Question #1 of 78

Suppose that the value of an option-free bond is equal to 100.16, the value of the corresponding callable bond is equal to 99.42, and the value of the corresponding putable bond is 101.72. What is the value of the call option?

A) 0.74.

B) 0.64.

C) 0.21.

Question #2 of 78

How do the risk-return characteristics of a newly issued convertible bond compare with the risk-return characteristics of ownership of the underlying common stock? The convertible bond has:

A) higher risk and higher return potential.

B) lower risk and higher return potential.

C) lower risk and lower return potential.

Question #3 of 78

The effective convexity of a bond is most likely to be negative if the bond is:

A) callable.

B) putable.

C) option-free.

Question #4 of 78

What is the market conversion price of a convertible security?

A) The price that an investor pays for the common stock if the convertible bond is purchased and then converted into the stock.

B) The price that an investor pays for the common stock in the market.

C) The value of the security if it is converted immediately.

Question #5 of 78

Joseph Dentice, CFA is evaluating three bonds. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable at any time at par and bond C is putable at any time at par. Yield curve is currently flat at 3%.

The bond with the lowest one-sided down-duration is *most likely* to be:

A) Bond B.

B) Bond A.

C) Bond C.

Question #6 of 78

MediSoft Inc. develops and distributes high-tech medical software used in hospitals and clinics across the United States and Canada. The firm's software provides an integrated solution to monitoring, analyzing, and managing output from a variety of diagnostic medical equipment including MRIs, CT scans, and EKG machines. MediSoft has grown rapidly since its inception ten years ago, averaging 25% growth in sales over the past decade. The company went public three years ago. Twelve months after its IPO, MediSoft made two semiannual coupon bond offerings, the first of which was a convertible bond. At the time of issuance, the convertible bond had a coupon rate of 7.25%, a par value of $1,000, a conversion price of $55.56, and ten years until maturity. Two years after issuance, the bond became callable at 102% of par value. Soon after the issuance of the convertible bond, the company issued another series of bonds, which were putable but contained no conversion or call features. The putable bonds were issued with a coupon of 8.0%, a par value of $1,000, and 15 years until maturity. One year after their issuance, the put feature of the putable bonds became active, allowing the bonds to be put at a price of 95% of par value, and increasing linearly over five yea rs to 100% of par value. MediSoft's convertible bonds are now trading in the market for a price of $947 with an estimated straight value of $917. The company's putable bonds are trading at a price of $1,052. Volatility in the price of MediSoft's common stock has been relatively high over the past few months. Currently, the stock is priced at $50 on the New York Stock Exchange and is expected to continue its annual dividend in the amount of $1.80 per share.

High-tech industry analysts for Brown & Associates, a money management firm specializing in fixed-income investments, have been closely following MediSoft ever since it went public three years ago. In general, portfolio managers at Brown & Associates do not participate in initial offerings of debt investments, preferring instead to see how the issue trades before considering taking a position in the issue. Because MediSoft's bonds have had ample time to trade in the marketplace, analysts and portfolio managers have taken an interest in the company's bonds. At a meeting to discuss the merits of MediSoft's bonds, the following comments were made by various portfolio managers and analysts at Brown & Associates:

> "Choosing to invest in MediSoft's convertible bond would benefit our portfolios in many ways, but the primary benefit is the limited downside risk associated with the bond. Because the straight value will provide a floor for the value of the convertible bond, downside risk is limited to the difference between the market price of the bond and the straight value."
>
> "Decreasing volatility in the price of MediSoft's common stock as well as increasing volatility in the level of interest rates are expected in the near future. The combined effects of these changes in volatility will be a decrease in the price of MediSoft's putable bonds and an increase in the price of the convertible bonds. Therefore, only the convertible bonds would be a suitable purchase."

Assuming the common stock of MediSoft underwent a one-for-two reverse split, how would the features of the company's bonds be adjusted? The:

A) conversion ratio of the convertible bond would be reduced by 50%.

B) market conversion price of the convertible bond would be reduced by half.

C) conversion value of the convertible bond would be reduced by half.

Question #7 of 78

Sharon Rogner, CFA is evaluating three bonds for inclusion in fixed income portfolio for one of her pension fund clients. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable in two years and bond C is putable in two years. Rogner computes the OAS of bond A to be 50bps using a binomial tree with an assumed interest rate volatility of 15%.

If Rogner revises her estimate of interest rate volatility to 20%, the computed OAS of Bond B would *most likely* be:

A) higher than 50bps.

B) lower than 50bps.

C) equal to 50bps.

Question #8 of 78

Joseph Dentice, CFA is evaluating three bonds. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable at any time at par and bond C is putable at any time at par. Yield curve is currently flat at 3%.

The bond *least likely* to have the highest one-sided down-duration is:

A) Bond B.

B) Bond C.

C) Bond A.

Question #9 of 78

For a callable bond, the value of an embedded option is the price of the option-free bond:

A) plus the risk-free rate.

B) plus the price of a callable bond of the same maturity, coupon and rating.

C) minus the price of a callable bond of the same maturity, coupon and rating.

Question #10 of 78

Suppose that the stock price of a common stock increases by 10%. Which of the following is *most* accurate for the price of the recently issued convertible bond? The value of the convertible bond will:

A) increase by less than 10%.

B) remain unchanged.

C) increase by 10%.

Question #11 of 78

Which of the following statements is *most* accurate concerning a convertible bond? A convertible bond's value depends:

A) on both interest rate changes and changes in the market price of the stock.

B) only on interest rate changes.

C) only on changes in the market price of the stock.

Question #12 of 78

Kylie Autumn, CFA, is a consultant with Tri-Vision Group. Robert Lullum, Senior Vice President at Langsford Investments, has asked for assistance with the evaluation of mortgage-backed and collateralized mortgage obligation (CMO) derivative securities for potential inclusion in several client portfolios. Langsford Investments mainly deals with equity investments and REITs, but the company recently purchased a small firm that invests mainly in fixed-income securities.

