Appendix I

CFA Level I Mapping to ESMA Final Knowledge and Competency Guidelines

ESMA Final Knowledge and Competency Guidelines | **CFA Level I LOS**

V.III Criteria for knowledge and competence for staff giving investment advice

18. Firms should ensure that staff giving investment advice have the necessary knowledge and competence to:

a. understand the key characteristics, risk and features of the investment products being offered or recommended, including any general tax implications to be incurred by the client in the context of transactions. Particular care should be taken when providing advice with respect to products characterised by higher levels of complexity;	49 a. describe characteristics of types of equity securities;
	b. describe differences in voting rights and other ownership characteristics among different equity classes;
	c. distinguish between public and private equity securities;
	d. describe methods for investing in non-domestic equity securities;

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e. compare the risk and return characteristics of different types of equity securities;
52 a. describe basic features of a fixed-income security;
b. describe content of a bond indenture;
c. compare affirmative and negative covenants and identify examples of each;
d. describe how legal, regulatory, and tax considerations affect the issuance and trading of fixed-income securities;
e. describe how cash flows of fixed-income securities are structured;
f. describe contingency provisions affecting the timing and/or nature of cash flows of fixed-income securities and identify whether such provisions benefit the borrower or the lender.
56 a. calculate and interpret the sources of return from investing in a fixed-rate bond;
b. define, calculate, and interpret Macaulay, modified, and effective durations;
c. explain why effective duration is the most appropriate measure of interest rate risk for bonds with embedded options;
d. define key rate duration and describe the use of key rate durations in measuring the sensitivity of bonds to changes in the shape of the benchmark yield curve;

e. explain how a bond's maturity, coupon, and yield level affect its interest rate risk;
f. calculate the duration of a portfolio and explain the limitations of portfolio duration;
g. calculate and interpret the money duration of a bond and price value of a basis point (PVBP);
h. calculate and interpret approximate convexity and distinguish between approximate and effective convexity;
i. estimate the percentage price change of a bond for a specified change in yield, given the bond's approximate duration and convexity;
j. describe how the term structure of yield volatility affects the interest rate risk of a bond;
k. describe the relationships among a bond's holding period return, its duration, and the investment horizon;
l. explain how changes in credit spread and liquidity affect yield-to-maturity of a bond and how duration and convexity can be used to estimate the price effect of the changes.
61 a. compare alternative investments with traditional investments;
b. describe categories of alternative investments;
c. describe potential benefits of alternative investments in the context of portfolio management;

	d. describe hedge funds, private equity, real estate, commodities, infrastructure, and other alternative investments, including, as applicable, strategies, sub-categories, potential benefits and risks, fee structures, and due diligence;
	e. describe, calculate, and interpret management and incentive fees and net-of-fees returns to hedge funds;
	f. describe issues in valuing and calculating returns on hedge funds, private equity, real estate, commodities, and infrastructure;
	g. describe risk management of alternative investments.
	45 e. describe the investment constraints of liquidity, time horizon, tax concerns, legal and regulatory factors, and unique circumstances and their implications for the choice of portfolio assets;
b. understand the total costs and charges to be incurred by the client in the context of the type of investment product being offered or recommended and the costs related to the provision of the advice and any other related services being provided;	46 a. explain the main functions of the financial system;
	b. describe classifications of assets and markets;
	c. describe the major types of securities, currencies, contracts, commodities, and real assets that trade in organized markets, including their distinguishing characteristics and major subtypes;
	d. describe types of financial intermediaries and services that they provide;

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	e. compare positions an investor can take in an asset;
	f. calculate and interpret the leverage ratio, the rate of return on a margin transaction, and the security price at which the investor would receive a margin call;
	g. compare execution, validity, and clearing instructions;
	h. compare market orders with limit orders;
	41 d. describe the steps in the portfolio management process;
	45 a. describe the reasons for a written investment policy statement (IPS);
	b. describe the major components of an IPS;
	c. describe risk and return objectives and how they may be developed for a client;
	d. distinguish between the willingness and the ability (capacity) to take risk in analyzing an investor's financial risk tolerance;
	e. describe the investment constraints of liquidity, time horizon, tax concerns, legal and regulatory factors, and unique circumstances and their implications for the choice of portfolio assets;
	f. explain the specification of asset classes in relation to asset allocation;
	g. describe the principles of portfolio construction and the role of asset allocation in relation to the IPS.

