IFMP

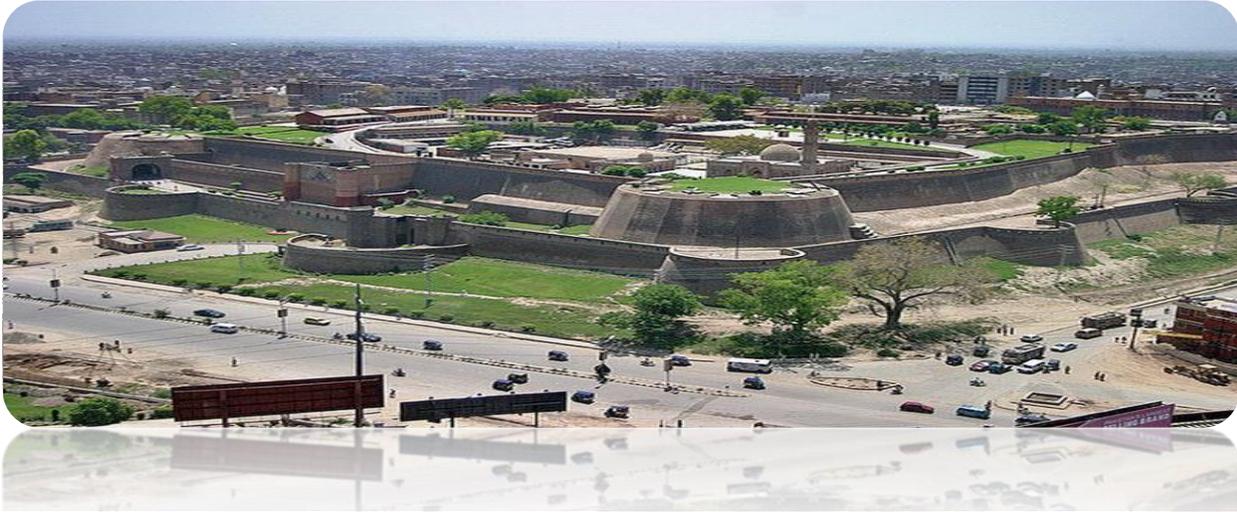**Institute of Financial Markets of Pakistan**

Financial Analysts' Certification

Level 2

Study and Reference Guide (Outline)

Element 1:

Quantitative

CORRELATION AND REGRESSION

The candidate should be able to:

1) Able to calculate and interpret a sample covariance and a sample correlation coefficient, and interpret a scatter plot.

2) Able to define a hypothesis, describe the steps of hypothesis testing, and describe and interpret the choice of the null and alternative hypotheses.

3) Able to distinguish between one-tailed and two-tailed tests of hypotheses.

4) Able to explain a test statistic, Type I and Type II errors, a significance level, and how significance levels are used in hypothesis testing.

5) Able to explain a decision rule, the power of a test, and the relation between confidence intervals and hypothesis tests.

6) Able to distinguish between a statistical result and an economically meaningful result.

7) Able to explain and interpret the p-value as it relates to hypothesis testing.

8) Able to identify the appropriate test statistic and interpret the results for a hypothesis test concerning the population mean of both large and small samples when the population is normally or approximately normally distributed and the variance is 1) known or 2) unknown.

9) Able to identify the appropriate test statistic and interpret the results for a hypothesis test concerning the equality of the population means of two at least approximately normally distributed populations, based on independent random samples with 1) equal or 2) unequal assumed variances.

10) Able to identify the appropriate test statistic and interpret the results for a hypothesis test concerning the mean difference of two normally distributed populations.

11) Able to identify the appropriate test statistic and interpret the results for a hypothesis test concerning 1) the variance of a normally distributed population, and 2) the equality of the variances of two normally distributed populations based on two independent random samples.

12) Able to distinguish between parametric and nonparametric tests and describe situations in which the use of nonparametric tests may be appropriate.

13) Understand limitations to correlation analysis.