Lullum has done some research on the appropriate spread measures and option valuation models for fixed-income securities and wants to clarify some points. He wants to know if the following statements are correct:

Statement 1:	The proper spread measure for option-free corporate bonds is the nominal spread.
Statement 2:	Callable corporate bonds and mortgage-backed securities should be measured using the option-added spread.
Statement 3:	The Z-spread is appropriate for credit card ABS and auto loan ABS.

While Lullum meets with Autumn, Janet Van Ark, CFA charterholder and equity income portfolio manager for Langsford, is attempting to purchase bonds that may also provide her with equity exposure in the future. She has decided to analyze an 8% annual coupon bond with exactly 20 years to maturity. The bonds are convertible into 10 common shares for each $1,000 of par (face) value. The bond's market price is $920, and the common stock has a market price of $40. VanArk estimates that the stock will increase in value to $70 within the next two years. The stock's annual dividend is $0.40 per share, and the market yield on comparable non-convertible bonds is 9.5%.

Carl Leighton, a Langsford analyst and Level II CFA candidate, works with mortgage-backed and other asset-based securities. He provides Lullum with a list of credit enhancements for asset-backed securities, which includes letters of credit, excess servicing spread funds, overcollateralization, and bond insurance. Lullum then asks him for a status report of the firm's exposure to paythrough securities. He also asks Leighton to calculate the single-monthly mortality rate (SMM) and estimate the prepayment for the month for a seasoned mortgage pool with a $500,000 principal balance remaining. The scheduled monthly principal payment is $150 and the conditional prepayment rate (CPR) is 7%.

How many of the three statements on appropriate spread measures and valuation models are correct?

A) None of the three statements are correct.

B) Only one statement is correct.

C) Only two statements are correct.

Question #13 of 78

Which of the following scenarios will lead to a convertible bond underperforming the underlying stock? The:

A) stock price rises.

B) stock price falls.

C) stock price is stable.

Question #14 of 78

Kylie Autumn, CFA, is a consultant with Tri-Vision Group. Robert Lullum, Senior Vice President at Langsford Investments, has asked for assistance with the evaluation of mortgage-backed and collateralized mortgage obligation (CMO) derivative securities for potential inclusion in several client portfolios. Langsford Investments mainly deals with equity investments and REITs, but the company recently purchased a small firm that invests mainly in fixed-income securities.

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Autumn should tell Lullum that the *most appropriate* models for valuing the option on mortgage-backed securities (MBS) and credit card asset-backed securities (ABS) are:

A) Monte Carlo for the MBS. No model is needed for the ABS.

B) Monte Carlo or binomial for the MBS, but binomial only for the ABS.

C) Monte Carlo for both the MBS and the ABS.

Question #15 of 78

MediSoft Inc. develops and distributes high-tech medical software used in hospitals and clinics across the United States and Canada. The firm's software provides an integrated solution to monitoring, analyzing, and managing output from a variety of diagnostic medical equipment including MRIs, CT scans, and EKG machines. MediSoft has grown rapidly since its inception ten years ago, averaging 25% growth in sales over the past decade. The company went public three years ago. Twelve months after its IPO, MediSoft made two semiannual coupon bond offerings, the first of which was a convertible bond. At the time of issuance, the convertible bond had a coupon rate of 7.25%, a par value of $1,000, a conversion price of $55.56, and ten years until maturity. Two years after issuance, the bond became callable at 102% of par value. Soon after the issuance of the convertible bond, the company issued another series of bonds, which were putable but contained no conversion or call features. The putable bonds were issued with a coupon of 8.0%, a par value of $1,000, and 15 years until maturity. One year after their issuance, the put feature of the putable bonds became active, allowing the bonds to be put at a price of 95% of par value, and increasing linearly over five yea rs to 100% of par value. MediSoft's convertible bonds are now trading in the market for a price of $947 with an estimated straight value of $917. The company's putable bonds are trading at a price of $1,052. Volatility in the price of MediSoft's common stock has been relatively high over the past few months. Currently, the stock is priced at $50 on the New York Stock Exchange and is expected to continue its annual dividend in the amount of $1.80 per share.

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> "Choosing to invest in MediSoft's convertible bond would benefit our portfolios in many ways, but the primary benefit is the limited downside risk associated with the bond. Because the straight value will provide a floor for the value of the convertible bond, downside risk is limited to the difference between the market price of the bond and the straight value."
>
> "Decreasing volatility in the price of MediSoft's common stock as well as increasing volatility in the level of interest rates are expected in the near future. The combined effects of these changes in volatility will be a decrease in the price of MediSoft's putable bonds and an increase in the price of the convertible bonds. Therefore, only the convertible bonds would be a suitable purchase."

Subsequent to purchasing one of the putable bonds for his portfolio, one of the managers at Brown & Associates realized that the bond contained a soft put. Which of the following securities cannot be used to redeem the bond in the event the bond becomes putable?

A) Shares of MediSoft's common stock.

B) MediSoft's 9.0% subordinated notes with a maturity of 10 years.

C) Thirty-year Treasury notes with a coupon of 4.5%.

Question #16 of 78

Mary Pierce, CFA, has just joined The James Group as a fixed income security analyst. Pierce has taken over for Katy Williams, who left The James Group to start her own investment firm. Pierce has been reviewing Williams's files, which include data on a number of securities that Williams had been reviewing.

The first file had information on several different asset-backed securities. A summary schedule that Williams had prepared is shown in Exhibit 1.