c. fulfil the obligations required by firms in relation the suitability requirements including the obligations as set out in the Guidelines on certain aspects of the MiFID suitability requirements8;	1 a. describe the structure of the CFA Institute Professional Conduct Program and the process for the enforcement of the Code and Standards;
	b. state the six components of the Code of Ethics and the seven Standards of Professional Conduct;
	c. explain the ethical responsibilities required by the Code and Standards, including the sub-sections of each Standard.
	2 a. demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity;
	b. distinguish between conduct that conforms to the Code and Standards and conduct that violates the Code and Standards;
	c. recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct.
	45 a. describe the reasons for a written investment policy statement (IPS);
	b. describe the major components of an IPS;
	c. describe risk and return objectives and how they may be developed for a client;
	d. distinguish between the willingness and the ability (capacity) to take risk in analyzing an investor's financial risk tolerance;

	e. describe the investment constraints of liquidity, time horizon, tax concerns, legal and regulatory factors, and unique circumstances and their implications for the choice of portfolio assets;
	f. explain the specification of asset classes in relation to asset allocation;
	g. describe the principles of portfolio construction and the role of asset allocation in relation to the IPS.
d. understand how the type of investment product provided by the firm may not be suitable for the client, having assessed the relevant information provided by the client against potential changes that may have occurred since the relevant information was gathered;	1 a. describe the structure of the CFA Institute Professional Conduct Program and the process for the enforcement of the Code and Standards;
	b. state the six components of the Code of Ethics and the seven Standards of Professional Conduct;
	c. explain the ethical responsibilities required by the Code and Standards, including the sub-sections of each Standard.
	2 a. demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity;
	b. distinguish between conduct that conforms to the Code and Standards and conduct that violates the Code and Standards;
	c. recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct.

	41 a. describe the portfolio approach to investing;
	b. describe types of investors and distinctive characteristics and needs of each;
	c. describe defined contribution and defined benefit pension plans;
	d. describe the steps in the portfolio management process;
	e. describe mutual funds and compare them with other pooled investment products.
	45 a. describe the reasons for a written investment policy statement (IPS);
	b. describe the major components of an IPS;
	c. describe risk and return objectives and how they may be developed for a client;
	d. distinguish between the willingness and the ability (capacity) to take risk in analyzing an investor's financial risk tolerance;
	e. describe the investment constraints of liquidity, time horizon, tax concerns, legal and regulatory factors, and unique circumstances and their implications for the choice of portfolio assets;
	f. explain the specification of asset classes in relation to asset allocation;
	g. describe the principles of portfolio construction and the role of asset allocation in relation to the IPS.

e. understand how financial markets function and how they affect the value and pricing investment products offered or recommended to clients;	46 a. explain the main functions of the financial system;
	b. describe classifications of assets and markets;
	c. describe the major types of securities, currencies, contracts, commodities, and real assets that trade in organized markets, including their distinguishing characteristics and major subtypes;
	d. describe types of financial intermediaries and services that they provide;
	e. compare positions an investor can take in an asset;
	f. calculate and interpret the leverage ratio, the rate of return on a margin transaction, and the security price at which the investor would receive a margin call;
	g. compare execution, validity, and clearing instructions;
	h. compare market orders with limit orders;
	i. define primary and secondary markets and explain how secondary markets support primary markets;
	j. describe how securities, contracts, and currencies are traded in quote-driven, order-driven, and brokered markets;
	k. describe characteristics of a well-functioning financial system;
	l. describe objectives of market regulation.