14) Able to formulate a test of the hypothesis that the population correlation coefficient equals zero, and determine whether the hypothesis is rejected at a given level of significance.

15) Understand the difference between dependent and independent variables in a linear regression

16) Know the assumptions underlying linear regression, and interpret regression coefficients.

17) Able to calculate and interpret the standard error of estimate, the coefficient of determination, and a confidence interval for a regression coefficient.

18) Formulate a null and alternative hypothesis about a population value of a regression coefficient, and determine the appropriate test statistic and whether the null hypothesis is rejected at a given level of significance.

19) Able to calculate the predicted value for the dependent variable, given an estimated regression model and a value for the independent variable.

20) Able to calculate and interpret a confidence interval for the predicted value of the dependent variable.

21) Understand the use of analysis of variance (ANOVA) in regression analysis, interpret ANOVA results, and calculate and interpret the F-statistic.

22) Know the limitations of regression analysis.

23) Formulate a multiple regression equation to describe the relation between a dependent variable and several independent variables.

24) Interpret estimated regression coefficients and their p-values.

25) Formulate a null and an alternative hypothesis about the population value of a regression coefficient, calculate the value of the test statistic, and determine whether to reject the null hypothesis at a given level of significance.

26) Able to calculate and interpret 1) a confidence interval for the population value of a regression coefficient and 2) a predicted value for the dependent variable, given an estimated regression model and assumed values for the independent variables.

27) Know the assumptions of a multiple regression model.

28) Able to calculate and interpret the F-statistic, and describe how it is used in regression analysis.

29) Understand the difference between and interpret the R2 and adjusted R2 in multiple regression.

30) Evaluate how well a regression model explains the dependent variable by analyzing the output of the regression equation and an ANOVA table.

31) Formulate a multiple regression equation by using dummy variables to represent qualitative factors, and interpret the coefficients and regression results.

32) Able to explain the types of heteroskedasticity and how heteroskedasticity and serial correlation affect statistical inference

33) Understand multicollinearity, and explain its causes and effects in regression analysis.

34) Able to describe how model misspecification affects the results of a regression analysis, and describe how to avoid common forms of misspecification.

35) Understand models with qualitative dependent variables

36) Evaluate and interpret a multiple regression model and its results.

37) Able to calculate and evaluate the predicted trend value for a time series, modelled as either a linear trend or a log-linear trend, given the estimated trend coefficients.

38) Understand the factors that determine whether a linear or a log-linear trend should be used with a particular time series, and evaluate limitations of trend models.

39) Understand the requirement for a time series to be covariance stationary, and describe the significance of a series that is not stationary.

40) Understand the structure of an autoregressive (AR) model of order p, and calculate one- and two-period ahead forecasts given the estimated coefficients

41) Able to contrast in-sample and out-of-sample forecasts, and compare the forecasting accuracy of different time-series models based on the root mean squared error criterion.

42) Understand the instability of coefficients of time-series models.

43) Understand the characteristics of random walk processes, and contrast them to covariance stationary processes.

44) Know how to test and correct for seasonality in a time-series model, and calculate and interpret a forecasted value using an AR model with a seasonal lag.

45) Understand autoregressive conditional heteroskedasticity (ARCH), and describe how ARCH models can be applied to predict the variance of a time series.

46) Know how time-series variables should be analysed for nonstationarity and/or cointegration before use in a linear regression.

47) Determine an appropriate time-series model to analyze a given investment problem, and justify that choice.