Exhibit 1: Summary Schedule

ecurity	Rating	Nominal Spread (bp)
GG Auto Loans	AA	124
KK Auto Loans	AA	118
CC Credit Card Receivables	AA	136
HH Home Equity Loans	AA	168
LL Home Equity Loans	AA	174

The second file included the following schedule of information relating to a specific CMO that Williams had been considering. Exhibit 2 reflects the results of a Monte Carlo simulation based on 15% volatility of interest rates. This security is still available, and Pierce needs to evaluate the investment merit of any or all of the listed tranches.

Exhibit 2: Monte Carlo Simulation Based on 15% Interest Rate Volatility

Tranche	Par Amount ($ million)	OAS (bp)	Z-Spread (bp)	Effective Duration (years)
PAC A	75.0	40	40	1.5
PAC B	40.0	43	95	4.2
PAC C	25.0	65	117	5.0
PAC D	50.0	72	140	7.9
Support S	100.0	51	142	11.8

A third file contained notes Williams had taken at a seminar a couple of months ago on valuing various types of asset-backed and mortgage-backed securities. These notes included the following comments that Pierce found interesting:

> "Cash flow yield (CFY) is one method of valuing mortgage-backed securities. An advantage of the CFY is that it does not rely on any specific prepayment assumptions. An important

weakness of CFY is the assumption that interim cash flows will be reinvested at the CFY. This is rarely true for mortgage-backed securities."

"Cash flow duration is similar to effective duration, but its weakness is that it fails to fully account for changes in prepayment rates as cash flow yields change. Empirical duration suffers two disadvantages as a measure of interest rate exposure: reliance on theoretical formulas and reliance on historical pricing data that may not exist for many mortgage-backed securities."

"The recent increase in the default rate for subprime adjustable rate mortgages can be traced to the structure of these loans. The negative amortization feature of these loans basically gave the borrower an at-the-money call option on their property. Once the property decreased in value, this call option was worthless, and the borrower had no incentive to make any additional payments."

The OAS in Exhibit 2 *most likely* reflect:

A) average spreads over the Treasury yield curve.

B) simple spreads over the Treasury yield curve.

C) average spreads over the Treasury spot rate curve.

Question #17 of 78

Sharon Rogner, CFA is evaluating three bonds for inclusion in fixed income portfolio for one of her pension fund clients. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable in two years and bond C is putable in two years. Rogner computes the OAS of bond A to be 50bps using a binomial tree with an assumed interest rate volatility of 15%.

If Rogner revises her estimate of interest rate volatility to 10%, the computed OAS of Bond B would *most likely* be:

A) lower than 50bps.

B) higher than 50bps.

C) equal to 50bps.

Question #18 of 78

Christopher Robinson, chairman of the board of directors for a private endowment fund, believes that the endowment fund for which he is responsible has diverged too far from its stated objectives. Over several years, the board has increased the size of the fund's equity position beyond the stated limits of the investment policy statement. In an effort to realign the fund's investments, Robinson has elected to choose a mortgage-backed security (MBS) for inclusion in the endowment's portfolio. After surveying the MBS market, Robinson has selected four MBS securities to present as potential investments at the next investment committee meeting. Details on the selected MBS securities are presented below:

MBS	Initial Principal ($millions)	Coupon Rate	Underlying Maturity (years)	Nominal Spread	OAS	Z-spread
W	250	7.0%	30	1.21%	0.28%	0.79%
X	175	7.8%	25	1.43%	0.49%	1.16%
Y	225	7.2%	20	1.62%	0.31%	1.12%
Z	190	8.0%	30	1.59%	0.40%	1.14%

At the investment committee meeting, a fellow board member raises his concerns over the potential MBS investments stating, "While we all agree that the fixed-income proportion of the endowment is much too small, I am not sure the suggested MBS securities will fulfill the cash flow requirements of the endowment. What risks are we taking on by allocating a portion of the portfolio to these investments? We cannot afford to end up with a timing mismatch between the cash needs of the endowment and the cash provided from its investments. Also, we have given no consideration to commercial mortgage-backed securities (CMBS). Isn't our analysis incomplete if we fail to give proper discussion of potential CMBS investment opportunities?"

Robinson responded to his fellow board member by addressing the board member's concerns as follows:

> "Because the cash requirements of the endowment fund fluctuate directly with interest rates, the cash flows provided from the MBS will provide adequate protection against cash shortfalls arising from differences in the timing of cash needs and cash sources. In addition, we can further reduce uncertainty surrounding the timing of cash flows by purchasing planned amortization class CMOs, which are securities issued against pools of MBS. CMBS were not presented due to the unacceptable risk profile of the comparable CMBS trading in the marketplace."

Of the four MBS securities under consideration, which MBS will add the *most* value relative to the risk associated with the security assuming the effective durations of the MBS securities is

approximately the same?

A) MBS-Y.

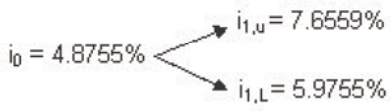
B) MBS-W.

C) MBS-X.

Eric Rome works in the back office at Finance Solutions, a limited liability firm that specializes in designing basic and sophisticated financial securities. Most of their clients are commercial and investment banks, and the detection, and control of interest rate risk is Financial Solution's competitive advantage.

One of their clients is looking to design a fairly straightforward security: a callable bond. The bond pays interest annually over a two-year life, has a 7% coupon payment, and has a par value of $100. The bond is callable in one year at par ($100).

Rome uses a binomial tree approach to value the callable bond. He's already determined, using a similar approach, that the value of the option-free counterpart is $102.196. This price came from discounting cash flows at on-the-run rates for the issuer. Those discount rates are given below:



Rome is also interested in the 2027 6% convertible bond of Stellar Inc. The bond can be converted into 25 shares of common stock and is trading at $1024. Stellar's current stock price is $32. Comparable nonconvertible bonds currently yield 6%.