f. understand the impact of economic figures, national/regional/global events on markets and on the value of investment products being offered or recommended to clients;	17 a. calculate and explain gross domestic product (GDP) using expenditure and income approaches;
	b. compare the sum-of-value-added and value-of-final-output methods of calculating GDP;
	c. compare nominal and real GDP and calculate and interpret the GDP deflator;
	d. compare GDP, national income, personal income, and personal disposable income;
	e. explain the fundamental relationship among saving, investment, the fiscal balance, and the trade balance;
	f. explain the IS and LM curves and how they combine to generate the aggregate demand curve;
	g. explain the aggregate supply curve in the short run and long run;
	h. explain causes of movements along and shifts in aggregate demand and supply curves;
	i. describe how fluctuations in aggregate demand and aggregate supply cause short-run changes in the economy and the business cycle;
	j. distinguish between the following types of macroeconomic equilibria: long-run full employment, short-run recessionary gap, short-run inflationary gap, and short-run stagflation;

k. explain how a short-run macroeconomic equilibrium may occur at a level above or below full employment;
l. analyze the effect of combined changes in aggregate supply and demand on the economy;
m. describe sources, measurement, and sustainability of economic growth;
n. describe the production function approach to analyzing the sources of economic growth;
o. distinguish between input growth and growth of total factor productivity as components of economic growth.
18 a. describe the business cycle and its phases;
b. describe how resource use, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle;
c. describe theories of the business cycle;
d. describe types of unemployment and measures of unemployment;
e. explain inflation, hyperinflation, disinflation, and deflation;
f. explain the construction of indices used to measure inflation;
g. compare inflation measures, including their uses and limitations;
h. distinguish between cost-push and demand-pull inflation;

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i. describe economic indicators, including their uses and limitations.
19 a. compare monetary and fiscal policy;
b. describe functions and definitions of money;
c. explain the money creation process;
d. describe theories of the demand for and supply of money;
e. describe the Fisher effect;
f. describe roles and objectives of central banks;
g. contrast the costs of expected and unexpected inflation;
h. describe tools used to implement monetary policy;
i. describe the monetary transmission mechanism;
j. describe qualities of effective central banks;
k. explain the relationships between monetary policy and economic growth, inflation, interest, and exchange rates;
l. contrast the use of inflation, interest rate, and exchange rate targeting by central banks;
m. determine whether a monetary policy is expansionary or contractionary;
n. describe limitations of monetary policy;
o. describe roles and objectives of fiscal policy;
p. describe tools of fiscal policy, including their advantages and disadvantages;

q. describe the arguments about whether the size of a national debt relative to GDP matters;
r. explain the implementation of fiscal policy and difficulties of implementation;
s. determine whether a fiscal policy is expansionary or contractionary;
t. explain the interaction of monetary and fiscal policy.
20 a. compare gross domestic product and gross national product;
b. describe benefits and costs of international trade;
c. distinguish between comparative advantage and absolute advantage;
d. explain the Ricardian and Heckscher–Ohlin models of trade and the source(s) of comparative advantage in each model;
e. compare types of trade and capital restrictions and their economic implications;
f. explain motivations for and advantages of trading blocs, common markets, and economic unions;
g. describe common objectives of capital restrictions imposed by governments;
h. describe the balance of payments accounts including their components;
i. explain how decisions by consumers, firms, and governments affect the balance of payments;

	j. describe functions and objectives of the international organizations that facilitate trade, including the World Bank, the International Monetary Fund, and the World Trade Organization.
	21 a. define an exchange rate and distinguish between nominal and real exchange rates and spot and forward exchange rates;
	b. describe functions of and participants in the foreign exchange market;
	c. calculate and interpret the percentage change in a currency relative to another currency;
	d. calculate and interpret currency cross-rates;
	e. convert forward quotations expressed on a points basis or in percentage terms into an outright forward quotation;
	f. explain the arbitrage relationship between spot rates, forward rates, and interest rates;
	g. calculate and interpret a forward discount or premium;
	h. calculate and interpret the forward rate consistent with the spot rate and the interest rate in each currency;
	i. describe exchange rate regimes;
	j. explain the effects of exchange rates on countries' international trade and capital flows.