48) Know the simulations and assessment of probabilistic risk

Element 2:

Economics

CURRENCY EXCHANGE RATES: DETERMINATION AND FORECASTING:-

The candidate should be able to:

a) Calculate and interpret the bid–ask spread on a spot or forward foreign currency quotation and describe the factors that affect the bid–offer spread

b) Identify a triangular arbitrage opportunity and calculate its profit, given the bid–offer quotations for three currencies

c) Distinguish between spot and forward rates and calculate the forward premium/discount for a given currency

d) Calculate the mark-to-market value of a forward contract

e) Explain international parity relations (covered and uncovered interest rate parity, purchasing power parity, and the international Fisher effect)

f) Describe relations among the international parity conditions

g) Evaluate the use of the current spot rate, the forward rate, purchasing power parity, and uncovered interest parity to forecast future spot exchange rates

h) Explain approaches to assessing the long-run fair value of an exchange rate

i) Describe the carry trade and its relation to uncovered interest rate parity and calculate the profit from a carry trade

j) Explain how flows in the balance of payment accounts affect currency exchange rates

k) Describe the Mundell–Fleming model, the monetary approach, and the asset market (portfolio balance) approach to exchange rate determination

l) Forecast the direction of the expected change in an exchange rate based on balance of payment, Mundell–Fleming, monetary, and asset market approaches to exchange rate determination

m) Explain the potential effects of monetary and fiscal policy on exchange rates

n) Describe objectives of central bank intervention and capital controls and describe the effectiveness of intervention and capital controls

o) Describe warning signs of a currency crisis

p) Describe uses of technical analysis in forecasting exchange rates

ECONOMIC GROWTH AND THE INVESTMENT DECISION:-

The candidate should be able to:

a) Compare factors favoring and limiting economic growth in developed and developing economies

b) Describe the relation between the long-run rate of stock market appreciation and the sustainable growth rate of the economy

c) Explain why potential GDP and its growth rate matter for equity and fixed income investors

d) Distinguish between capital deepening investment and technological progress and explain how each affects economic growth and labor productivity

e) Forecast potential GDP based on growth accounting relations

f) Explain how natural resources affect economic growth and evaluate the argument that limited availability of natural resources constrains economic growth

g) Explain how demographics, immigration, and labor force participation affect the rate and sustainability of economic growth

h) Explain how investment in physical capital, human capital, and technological development affects economic growth

i) Compare classical growth theory, neoclassical growth theory, and endogenous growth theory

j) Explain and evaluate convergence hypotheses

k) Describe the economic rationale for governments to provide incentives to private investment in technology and knowledge

l) Describe the expected impact of removing trade barriers on capital investment and profits, employment and wages, and growth in the economies involved

ECONOMICS OF REGULATION:-

The candidate should be able to:

a) Describe classifications of regulations and regulators

b) Describe uses of self-regulation in financial markets

c) Describe the economic rationale for regulatory intervention

d) Describe regulatory interdependencies and their effects

e) Describe tools of regulatory intervention in markets

f) Explain purposes in regulating commerce and financial markets

g) Describe anticompetitive behaviors targeted by antitrust laws globally and evaluate the antitrust risk associated with a given business strategy

h) Describe benefits and costs of regulation

i) Evaluate how a specific regulation affects an industry, company, or security

Element 3:

Financial Reporting

INTERCORPORATE INVESTMENTS:-

The candidate should be able to:

a) Describe the classification, measurement, and disclosure under International Financial Reporting Standards (IFRS) for 1) investments in financial assets, 2) investments in associates, 3) joint ventures, 4) business combinations, and 5) special purpose and variable interest entities
b) Distinguish between IFRS and US GAAP in the classification, measurement, and disclosure of investments in financial assets, investments in associates, joint ventures, business combinations, and special purpose and variable interest entities
c) Analyze how different methods used to account for intercorporate investments affect financial statements and ratios

EMPLOYEE COMPENSATION: POST-EMPLOYMENT AND SHARE-BASED:-

The candidate should be able to:

a) Describe the types of post-employment benefit plans and implications for financial reports
b) Explain and calculate measures of a defined benefit pension obligation (i.e., present value of the defined benefit obligation and projected benefit obligation) and net pension liability (or asset)
c) Describe the components of a company's defined benefit pension costs
d) Explain and calculate the effect of a defined benefit plan's assumptions on the defined benefit obligation and periodic pension cost
e) Explain and calculate how adjusting for items of pension and other postemployment benefits that are reported in the notes to the financial statements affects financial statements and ratios
f) Interpret pension plan note disclosures including cash flow related information
g) Explain issues associated with accounting for share-based compensation
h) Explain how accounting for stock grants and stock options affects financial statements, and the importance of companies' assumptions in valuing these grants and options