Question #19 of 78

Using the binomial tree model, what is the value of the callable bond?

A) $101.735.

B) $95.521.

C) $102.196.

Question #20 of 78

What is the value of the call option embedded in this bond?

A) $0.461.

B) $6.675.

C) $12.924.

Question #21 of 78

If the bond is putable in one year at par, the value of the put is *closest* to:

A) $12.487.

B) $0.461.

C) $0.291.

Question #22 of 78

Which of the following steps that Rome might go through in calculating the effective duration of this callable bond is *least accurate*?

A) Given the assumptions about benchmark interest rates, interest rate volatility, and a call and/or put rule, calculate the OAS for the issue, using the binomial model.

B) Add the zero-volatility spread to each of the 1-year forward rates in the interest rate tree to get a "modified" tree.

C) Impose a small parallel shift to the interest rates used in the problem by an amount equal to $+\Delta$.

Question #23 of 78

If Rome revises his estimate of interest rate volatility used in generation of the interest rate tree upwards, the price of callable bond would *most likely*:

A) Increase.

B) Remain unchanged.

C) Fall.

Question #24 of 78

The market conversion premium ratio for Stellar's convertible bond is *closest* to:

A) 28%.

B) 2.40%

C) 20.6%.

Question #25 of 78

Natalia Berg, CFA, has estimated the key rate durations for several maturities in three of her $25 million bond portfolios, as shown in Exhibit 1.

Exhibit 1: Key Rate Durations for Three Fixed-Income Portfolios

Key Rate Maturity	Portfolio 1	Portfolio 2	Portfolio 3
2-year	2.45	0.35	1.26
5-year	0.20	0.40	1.27
10-year	0.15	4.00	1.23
20-year	2.20	0.25	1.24
Total	5.00	5.00	5.00

At a fixed-income conference in London, Berg hears a presentation by a university professor on the increasing use of the swap rate curve as a benchmark instead of the government bond yield curve. When Berg returns from the conference, she realizes she has left her notes from the presentation on the airplane. However, she is very interested in learning more about whether she should consider using the swap rate curve in her work.

As she tries to reconstruct what was said at the conference, she writes down two advantages to using the swap rate curve:

Statement 1: The swap rate curve typically has yield quotes at 11 maturities between 2 and 30 years. The U.S. government bond yield curve, however, has fewer on-the-run issues trading at maturities of at least two years.

Statement 2: Swap curves across countries are more comparable than government bond curves because they reflect similar levels of credit risk.

Berg also estimates the nominal spread, Z-spread, and option-adjusted spread (OAS) for the Steigers Corporation callable bonds in Portfolio 2. The OAS is estimated from a binomial interest rate tree. The results are shown in Exhibit 2.

Exhibit 2: Spread Measures for Steigers Corporation Callable Bonds

	Spread Measure	Benchmark
Nominal spread	25 basis points	Steigers Corp yield curve
Z-spread	35 basis points	Steigers Corp spot rate curve
OAS	−20 basis points	Steigers Corp spot rate curve
Nominal spread	120 basis points	Treasury yield curve

OAS	40 basis points	Treasury spot rate curve

Berg determines that to obtain an accurate estimate of the effective duration and effective convexity of a callable bond using a binomial model, the specified change in yield (i.e., Δy) must be equal to the OAS.

Berg also observes that the current Treasury bond yield curve is upward sloping. Based on this observation, Berg forecasts that short-term interest rates will increase.

Is Berg correct about the specified change in yield needed to obtain an accurate estimate of the effective duration and effective convexity of a callable bond using a binomial model?

A) No, because the specified change in yield must be larger than the option-adjusted spread (OAS).

B) No, because the specified change in yield can be larger than, smaller than, or equal to the OAS.

C) No, because the specified change in yield must be smaller than the OAS.

Question #26 of 78

Bill Moxley, CFA is evaluating three bonds for inclusion in fixed income portfolio for one of his pension fund clients. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable in two years and bond C is putable in two years. The yield curve is currently flat.

If the yield curve is expected to have a parallel downward shift, the bond with the highest price appreciation is *least likely* to be:

A) Bond C

B) Bond A

C) Bond B

Question #27 of 78

How does the value of a callable bond compare to a noncallable bond? The bond value is:

A) lower or higher.

B) higher.

C) lower.

Question #28 of 78

Which of the following is the appropriate "nodal decision" within the backward induction methodology of the interest tree framework for a putable bond?

A) Max(put price, discounted value).

B) Min(put value, discounted value).

C) Max(par value, discounted value).

Question #29 of 78

A callable bond, a putable bond, and an option-free bond have the same coupon, maturity and rating. The call price and put price are 98 and 102 respectively. The option-free bond trades at par. Which of the following lists *correctly* orders the values of the three bonds from lowest to highest?

A) Callable bond, option-free bond, putable bond.

B) Option-free bond, putable bond, callable bond.

C) Putable bond, option-free bond, callable bond.

Question #30 of 78

How is the value of the embedded call option of a callable bond determined? The value of the embedded call option is:

A) determined using the standard Black-Scholes model.

B) equal to the amount by which the callable bond value exceeds the option-free bond value.

C) the difference between the value of the option-free bond and the callable bond.

Question #31 of 78

For a putable bond, callable bond, or putable/callable bond, the nodal-decision process within the backward induction methodology of the interest rate tree framework requires that at each node the possible values will:

A) include the face value of the bond.

B) not be higher than the call price or lower than the put price.

C) be, in number, two plus the number of embedded options.

Question #32 of 78

The value of a convertible bond is most likely to be calculated as the value of an equivalent straight bond:

A) plus the value of a call option on the stock.

B) plus the value of a call option on the bond.

C) minus the value of a put option on the bond.