g. understand the difference between past performance and future performance scenarios as well as the limits of predictive forecasting;	7 a. distinguish between descriptive statistics and inferential statistics, between a population and a sample, and among the types of measurement scales;
	b. define a parameter, a sample statistic, and a frequency distribution;
	c. calculate and interpret relative frequencies and cumulative relative frequencies, given a frequency distribution;
	d. describe the properties of a data set presented as a histogram or a frequency polygon;
	e. calculate and interpret measures of central tendency, including the population mean, sample mean, arithmetic mean, weighted average or mean, geometric mean, harmonic mean, median, and mode;
	f. calculate and interpret quartiles, quintiles, deciles, and percentiles;
	g. calculate and interpret 1) a range and a mean absolute deviation and 2) the variance and standard deviation of a population and of a sample;
	h. calculate and interpret the proportion of observations falling within a specified number of standard deviations of the mean using Chebyshev's inequality;
	i. calculate and interpret the coefficient of variation and the Sharpe ratio;

j. explain skewness and the meaning of a positively or negatively skewed return distribution;
k. describe the relative locations of the mean, median, and mode for a unimodal, nonsymmetrical distribution;
l. explain measures of sample skewness and kurtosis;
m. compare the use of arithmetic and geometric means when analyzing investment returns.
8 a. define a random variable, an outcome, an event, mutually exclusive events, and exhaustive events;
b. state the two defining properties of probability and distinguish among empirical, subjective, and a priori probabilities;
c. state the probability of an event in terms of odds for and against the event;
d. distinguish between unconditional and conditional probabilities;
e. explain the multiplication, addition, and total probability rules;
f. calculate and interpret 1) the joint probability of two events, 2) the probability that at least one of two events will occur, given the probability of each and the joint probability of the two events, and 3) a joint probability of any number of independent events;
g. distinguish between dependent and independent events;

	h. calculate and interpret an unconditional probability using the total probability rule;
	i. explain the use of conditional expectation in investment applications;
	j. explain the use of a tree diagram to represent an investment problem;
	k. calculate and interpret covariance and correlation;
	l. calculate and interpret the expected value, variance, and standard deviation of a random variable and of returns on a portfolio;
	m. calculate and interpret covariance given a joint probability function;
	n. calculate and interpret an updated probability using Bayes' formula;
	o. identify the most appropriate method to solve a particular counting problem and solve counting problems using factorial, combination, and permutation concepts.
h. understand issues relating to market abuse and anti-money laundering;	1 a. describe the structure of the CFA Institute Professional Conduct Program and the process for the enforcement of the Code and Standards;
	b. state the six components of the Code of Ethics and the seven Standards of Professional Conduct;
	c. explain the ethical responsibilities required by the Code and Standards, including the sub-sections of each Standard.

	2 a. demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity;
	b. distinguish between conduct that conforms to the Code and Standards and conduct that violates the Code and Standards;
	c. recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct.
i. assess data relevant to the type investment products offered or recommended to clients such as Key Investor Information Documents, prospectuses, financial statements, or financial data;	22 a. describe the roles of financial reporting and financial statement analysis;
	b. describe the roles of the statement of financial position, statement of comprehensive income, statement of changes in equity, and statement of cash flows in evaluating a company's performance and financial position;
	c. describe the importance of financial statement notes and supplementary information—including disclosures of accounting policies, methods, and estimates—and management's commentary;
	d. describe the objective of audits of financial statements, the types of audit reports, and the importance of effective internal controls;

e. identify and describe information sources that analysts use in financial statement analysis besides annual financial statements and supplementary information;
23 a. describe how business activities are classified for financial reporting purposes;
b. explain the relationship of financial statement elements and accounts, and classify accounts into the financial statement elements;
c. explain the accounting equation in its basic and expanded forms;
d. describe the process of recording business transactions using an accounting system based on the accounting equation;
e. describe the need for accruals and valuation adjustments in preparing financial statements;
f. describe the relationships among the income statement, balance sheet, statement of cash flows, and statement of owners' equity;
g. describe the flow of information in an accounting system;
h. describe the use of the results of the accounting process in security analysis.
24 a. describe the objective of financial statements and the importance of financial reporting standards in security analysis and valuation;