MULTINATIONAL OPERATIONS:-

The candidate should be able to:

a) Distinguish among presentation (reporting) currency, functional currency, and local currency
b) Describe foreign currency transaction exposure, including accounting for and disclosures about foreign currency transaction gains and losses
c) Analyze how changes in exchange rates affect the translated sales of the subsidiary and parent company
d) Compare the current rate method and the temporal method, evaluate how each affects the parent company's balance sheet and income statement, and determine which method is appropriate in various scenarios

e) Calculate the translation effects and evaluate the translation of a subsidiary's balance sheet and income statement into the parent company's presentation currency

f) Analyze how the current rate method and the temporal method affect financial statements and ratios

g) Analyze how alternative translation methods for subsidiaries operating in hyperinflationary economies affect financial statements and ratios

h) Describe how multinational operations affect a company's effective tax rate

i) Explain how changes in the components of sales affect the sustainability of sales growth

j) Analyze how currency fluctuations potentially affect financial results, given a company's countries of operation

EVALUATING QUALITY OF FINANCIAL REPORTS:-

The candidate should be able to:

a) Demonstrate the use of a conceptual framework for assessing the quality of a company's financial reports

b) Explain potential problems that affect the quality of financial reports

c) Describe how to evaluate the quality of a company's financial reports

d) Evaluate the quality of a company's financial reports

e) Describe the concept of sustainable (persistent) earnings

f) Describe indicators of earnings quality

g) Explain mean reversion in earnings and how the accruals component of earnings affects the speed of mean reversion

h) Evaluate the earnings quality of a company

i) Describe indicators of cash flow quality

j) Evaluate the cash flow quality of a company

k) Describe indicators of balance sheet quality

l) Evaluate the balance sheet quality of a company

m) Describe sources of information about risk

INTEGRATION OF FINANCIAL STATEMENT ANALYSIS TECHNIQUES:-

The candidate should be able to:

a) Demonstrate the use of a framework for the analysis of financial statements, given a particular problem, question, or purpose (e.g., valuing equity based on comparables, critiquing a credit rating, obtaining a comprehensive picture of financial leverage, evaluating the perspectives given in management's discussion of financial results)

b) Identify financial reporting choices and biases that affect the quality and comparability of companies' financial statements, and explain how such biases may affect financial decisions

c) Evaluate the quality of a company's financial data, and recommend appropriate adjustments to improve quality and comparability with similar companies, including adjustments for differences in accounting standards, methods, and assumptions

d) Evaluate how a given change in accounting standards, methods, or assumptions affects financial statements and ratios

e) Analyze and interpret how balance sheet modifications, earnings normalization, and cash flow statement related modifications affect a company's financial statements, financial ratios, and overall financial condition

Element 4:

Corporate Finance

CAPITAL BUDGETING
The candidate should be able to:
a) Calculate the yearly cash flows of expansion and replacement capital projects and evaluate how the choice of depreciation method affects those cash flows
b) Explain how inflation affects capital budgeting analysis
c) Evaluate capital projects and determine the optimal capital project in situations of 1) mutually exclusive projects with unequal lives, using either the least common multiple of lives approach or the equivalent annual annuity approach, and 2) capital rationing
d) Explain how sensitivity analysis, scenario analysis, and Monte Carlo simulation can be used to assess the stand-alone risk of a capital project
e) Explain and calculate the discount rate, based on market risk methods, to use in valuing a capital project
f) Describe types of real options and evaluate a capital project using real options
g) Describe common capital budgeting pitfalls
h) Calculate and interpret accounting income and economic income in the context of capital budgeting
i) Distinguish among the economic profit, residual income, and claims valuation models for capital budgeting and evaluate a capital project using each