Question #33 of 78

Sharon Rogner, CFA is evaluating three bonds for inclusion in fixed income portfolio for one of her pension fund clients. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable in two years and bond C is putable in two years. Rogner computes the OAS of bond A to be 50bps using a binomial tree with an assumed interest rate volatility of 15%.

If Rogner revises her estimate of interest rate volatility to 10%, the computed OAS of Bond C would *most likely* be:

A) lower than 50bps.

B) higher than 50bps.

C) equal to 50bps.

Alnoor Hudda, CFA is valuing two floaters issued by Mateo Bank. Both floaters have a par value of $100, three year life and pay based on annual LIBOR. Hudda has generated the following binomial tree for libor.

1-year forward rates starting in year:

0	1	2
2%	5.7798%	6.0512%
	3.8743%	4.0562%
		2.7190%

Question #34 of 78

Value of a capped floater with a cap of 4% is closest to:

A) $98.70

B) $96.71

C) $97.38

Question #35 of 78

Value of the cap in a capped floater with a cap of 4% is closest to:

A) $1.29

B) $1.23

C) $4.41

Question #36 of 78

Using the following tree of semiannual interest rates what is the value of a 5% callable bond that has one year remaining to maturity, a call price of 99 and pays coupons semiannually?

	7.76%
6.20%	
	5.45%

A) 98.29.

B) 97.17.

C) 99.01.

Question #37 of 78

Bill Moxley, CFA is evaluating three bonds for inclusion in fixed income portfolio for one of his pension fund clients. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable in two years and bond C is putable in two years. The yield curve is currently flat.

If the yield curve becomes downward sloping, the bond with the highest price impact is *least likely* to be:

A) Bond B

B) Bond C

C) Bond A

Question #38 of 78

For a convertible bond, which of the following is *least* accurate?

A) A convertible bond may be putable.

B) The conversion ratio times the price per share of common stock is a lower limit on the bond's price.

C) The issuer can decide when to convert the bonds to stock.

Bill Woods, CFA, is a portfolio manager for Matrix Securities Fund, a closed-end bond fund that invests in U.S. Treasuries, mortgage-backed securities (MBS), asset-backed securities (ABS), and MBS derivatives. The fund has assets of approximately $400 million, has a current stock price of $14.50 and a net asset value (NAV) of $16.00. Woods is a member of a four person investment team that is responsible for all aspects of managing the portfolio, including interest rate forecasting, performing basic financial analysis and valuation of the portfolio, and selecting appropriate investments for Matrix. His expertise is in the analysis and valuation of MBS and ABS.

The fund pays a $0.12 monthly dividend that is paid from current income. The basic operating strategy of Matrix is to leverage its capital by investing in fixed income securities, and then financing those assets through repurchase agreements. Matrix then earns the spread between the net coupon of the underlying assets and the cost to finance the asset. Therefore, when evaluating a security for investment, it is critical that Matrix can be reasonably assured that it will earn a positive spread.

During the course of his analysis, Woods utilizes several methodologies to evaluate current portfolio holdings and potential investments. Valuation methods he uses include nominal spreads, Z-spreads, and option-adjusted spreads (OAS). There is ongoing debate among the investment team as to the merits and shortcomings of each of the methods. Woods believes that the OAS method is by far a superior tool in all circumstances, while his fellow portfolio manager, Yuri Ackerman, feels that each of the methods can at times serve a useful purpose. Wood and Ackerman's current discussion involves two similar FNMA adjustable-rate mortgage (ARM) securities Wood is considering purchasing. Both ARM "A" and ARM "B" are indexed off of 6-month LIBOR, are new production, and have similar net coupons.

Select Financial Information:

ARM	Net Coupon	WAM	Nominal Spread	OAS (bps)	Z-spread (bps)
A	6.27%	360	81	98	135
B	6.41%	358	95	116	129

Woods recommends that Matrix purchase ARM "A" with the 6.27% net coupon. He has based his conclusion on the calculated OAS of the securities, which he believes indicates that ARM "A" is the cheaper of the two securities. Ackerman disagrees with Woods, arguing that OAS is only one component of any analysis, and that a buy or sell recommendation should not be made based upon the OAS spread alone. Ackerman claims that other measures, such as one of the many duration measures and convexity, need to be incorporated into the analysis. He points out that both ARMs have equal convexities, but ARM "A" has a duration of 7.2 years and ARM "B" has duration of 6.8 years. These characteristics will affect the expected return in any interest rate scenario. Woods admits that he had not considered the differences in the bond's durations, and he acknowledges that others factors should be considered before a recommendation can be made.

Question #39 of 78

Woods is *most likely* resistant to the zero-volatility spread because the spread:

A) only considers one path of interest rates, the current Treasury spot rate curve.

B) does not indicate how much of the spread reflects the significant prepayment risk associated with MBS.

C) fails to consider price risk, which is uncertainty regarding terminal cash flows.

Question #40 of 78

In general, the investment team at Matrix attempts to buy "cheap" securities because they are undervalued on a relative basis. What is a characteristic of a "cheap" security for a given Z-spread and effective duration?

A) High OAS relative to the required OAS and high option costs.

B) High OAS relative to the required OAS and low option costs.

C) Low OAS relative to the required OAS and low option costs.

Question #41 of 78

Which of the two bonds Woods is considering purchasing has the greater interest rate exposure?

A) ARM B, because it has a smaller duration.

B) ARM A, because it has a larger duration.

C) The interest rate exposure cannot determine without a specific measure of convexity.

Question #42 of 78

Matrix also currently has investments in several ABS. Which of the following spread measures is *most appropriate* in the analysis of ABS backed by credit card receivables?

A) OAS, because the cash flows are interest rate path dependent.

B) Z-spread, because credit card ABS have no prepayment option.

C) Monte Carlo simulation model, because representative paths can be utilized.

Question #43 of 78

Which bonds would have its maturity-matched rate as its most critical rate?