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b. describe roles and desirable attributes of financial reporting standard-setting bodies and regulatory authorities in establishing and enforcing reporting standards, and describe the role of the International Organization of Securities Commissions;
c. describe the status of global convergence of accounting standards and ongoing barriers to developing one universally accepted set of financial reporting standards;
d. describe the International Accounting Standards Board's conceptual framework, including the objective and qualitative characteristics of financial statements, required reporting elements, and constraints and assumptions in preparing financial statements;
e. describe general requirements for financial statements under International Financial Reporting Standards (IFRS);
f. compare key concepts of financial reporting standards under IFRS and US generally accepted accounting principles (US GAAP) reporting systems;
g. identify characteristics of a coherent financial reporting framework and the barriers to creating such a framework;
h. describe implications for financial analysis of differing financial reporting systems and the importance of monitoring developments in financial reporting standards;

i. analyze company disclosures of significant accounting policies.
25 a. describe the components of the income statement and alternative presentation formats of that statement;
b. describe general principles of revenue recognition and accrual accounting, specific revenue recognition applications (including accounting for long-term contracts, installment sales, barter transactions, gross and net reporting of revenue), and implications of revenue recognition principles for financial analysis;
c. calculate revenue given information that might influence the choice of revenue recognition method;
d. describe key aspects of the converged accounting standards issued by the International Accounting Standards Board and Financial Accounting Standards Board in May 2014;
e. describe general principles of expense recognition, specific expense recognition applications, and implications of expense recognition choices for financial analysis;
f. describe the financial reporting treatment and analysis of non-recurring items (including discontinued operations, extraordinary items, unusual or infrequent items) and changes in accounting policies;
g. distinguish between the operating and non-operating components of the income statement;

h. describe how earnings per share is calculated and calculate and interpret a company's earnings per share (both basic and diluted earnings per share) for both simple and complex capital structures;
i. distinguish between dilutive and antidilutive securities and describe the implications of each for the earnings per share calculation;
j. convert income statements to common-size income statements;
k. evaluate a company's financial performance using common-size income statements and financial ratios based on the income statement;
l. describe, calculate, and interpret comprehensive income;
m. describe other comprehensive income and identify major types of items included in it.
26 a. describe the elements of the balance sheet: assets, liabilities, and equity;
b. describe uses and limitations of the balance sheet in financial analysis;
c. describe alternative formats of balance sheet presentation;
d. distinguish between current and non-current assets and current and non-current liabilities;
e. describe different types of assets and liabilities and the measurement bases of each;

f. describe the components of shareholders' equity;
g. convert balance sheets to common-size balance sheets and interpret common-size balance sheets;
h. calculate and interpret liquidity and solvency ratios.
27 a. compare cash flows from operating, investing, and financing activities and classify cash flow items as relating to one of those three categories given a description of the items;
b. describe how non-cash investing and financing activities are reported;
c. contrast cash flow statements prepared under International Financial Reporting Standards (IFRS) and US generally accepted accounting principles (US GAAP);
d. distinguish between the direct and indirect methods of presenting cash from operating activities and describe arguments in favor of each method;
e. describe how the cash flow statement is linked to the income statement and the balance sheet;
f. describe the steps in the preparation of direct and indirect cash flow statements, including how cash flows can be computed using income statement and balance sheet data;
g. convert cash flows from the indirect to direct method;

h. analyze and interpret both reported and common-size cash flow statements;
i. calculate and interpret free cash flow to the firm, free cash flow to equity, and performance and coverage cash flow ratios.
28 a. describe tools and techniques used in financial analysis, including their uses and limitations;
b. classify, calculate, and interpret activity, liquidity, solvency, profitability, and valuation ratios;
c. describe relationships among ratios and evaluate a company using ratio analysis;
d. demonstrate the application of DuPont analysis of return on equity and calculate and interpret effects of changes in its components;
e. calculate and interpret ratios used in equity analysis and credit analysis;
f. explain the requirements for segment reporting and calculate and interpret segment ratios;
g. describe how ratio analysis and other techniques can be used to model and forecast earnings.
33 a. distinguish between financial reporting quality and quality of reported results (including quality of earnings, cash flow, and balance sheet items);
b. describe a spectrum for assessing financial reporting quality;

c. distinguish between conservative and aggressive accounting;
d. describe motivations that might cause management to issue financial reports that are not high quality;
e. describe conditions that are conducive to issuing low-quality, or even fraudulent, financial reports;
f. describe mechanisms that discipline financial reporting quality and the potential limitations of those mechanisms;
g. describe presentation choices, including non-GAAP measures, that could be used to influence an analyst's opinion;
h. describe accounting methods (choices and estimates) that could be used to manage earnings, cash flow, and balance sheet items;
i. describe accounting warning signs and methods for detecting manipulation of information in financial reports.
34 a. evaluate a company's past financial performance and explain how a company's strategy is reflected in past financial performance;
b. forecast a company's future net income and cash flow;
c. describe the role of financial statement analysis in assessing the credit quality of a potential debt investment;

