{FV\text{-}PV}{PV})$$
$$= (\frac{365}{90}) \times (\frac{200 - 197.50}{197.50}) = 0.0513 \approx 5.13\%$$

A is incorrect. It equates the indicative discount rate to the bond equivalent yield.

B is incorrect. It assumes the indicative 360 day year instead of the correct 365 day year for calculation the bond equivalent yield as follows;

$$Year = FV\text{-}PV = 200 - 197.50$$

$$\text{AOR} = \frac{\text{Year}}{\text{Days}} \times \frac{\text{FV-PV}}{\text{PV}} = \frac{360}{90} \times \frac{200 - 197.50}{197.50} = 5.063\%$$

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (a): Calculate a bond's price given a yield-to-maturity on or between coupon dates.

Q.4418 Which of the following *most likely* defines a zero-coupon bond? A bond that pays:

A. Fixed periodic interest payments.

B. Variable interest determined by a market reference rate.

C. Interest as part of a single payment with the principal at maturity.

The correct answer is **C.**

Zero-coupon bonds do not make periodic interest payments, which are commonly known as coupon payments. Instead, they are mostly issued at a discount to par value and pay no interest until maturity. At maturity, the bondholder receives a single payment that includes both the principal and the accumulated interest. The difference between the purchase price of the bond and its par value at maturity represents the bondholder's earnings, which is why zero-coupon bonds are considered a type of deep-discount bond.

A is incorrect. This answer describes a fixed-coupon bond. A fixed-coupon bond pays a set amount of interest to investors at regular intervals, typically semi-annually or annually, until the bond's maturity date. The interest rate is determined when the bond is issued and remains the same throughout the life of the bond.

B is incorrect. This answer describes a floating-rate note (FRN), which is a bond that has a variable interest rate. The coupon rate of a floating-rate note is typically reset periodically, based on a reference interest rate or index such as LIBOR or the federal funds rate.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (a): Calculate a bond's price given a yield-to-maturity on or between coupon dates.

Q.4420 Which of the following *best* describes a bond's yield-to-maturity (YTM)?

A. The bond's annual coupon divided by its price.

B. The yield obtained by plotting the bond's maturity against its coupon rate.

C. The internal rate of return calculated using the bond's price and its expected cash flows to maturity.

The correct answer is **C.**

Yield-to-maturity (YTM) is the internal rate of return (IRR) for a bond, which includes all expected cash flows from the present until the bond's maturity date, discounted at the same rate that equates the present value of these cash flows to the bond's current market price. YTM is a comprehensive return measure because it includes not only the bond's coupon payments but also the gain or loss that occurs when the bond is redeemed at maturity, which may be at a premium or discount to its face value.

A is incorrect. The description given in choice A refers to the current yield of a bond, which is calculated by dividing the annual coupon payments by the bond's current market price. Unlike YTM, the current yield does not take into account the capital gain or loss that the investor will realize if the bond is held to maturity, nor does it account for the time value of money.

B is incorrect. The yield obtained by plotting the bond's maturity against its coupon rate on a graph is related to the construction of a yield curve, which shows the relationship between yields and maturities for a set of similar bonds at a point in time. The yield curve does not provide a specific yield-to-maturity for an individual bond.

CFA Level I, Fixed Income, Learning Module 6: Fixed Income Bond Valuations: Prices and Yields. LOS (a): Calculate a bond’s price given a yield-to-maturity on or between coupon dates.