A) High coupon callable bonds.

B) Low coupon callable bonds.

C) Low coupon putable bonds.

Question #44 of 78

Bill Moxley, CFA is evaluating three bonds for inclusion in fixed income portfolio for one of his pension fund clients. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable in two years and bond C is putable in two years. The yield curve is currently flat.

If the yield curve becomes upward sloping, the bond *least likely* to have the highest price impact would be:

A) Bond C

B) Bond B

C) Bond A

Question #45 of 78

Which of the following statements about how interest rate volatility affects the value bond is *most* accurate? When interest rate volatility increases, the value of a:

A) straight bond decreases.

B) callable bond decreases.

C) putable bond decreases

Question #46 of 78

Suppose the market price of a convertible security is $1,050 and the conversion ratio is 26.64. What is the market conversion price?

A) $39.41.

B) $1,050.00.

C) $26.64.

Question #47 of 78

For a convertible bond without any other options, the call feature implied by the convertibility feature will do all of the following EXCEPT:

A) place a lower limit on the possible values of the bond.

B) increase the value of the bond over that of a comparable option-free bond.

C) cause negative convexity.

Question #48 of 78

An analyst has constructed an interest rate tree for an on-the-run Treasury security. The analyst now wishes to use the tree to calculate the duration of the Treasury security. The usual way to do this is to estimate the changes in the bond's price associated with a:

A) parallel shift up and down of the forward rates implied by the binomial model.

B) shift up and down in the current one-year spot rate all else held constant.

C) parallel shift up and down of the yield curve.

Question #49 of 78

Mike Diffle has been asked to evaluate the bonds of Hardin, Inc. The specific issue Diffle is considering has an 8% annual coupon and matures in two years. The bonds are currently callable at 101, and beginning in six months, they are callable at par. Bratton Corporation, Hardin's competitor, also has bonds outstanding which are identical to Hardin's except that they are not callable. Diffle believes the AA rating of both bonds is an accurate reflection of their credit risk. Diffle is wondering if the Bratton bonds might be a better investment than the Hardin bonds. Assume that the following 1-year interest rate tree is used to value bonds with a maturity of up to three years (this tree assumes interest rate volatility of 10%).

Today	Year 1	Year 2
		9.324%
	8.530%	
7.250%		7.634%
	6.983%	
		6.250%

Also, assume that the appropriate spot rates for securities maturing in one, two, and three years are 7.25%, 7.5%, and 7.80%, respectively.

Diffle believes he should begin his analysis with the option-free Bratton bonds. He decides to consider two different approaches to valuing the Bratton Bonds—one that uses the current spot rate curve and another that uses the interest rate tree given above.

For the next step in his analysis, Diffle has decided to calculate the value of the Hardin bonds using the interest rate tree. His assumption is that the bond will be called at any node of the tree where the calculated value exceeds the call price. Diffle summarizes the results of his bond valuation analysis in a memo to his supervisor, Luke Puldo. In this memo, Diffle makes the following statements:

Statement 1:	The value of the option embedded in the Hardin bonds can be derived by simply subtracting the interest rate tree value of the Hardin bonds from the interest rate tree value of the Bratton bonds.
Statement 2:	I am concerned that the 10% volatility assumption used to develop the interest rate tree might be too low. A higher volatility assumption would result in a lower value for the Hardin bonds.

After reviewing Diffle's analysis, Puldo notes that Diffle has not included any information on the option adjusted spread (OAS) for the Hardin bonds. Puldo suggests that Diffle should evaluate the OAS in order to get an idea of the liquidity risk of the Hardin bonds. Diffle counters that the OAS may

not be very informative in this case, since he is uncertain as to the reliability of the interest rate volatility assumption.

To finish his analysis, Diffle would like to use his binomial model to evaluate the interest rate risk of both the Hardin bonds and the Bratton bonds. Diffle has shocked interest rates by 25 basis points throughout the interest rate tree he has been using to value the two bond issues. Using the new rates, Diffle has calculated values for the bonds assuming a 25-basis-point increase or decrease in rates. He plans to use these values as inputs into the following formulas for duration and convexity:

$$\text{duration} = \frac{V_- - V_+}{2 \times V_0 \times \Delta y} \qquad \text{convexity} = \frac{V_+ + V_- - 2V_0}{2 \times V_0 \times (\Delta y)^2}$$

Puldo still believes that Diffle must include the OAS for the Hardin bonds in his report. Puldo points out that a proper benchmark is critical to any OAS analysis. Which of the following statements regarding benchmark interest rates and OAS is *most* accurate? Since liquidity risk is a critical issue, the OAS calculation for the Hardin bonds should:

A) use on-the-run U.S. Treasury rates as a benchmark in order to isolate the credit risk of the Hardin bonds.

B) be based on a benchmark that has no credit risk.

C) use on-the-run interest rates for other callable Hardin bonds as a benchmark in order to isolate the liquidity risk of the 2-year bond issue.

Question #50 of 78

As the volatility of interest rates increases, the value of a callable bond will:

A) decline.

B) rise if the interest rate is below the coupon rate, and fall if the interest rate is above the coupon rate.

C) rise.

Question #51 of 78

As the volatility of interest rates increases, the value of a putable bond will:

A) rise if the interest rate is below the coupon rate, and fall if the interest rate is above the coupon rate.

B) rise.

C) decline.

Question #52 of 78

On a given day, a bond with a call provision rose in value by 1%. What can be said about the level and volatility of interest rates?

A) A possibility is that the level of interest rates remained constant, but the volatility of interest rates fell.

B) The only possible explanation is that level of interest rates fell.

C) A possibility is that the level of interest rates remained constant, but the volatility of interest rates rose.

Question #53 of 78

For an option-free bond trading at par, it is *least likely* that:

A) Its maturity key rate duration is the same as its effective duration.