	d. describe the use of financial statement analysis in screening for potential equity investments;
	e. explain appropriate analyst adjustments to a company's financial statements to facilitate comparison with another company.
j. understand specific market structures for the type investment products offered or recommended to clients and where relevant their trading venues or the existence of any secondary markets;	46 a. explain the main functions of the financial system;
	b. describe classifications of assets and markets;
	c. describe the major types of securities, currencies, contracts, commodities, and real assets that trade in organized markets, including their distinguishing characteristics and major subtypes;
	d. describe types of financial intermediaries and services that they provide;
	e. compare positions an investor can take in an asset;
	f. calculate and interpret the leverage ratio, the rate of return on a margin transaction, and the security price at which the investor would receive a margin call;
	g. compare execution, validity, and clearing instructions;
	h. compare market orders with limit orders;
	i. define primary and secondary markets and explain how secondary markets support primary markets;

j. describe how securities, contracts, and currencies are traded in quote-driven, order-driven, and brokered markets;
k. describe characteristics of a well-functioning financial system;
l. describe objectives of market regulation.
47 a. describe a security market index;
b. calculate and interpret the value, price return, and total return of an index;
c. describe the choices and issues in index construction and management;
d. compare the different weighting methods used in index construction;
e. calculate and analyze the value and return of an index given its weighting method;
f. describe rebalancing and reconstitution of an index;
g. describe uses of security market indices;
h. describe types of equity indices;
i. describe types of fixed-income indices;
j. describe indices representing alternative investments;
k. compare types of security market indices.
48 a. describe market efficiency and related concepts, including their importance to investment practitioners;

	b. distinguish between market value and intrinsic value;
	c. explain factors that affect a market's efficiency;
	d. contrast weak-form, semi-strong-form, and strong-form market efficiency;
	e. explain the implications of each form of market efficiency for fundamental analysis, technical analysis, and the choice between active and passive portfolio management;
	f. describe market anomalies;
	g. describe behavioral finance and its potential relevance to understanding market anomalies.
k. have a basic knowledge of valuation principles for the type of investment products offered or recommended to clients;	50 a. explain uses of industry analysis and the relation of industry analysis to company analysis;
	b. compare methods by which companies can be grouped, current industry classification systems, and classify a company, given a description of its activities and the classification system;
	c. explain the factors that affect the sensitivity of a company to the business cycle and the uses and limitations of industry and company descriptors such as "growth," "defensive," and "cyclical";
	d. explain how a company's industry classification can be used to identify a potential "peer group" for equity valuation;

e. describe the elements that need to be covered in a thorough industry analysis;
f. describe the principles of strategic analysis of an industry;
g. explain the effects of barriers to entry, industry concentration, industry capacity, and market share stability on pricing power and price competition;
h. describe industry life cycle models, classify an industry as to life cycle stage, and describe limitations of the life-cycle concept in forecasting industry performance;
i. compare characteristics of representative industries from the various economic sectors;
j. describe macroeconomic, technological, demographic, governmental, and social influences on industry growth, profitability, and risk;
k. describe the elements that should be covered in a thorough company analysis.
51 a. evaluate whether a security, given its current market price and a value estimate, is overvalued, fairly valued, or undervalued by the market;
b. describe major categories of equity valuation models;
c. explain the rationale for using present value models to value equity and describe the dividend discount and free-cash-flow-to-equity models;

d. calculate the intrinsic value of a non-callable, non-convertible preferred stock;
e. calculate and interpret the intrinsic value of an equity security based on the Gordon (constant) growth dividend discount model or a two-stage dividend discount model, as appropriate;
f. identify characteristics of companies for which the constant growth or a multistage dividend discount model is appropriate;
g. explain the rationale for using price multiples to value equity, how the price to earnings multiple relates to fundamentals, and the use of multiples based on comparables;
h. calculate and interpret the following multiples: price to earnings, price to an estimate of operating cash flow, price to sales, and price to book value;
i. describe enterprise value multiples and their use in estimating equity value;
j. describe asset-based valuation models and their use in estimating equity value;
k. explain advantages and disadvantages of each category of valuation model.
54 a. calculate a bond's price given a market discount rate;
b. identify the relationships among a bond's price, coupon rate, maturity, and market discount rate (yield-to-maturity);