CAPITAL STRUCTURE
The candidate should be able to:
a) Explain the Modigliani–Miller propositions regarding capital structure, including the effects of leverage, taxes, financial distress, agency costs, and asymmetric information on a company's cost of equity, cost of capital, and optimal capital structure
b) Describe target capital structure and explain why a company's actual capital structure may fluctuate around its target
c) Describe the role of debt ratings in capital structure policy
d) Explain factors an analyst should consider in evaluating the effect of capital structure policy on valuation
e) Describe international differences in the use of financial leverage, factors that explain these differences, and implications of these differences for investment analysis

DIVIDENDS AND SHARE REPURCHASES: ANALYSIS
The candidate should be able to:
a) Compare theories of dividend policy and explain implications of each for share value given a description of a corporate dividend action

b) Describe types of information (signals) that dividend initiations, increases, decreases, and omissions may convey

c) Explain how clientele effects and agency issues may affect a company's payout policy

d) Explain factors that affect dividend policy

e) Calculate and interpret the effective tax rate on a given currency unit of corporate earnings under double taxation, dividend imputation, and split-rate tax systems

f) Compare stable dividend, constant dividend payout ratio, and residual dividend payout policies, and calculate the dividend under each policy

g) Explain the choice between paying cash dividends and repurchasing shares

h) Describe broad trends in corporate dividend policies

i) Calculate and interpret dividend coverage ratios based on 1) net income and 2) free cash flow

j) Identify characteristics of companies that may not be able to sustain their cash dividend

CORPORATE PERFORMANCE, GOVERNANCE, AND BUSINESS ETHICS
The candidate should be able to:

a) Compare interests of key stakeholder groups and explain the purpose of a stakeholder impact analysis

b) Discuss problems that can arise in principal–agent relationships and mechanisms that may mitigate such problems

c) Discuss roots of unethical behavior and how managers might ensure that ethical issues are considered in business decision making

d) Compare the Friedman doctrine, Utilitarianism, Kantian Ethics, and Rights and Justice Theories as approaches to ethical decision making

CORPORATE GOVERNANCE
The candidate should be able to:

a) Describe objectives and core attributes of an effective corporate governance system and evaluate whether a company's corporate governance has those attributes

b) Compare major business forms and describe the conflicts of interest associated with each

c) Explain conflicts that arise in agency relationships, including manager–shareholder conflicts and director–shareholder conflicts

d) Describe responsibilities of the board of directors and explain qualifications and core competencies that an investment analyst should look for in the board of directors

e) Explain effective corporate governance practice as it relates to the board of directors and evaluate strengths and weaknesses of a company's corporate governance practice

f) Describe elements of a company's statement of corporate governance policies that investment analysts should assess

g) Describe environmental, social, and governance risk exposures

h) Explain the valuation implications of corporate governance

MERGERS AND ACQUISITIONS
The candidate should be able to:

a) Classify merger and acquisition (M&A) activities based on forms of integration and relatedness of business activities

b) Explain common motivations behind M&A activity

c) Explain bootstrapping of earnings per share (EPS) and calculate a company's post-merger EPS

d) Explain, based on industry life cycles, the relation between merger motivations and types of mergers

e) Contrast merger transaction characteristics by form of acquisition, method of payment, and attitude of target management

f) Distinguish among pre-offer and post-offer takeover defense mechanisms

g) Calculate and interpret the Herfindahl–Hirschman Index and evaluate the likelihood of an antitrust challenge for a given business combination

h) Compare the discounted cash flow, comparable company, and comparable transaction analyses for valuing a target company, including the advantages and disadvantages of each

i) Calculate free cash flows for a target company and estimate the company's intrinsic value based on discounted cash flow analysis

j) Estimate the value of a target company using comparable company and comparable transaction analyses

k) Evaluate a takeover bid and calculate the estimated post-acquisition value of an acquirer and the gains accrued to the target shareholders versus the acquirer shareholders

l) Explain how price and payment method affect the distribution of risks and benefits in M&A transactions