B) The rate durations for all the rates other than the maturity-matched rate are zero.

C) The spot rate for the maturity of the bond is least important rate affecting the value of the bond.

Question #54 of 78

An analyst has constructed an interest rate tree for an on-the-run Treasury security. The analyst now wishes to use the tree to calculate the convexity of a callable corporate bond with maturity and coupon equal to that of the Treasury security. The usual way to do this is to calculate the option-adjusted spread (OAS):

A) compute the convexity of the Treasury security, and divide by (1+OAS).

B) shift the Treasury yield curve, compute the new forward rates, add the OAS to those forward rates, enter the adjusted values into the interest rate tree, and then use the usual convexity

C) compute the convexity of the Treasury security, and add the OAS.

Question #55 of 78

Using the following tree of semiannual interest rates what is the value of a putable semiannual bond that has one year remaining to maturity, a put price of 98 and a 4% coupon rate? The bond is putable today.

	7.59%
6.35%	
	5.33%

A) 97.92.

B) 98.75.

C) 98.00.

Question #56 of 78

If a bond's key rate durations for maturity points shorter than the bond's maturity are negative, it is *most likely* that the bond being analyzed is a:

A) Zero coupon bond.

B) Callable bond

C) Putable bond

Question #57 of 78

Joseph Dentice, CFA is evaluating three bonds. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable in two years and bond C is putable in two years.

If interest rates decrease, the duration of which bond is *most likely* to decrease?

A) Bond A.

B) Bond B.

C) Bond C.

Question #58 of 78

For a convertible bond with a call provision, with respect to the bond's convertibility feature and the call feature, the Black-Scholes option model can apply to:

A) neither features.

B) both features.

C) only one feature.

Question #59 of 78

A callable bond and an option-free bond have the same coupon, maturity and rating. The callable bond currently trades at par value. Which of the following lists *correctly* orders the values of the indicated items from lowest to highest?

A) Embedded call, callable bond, $0, option-free bond.

B) $0, embedded call, callable bond, option-free bond.

C) Embedded call, $0, callable bond, option-free bond.

Question #60 of 78

Using the following binomial interest rate tree, calculate the value of a two-year, 2.5% putable bond. The American style embedded put option can be exercised anytime and has a strike price of 99. The value is *closest* to:

	3.75%
3.175%	
	2.665%

A) 99.00.

B) 98.75.

C) 97.92.

Question #61 of 78

A CFA charter holder observes a 12-year 7 ¾ percent semiannual coupon bond trading at 102.9525. If interest rates *rise* immediately by 50 basis points the bond will sell for 99.0409. If interest rates *fall* immediately by 50 basis points the bond will sell for 107.0719. What are the bond's effective duration (ED) and effective convexity (EC).

A) ED = 7.801, EC = 80.73.

B) ED = 40.368, EC = 7.801.

C) ED = 8.031, EC = 2445.120.

Question #62 of 78

The value of a callable bond is equal to the:

A) callable bond value minus the value of the put option minus the value of the call option.

B) callable bond plus the value of the embedded call option.

C) option-free bond value minus the value of the call option.

Question #63 of 78

Which of the following is equal to the value of the putable bond? The putable bond value is equal to the:

A) callable bond plus the value of the put option.

B) option-free bond value minus the value of the put option.

C) option-free bond value plus the value of the put option.

Question #64 of 78

Generally speaking, an analyst would like the option adjusted spread (OAS) to be large, controlling for:

A) Credit and liquidity risk.

B) Option risk.

C) Credit, liquidity and option risk.

Question #65 of 78

The primary benefit of owning a convertible bond over owning the common stock of a corporation is the:

A) bond has lower downside risk.

B) conversion premium.

C) bond has more upside potential.

Question #66 of 78

Kylie Autumn, CFA, is a consultant with Tri-Vision Group. Robert Lullum, Senior Vice President at Langsford Investments, has asked for assistance with the evaluation of mortgage-backed and collateralized mortgage obligation (CMO) derivative securities for potential inclusion in several client portfolios. Langsford Investments mainly deals with equity investments and REITs, but the company recently purchased a small firm that invests mainly in fixed-income securities.

Lullum has done some research on the appropriate spread measures and option valuation models for fixed-income securities and wants to clarify some points. He wants to know if the following statements are correct:

Statement 1:	The proper spread measure for option-free corporate bonds is the nominal spread.
Statement 2:	Callable corporate bonds and mortgage-backed securities should be measured using the option-added spread.
Statement 3:	The Z-spread is appropriate for credit card ABS and auto loan ABS.

While Lullum meets with Autumn, Janet Van Ark, CFA charterholder and equity income portfolio manager for Langsford, is attempting to purchase bonds that may also provide her with equity exposure in the future. She has decided to analyze an 8% annual coupon bond with exactly 20 years to maturity. The bonds are convertible into 10 common shares for each $1,000 of par (face) value. The bond's market price is $920, and the common stock has a market price of $40. VanArk estimates that the stock will increase in value to $70 within the next two years. The stock's annual dividend is $0.40 per share, and the market yield on comparable non-convertible bonds is 9.5%.

Carl Leighton, a Langsford analyst and Level II CFA candidate, works with mortgage-backed and other asset-based securities. He provides Lullum with a list of credit enhancements for asset-backed securities, which includes letters of credit, excess servicing spread funds, overcollateralization, and bond insurance. Lullum then asks him for a status report of the firm's exposure to paythrough securities. He also asks Leighton to calculate the single-monthly mortality rate (SMM) and estimate the prepayment for the month for a seasoned mortgage pool with a $500,000 principal balance remaining. The scheduled monthly principal payment is $150 and the conditional prepayment rate (CPR) is 7%.