c. define spot rates and calculate the price of a bond using spot rates;
d. describe and calculate the flat price, accrued interest, and the full price of a bond;
e. describe matrix pricing;
f. calculate and interpret yield measures for fixed-rate bonds, floating-rate notes, and money market instruments;
g. define and compare the spot curve, yield curve on coupon bonds, par curve, and forward curve;
h. define forward rates and calculate spot rates from forward rates, forward rates from spot rates, and the price of a bond using forward rates;
i. compare, calculate, and interpret yield spread measures.
59 a. explain how the concepts of arbitrage, replication, and risk neutrality are used in pricing derivatives;
b. distinguish between value and price of forward and futures contracts;
c. explain how the value and price of a forward contract are determined at expiration, during the life of the contract, and at initiation;
d. describe monetary and nonmonetary benefits and costs associated with holding the underlying asset and explain how they affect the value and price of a forward contract;

	e. define a forward rate agreement and describe its uses;
	f. explain why forward and futures prices differ;
	g. explain how swap contracts are similar to but different from a series of forward contracts;
	h. distinguish between the value and price of swaps;
	i. explain how the value of a European option is determined at expiration;
	j. explain the exercise value, time value, and moneyness of an option;
	k. identify the factors that determine the value of an option and explain how each factor affects the value of an option;
	l. explain put–call parity for European options;
	m. explain put–call–forward parity for European options;
	n. explain how the value of an option is determined using a one-period binomial model;
	o. explain under which circumstances the values of European and American options differ.
l. understand the fundamentals of managing a portfolio, including being able to understand the implications of diversification regarding individual investment alternatives.	41 a. describe the portfolio approach to investing;
	b. describe types of investors and distinctive characteristics and needs of each;

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c. describe defined contribution and defined benefit pension plans;
d. describe the steps in the portfolio management process;
e. describe mutual funds and compare them with other pooled investment products.
42 a. define risk management;
b. describe features of a risk management framework;
c. define risk governance and describe elements of effective risk governance;
d. explain how risk tolerance affects risk management;
e. describe risk budgeting and its role in risk governance;
f. identify financial and non-financial sources of risk and describe how they may interact;
g. describe methods for measuring and modifying risk exposures and factors to consider in choosing among the methods.
43 a. calculate and interpret major return measures and describe their appropriate uses;
b. describe characteristics of the major asset classes that investors consider in forming portfolios;
c. calculate and interpret the mean, variance, and covariance (or correlation) of asset returns based on historical data;

d. explain risk aversion and its implications for portfolio selection;
e. calculate and interpret portfolio standard deviation;
f. describe the effect on a portfolio's risk of investing in assets that are less than perfectly correlated;
g. describe and interpret the minimum-variance and efficient frontiers of risky assets and the global minimum-variance portfolio;
h. explain the selection of an optimal portfolio, given an investor's utility (or risk aversion) and the capital allocation line.
44 a. describe the implications of combining a risk-free asset with a portfolio of risky assets;
b. explain the capital allocation line (CAL) and the capital market line (CML);
c. explain systematic and nonsystematic risk, including why an investor should not expect to receive additional return for bearing nonsystematic risk;
d. explain return generating models (including the market model) and their uses;
e. calculate and interpret beta;
f. explain the capital asset pricing model (CAPM), including its assumptions, and the security market line (SML);

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	g. calculate and interpret the expected return of an asset using the CAPM;
	h. describe and demonstrate applications of the CAPM and the SML.
	45 a. describe the reasons for a written investment policy statement (IPS);
	b. describe the major components of an IPS;
	c. describe risk and return objectives and how they may be developed for a client;
	d. distinguish between the willingness and the ability (capacity) to take risk in analyzing an investor's financial risk tolerance;
	e. describe the investment constraints of liquidity, time horizon, tax concerns, legal and regulatory factors, and unique circumstances and their implications for the choice of portfolio assets;
	f. explain the specification of asset classes in relation to asset allocation;
	g. describe the principles of portfolio construction and the role of asset allocation in relation to the IPS.