Fixed Income

The Term Structure and Interest Rate Dynamics

The candidate should be able to:

☐ describe relationships among spot rates, forward rates, yield to maturity, expected and realized returns on bonds, and the shape of the yield curve

☐ describe how zero-coupon rates (spot rates) may be obtained from the par curve by bootstrapping

☐ describe the assumptions concerning the evolution of spot rates in relation to forward rates implicit in active bond portfolio management

☐ describe the strategy of rolling down the yield curve

☐ explain the swap rate curve and why and how market participants use it in valuation

☐ calculate and interpret the swap spread for a given maturity

☐ describe short-term interest rate spreads used to gauge economy-wide credit risk and liquidity risk

☐ explain traditional theories of the term structure of interest rates and describe the implications of each theory for forward rates and the shape of the yield curve

☐ explain how a bond's exposure to each of the factors driving the yield curve can be measured and how these exposures can be used to manage yield curve risks

☐ explain the maturity structure of yield volatilities and their effect on price volatility

☐ explain how key economic factors are used to establish a view on benchmark rates, spreads, and yield curve changes

The Arbitrage-Free Valuation Framework

The candidate should be able to:

☐ explain what is meant by arbitrage-free valuation of a fixed-income instrument
☐ calculate the arbitrage-free value of an option-free, fixed-rate coupon bond
☐ describe a binomial interest rate tree framework
☐ describe the process of calibrating a binomial interest rate tree to match a specific term structure
☐ describe the backward induction valuation methodology and calculate the value of a fixed-income instrument given its cash flow at each node
☐ compare pricing using the zero-coupon yield curve with pricing using an arbitrage-free binomial lattice
☐ describe pathwise valuation in a binomial interest rate framework and calculate the value of a fixed-income instrument given its cash flows along each path
☐ describe a Monte Carlo forward-rate simulation and its application
☐ describe term structure models and how they are used

Valuation and Analysis of Bonds with Embedded Options

The candidate should be able to:

☐ describe fixed-income securities with embedded options
☐ explain the relationships between the values of a callable or putable bond, the underlying option-free (straight) bond, and the embedded option
☐ describe how the arbitrage-free framework can be used to value a bond with embedded options
☐ explain how interest rate volatility affects the value of a callable or putable bond
☐ explain how changes in the level and shape of the yield curve affect the value of a callable or putable bond
☐ calculate the value of a callable or putable bond from an interest rate tree
☐ explain the calculation and use of option-adjusted spreads
☐ explain how interest rate volatility affects option-adjusted spreads
☐ calculate and interpret effective duration of a callable or putable bond
☐ compare effective durations of callable, putable, and straight bonds
☐ describe the use of one-sided durations and key rate durations to evaluate the interest rate sensitivity of bonds with embedded options
☐ compare effective convexities of callable, putable, and straight bonds
☐ calculate the value of a capped or floored floating-rate bond
☐ describe defining features of a convertible bond
☐ calculate and interpret the components of a convertible bond's value
☐ describe how a convertible bond is valued in an arbitrage-free framework
☐ compare the risk–return characteristics of a convertible bond with the risk–return characteristics of a straight bond and of the underlying common stock

Credit Analysis Models

The candidate should be able to:

☐ explain expected exposure, the loss given default, the probability of default, and the credit valuation adjustment
☐ explain credit scores and credit ratings
☐ calculate the expected return on a bond given transition in its credit rating
☐ explain structural and reduced-form models of corporate credit risk, including assumptions, strengths, and weaknesses
☐ calculate the value of a bond and its credit spread, given assumptions about the credit risk parameters
☐ interpret changes in a credit spread

□ explain the determinants of the term structure of credit spreads and interpret a term structure of credit spreads
□ compare the credit analysis required for securitized debt to the credit analysis of corporate debt

Credit Default Swaps

The candidate should be able to:

□ describe credit default swaps (CDS), single-name and index CDS, and the parameters that define a given CDS product
□ describe credit events and settlement protocols with respect to CDS
□ explain the principles underlying and factors that influence the market's pricing of CDS
□ describe the use of CDS to manage credit exposures and to express views regarding changes in the shape and/or level of the credit curve
□ describe the use of CDS to take advantage of valuation disparities among separate markets, such as bonds, loans, equities, and equity-linked instruments