m) Describe characteristics of M&A transactions that create value

n) Distinguish among equity carve-outs, spin-offs, split-offs, and liquidation

o) Explain common reasons for restructuring

Element 5:
Equity

EQUITY VALUATION: APPLICATIONS AND PROCESSES
The candidate should be able to:
a) Define valuation and intrinsic value and explain sources of perceived mispricing
b) Explain the going concern assumption and contrast a going concern value to a liquidation value
c) Describe definitions of value and justify which definition of value is most relevant to public company valuation
d) Describe applications of equity valuation
e) Describe questions that should be addressed in conducting an industry and competitive analysis
f) Contrast absolute and relative valuation models and describe examples of each type of model
g) Describe sum-of-the-parts valuation and conglomerate discounts
h) Explain broad criteria for choosing an appropriate approach for valuing a given company

RETURN CONCEPTS
The candidate should be able to:
a) Distinguish among realized holding period return, expected holding period return, and required return, return from convergence of price to intrinsic value, discount rate, and internal rate of return
b) Calculate and interpret an equity risk premium using historical and forward-looking estimation approaches
c) Estimate the required return on an equity investment using the capital asset pricing model, the Fama–French model, the Pastor–Stambaugh model, macroeconomic multifactor models, and the build-up method (e.g., bond yield plus risk premium)
d) Explain beta estimation for public companies, thinly traded public companies, and nonpublic companies
e) Describe strengths and weaknesses of methods used to estimate the required return on an equity investment

f) Explain international considerations in required return estimation

g) Explain and calculate the weighted average cost of capital for a company

h) Evaluate the appropriateness of using a particular rate of return as a discount rate, given a description of the cash flow to be discounted and other relevant facts

INDUSTRY AND COMPANY ANALYSIS

The candidate should be able to:

a) Compare top-down, bottom-up, and hybrid approaches for developing inputs to equity valuation models

b) Compare "growth relative to GDP growth" and "market growth and market share" approaches to forecasting revenue

c) Evaluate whether economies of scale are present in an industry by analyzing operating margins and sales levels

d) Forecast the following costs: cost of goods sold, selling general and administrative costs, financing costs, and income taxes

e) Describe approaches to balance sheet modeling

f) Describe the relationship between return on invested capital and competitive advantage

g) Explain how competitive factors affect prices and costs

h) Judge the competitive position of a company based on a Porter's five forces analysis

i) Explain how to forecast industry and company sales and costs when they are subject to price inflation or deflation

j) Evaluate the effects of technological developments on demand, selling prices, costs, and margins

k) Explain considerations in the choice of an explicit forecast horizon

l) Explain an analyst's choices in developing projections beyond the short-term forecast horizon

m) Demonstrate the development of a sales-based pro forma company model

DISCOUNTED DIVIDEND VALUATION

The candidate should be able to:

a) Compare dividends, free cash flow, and residual income as inputs to discounted cash flow models and identify investment situations for which each measure is suitable

b) Calculate and interpret the value of a common stock using the dividend discount model (DDM) for single and multiple holding periods

c) Calculate the value of a common stock using the Gordon growth model and explain the model's underlying assumptions

d) Calculate and interpret the implied growth rate of dividends using the Gordon growth model and current stock price

e) Calculate and interpret the present value of growth opportunities (PVGO) and the component of the leading price-to-earnings ratio (P/E) related to PVGO

f) Calculate and interpret the justified leading and trailing P/Es using the Gordon growth model

g) Calculate the value of non-callable fixed-rate perpetual preferred stock

h) Describe strengths and limitations of the Gordon growth model and justify its selection to value a company's common shares

i) Explain the assumptions and justify the selection of the two-stage DDM, the H-model, the three-stage DDM, or spreadsheet modeling to value a company's common shares

j) Explain the growth phase, transitional phase, and maturity phase of a business

k) Describe terminal value and explain alternative approaches to determining the terminal value in a DDM

l) Calculate and interpret the value of common shares using the two-stage DDM, the H-model, and the three-stage DDM

m) Estimate a required return based on any DDM, including the Gordon growth model and the H-model

n) Explain the use of spreadsheet modeling to forecast dividends and to value common shares

o) Calculate and interpret the sustainable growth rate of a company and demonstrate the use of DuPont analysis to estimate a company's sustainable growth rate

p) Evaluate whether a stock is overvalued, fairly valued, or undervalued by the market based on a DDM estimate of value