Van Ark computes the convertible bond's market conversion premium per share (MCPPS) using only the information given, and then wants to know how a sudden increase in the stock price of $2 would impact the bond price. Which of the following choices is *most* correct?

A) The sudden $2 increase would have a small effect.

B) The original MCPPS is $60 per share.

C) The sudden $2 increase would have a large effect.

Question #67 of 78

Which of the following *most accurately* explains how the effective convexity is computed using the binomial model. In order to compute the effective convexity the:

A) volatility has to be shifted upward and downward and the binomial tree recalculated each time.

B) binomial tree has to be shifted upward and downward by the same amount for all nodes.

C) yield curve has to be shifted upward and downward in a parallel manner and the binomial tree recalculated each time.

Question #68 of 78

Joseph Dentice, CFA is evaluating three bonds. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable in two years and bond C is putable in two years.

If interest rates increase, the duration of which bond is *most likely* to decrease?

A) Bond B.

B) Bond A.

C) Bond C.

Question #69 of 78

Joseph Dentice, CFA is evaluating three bonds. All three bonds have a coupon rate of 3%, maturity of five years and are generally identical in every respect except that bond A is an option-free bond, bond B is callable in two years and bond C is putable in two years.

The bond with the lowest duration is *least likely* to be:

A) Bond C.

B) Bond B.

C) Bond A.

Question #70 of 78

Which of the following is equal to the value of a noncallable / nonputable convertible bond? The value of the corresponding:

A) straight bond plus the value of the call option on the stock.

B) callable bond plus the value of the call option on the stock.

C) straight bond.

Question #71 of 78

Which of the following *correctly* describes one of the basic features of a convertible bond? A convertible bond is a security that can be converted into:

A) common stock at the option of the issuer.

B) common stock at the option of the investor.

C) another bond at the option of the issuer.

Question #72 of 78

Which of the following is the appropriate "nodal decision" within the backward induction methodology of the interest tree framework for a callable bond?

A) Max(call price, discounted value).

B) Min(call price, discounted value).

C) Min(par value, discounted value).

Question #73 of 78

A callable bond and an option-free bond have the same coupon, maturity and rating. The callable bond currently trades at par value. Which of the following lists *correctly* orders the values of the indicated items from lowest to highest?

A) $0, embedded call, callable bond, option-free bond.

B) Embedded call, callable bond, $0, option-free bond.

C) Embedded call, $0, callable bond, option-free bond.

Question #74 of 78

A putable bond with a 6.4% annual coupon will mature in two years at par value. The current one-year spot rate is 7.6%. For the second year, the yield volatility model forecasts that the one-year rate will be either 6.8% or 7.6%. The bond is putable in one year at 99. Using a binomial interest rate tree, what is the current price?

A) 98.885.

B) 98.246.

C) 98.190.

Question #75 of 78

Using the following tree of semiannual interest rates what is the value of a callable bond that has one year remaining to maturity, a call price of 99 and a 5% coupon rate that pays semiannually?

	7.59%
6.35%	
	5.33%

A) 99.21.

B) 98.26.

C) 98.65.

Question #76 of 78

A convertible bond has a conversion ratio of 12 and a straight value of $1,010. The market value of the bond is $1,055, and the market value of the stock is $75. What is the market conversion price and premium over straight value of the bond?

	Market conversion price	Premium over straight value
A)	$87.92	0.0446
B)	$75.00	0.1029
C)	$84.17	0.1222

Question #77 of 78

Patrick Wall is a new associate at a large international financial institution. His boss, C.D. Johnson, is responsible for familiarizing Wall with the basics of fixed income investing. Johnson asks Wall to evaluate the two otherwise identical bonds shown in Table 1. The callable bond is callable at 100 and exercisable on the coupon dates only.

Wall is told to evaluate the bonds with respect to duration and convexity when interest rates decline by 50 basis points at all maturities over the next six months.

Johnson supplies Wall with the requisite interest rate tree shown in Figure 1. Johnson explains to Wall that the prices of the bonds in Table 1 were computed using the interest rate lattice. Johnson instructs Wall to try and replicate the information in Table 1 and use his analysis to derive an investment decision for his portfolio.

Table 1 Bond Descriptions

	Non-callable Bond	Callable Bond
Price	$100.83	$98.79
Time to Maturity (years)	5	5
Time to First Call Date	--	0
Annual Coupon	$6.25	$6.25
Interest Payment	Semi-annual	Semi-annual
Yield to Maturity	6.0547%	6.5366%
Price Value per Basis Point	428.0360	--

Figure 1

									15.44%
								14.10%	
							12.69%		12.46%
						11.85%		11.38%	
					9.75%		10.25%		10.05%
				8.95%		9.57%		9.19%	
			7.91%		7.88%		8.28%		8.11%
		7.35%		7.23%		7.74%		7.42%	
	6.62%		6.40%		6.37%		6.69%		6.54%
6.05%		5.95%		5.85%		6.25%		5.99%	
	5.36%		5.17%		5.15%		5.40%		5.28%

		4.81%		4.73%		5.05%		4.83%	
			4.18%		4.16%		4.36%		4.26%
				3.82%		4.08%		3.90%	
					3.37%		3.52%		3.44%
						3.30%		3.15%	
							2.84%		2.77%
								2.54%	
									2.24%
Years	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5

Given the following relevant part of the interest rate tree, the value of the callable bond at node A is *closest* to:

	3.44%
3.15%	
	2.77%

A) $100.00.

B) $103.56

C) $101.53.

Question #78 of 78

A callable bond with an 8.2% annual coupon will mature in two years at par value. The current one-year spot rate is 7.9%. For the second year, the yield-volatility model forecasts that the one-year rate will be either 6.8% or 7.6%. The call price is 101. Using a binomial interest rate tree, what is the current price?

A) 101.000.

B) 100.279.

C) 100.558.