FREE CASH FLOW VALUATION
The candidate should be able to:

a) Compare the free cash flow to the firm (FCFF) and free cash flow to equity (FCFE) approaches to valuation

b) Explain the ownership perspective implicit in the FCFE approach

c) Explain the appropriate adjustments to net income, earnings before interest and taxes (EBIT), earnings before interest, taxes, depreciation, and amortization (EBITDA), and cash flow from operations (CFO) to calculate FCFF and FCFE

d) Calculate FCFF and FCFE

e) Describe approaches for forecasting FCFF and FCFE

f) Compare the FCFE model and dividend discount models

g) Explain how dividends, share repurchases, share issues, and changes in leverage may affect future FCFF and FCFE

h) Evaluate the use of net income and EBITDA as proxies for cash flow in valuation

i) Explain the single-stage (stable-growth), two-stage, and three-stage FCFF and FCFE models and select and justify the appropriate model given a company's characteristics

j) Estimate a company's value using the appropriate free cash flow model(s)

k) Explain the use of sensitivity analysis in FCFF and FCFE valuations

l) Describe approaches for calculating the terminal value in a multistage valuation model

m) Evaluate whether a stock is overvalued, fairly valued, or undervalued based on a free cash flow valuation model

MARKET-BASED VALUATION: PRICE AND ENTERPRISE VALUE MULTIPLES
The candidate should be able to:

a) Distinguish between the method of comparables and the method based on forecasted fundamentals as approaches to using price multiples in valuation, and explain economic rationales for each approach

b) Calculate and interpret a justified price multiple

c) Describe rationales for and possible drawbacks to using alternative price multiples and dividend yield in valuation

d) Calculate and interpret alternative price multiples and dividend yield

e) Calculate and interpret underlying earnings, explain methods of normalizing earnings per share (EPS), and calculate normalized EPS

f) Explain and justify the use of earnings yield (E/P)

g) Describe fundamental factors that influence alternative price multiples and dividend yield

h) Calculate and interpret the justified price-to-earnings ratio (P/E), price-to-book ratio (P/B), and price-to-sales ratio (P/S) for a stock, based on forecasted fundamentals

i) Calculate and interpret a predicted P/E, given a cross-sectional regression on fundamentals, and explain limitations to the cross-sectional regression methodology

j) Evaluate a stock by the method of comparables and explain the importance of fundamentals in using the method of comparables

k) Calculate and interpret the P/E-to-growth ratio (PEG) and explain its use in relative valuation

l) Calculate and explain the use of price multiples in determining terminal value in a multistage discounted cash flow (DCF) model

m) Explain alternative definitions of cash flow used in price and enterprise value (EV) multiples and describe limitations of each definition

n) Calculate and interpret EV multiples and evaluate the use of EV/EBITDA

o) Explain sources of differences in cross-border valuation comparisons

p) Describe momentum indicators and their use in valuation

q) Explain the use of the arithmetic mean, the harmonic mean, the weighted harmonic mean, and the median to describe the central tendency of a group of multiples

r) Evaluate whether a stock is overvalued, fairly valued, or undervalued based on comparisons of multiples

RESIDUAL INCOME VALUATION

The candidate should be able to:

a) Calculate and interpret residual income, economic value added, and market value added

b) Describe the uses of residual income models

c) Calculate the intrinsic value of a common stock using the residual income model and compare value recognition in residual income and other present value models

d) Explain fundamental determinants of residual income

e) Explain the relation between residual income valuation and the justified price-to-book ratio based on forecasted fundamentals

f) Calculate and interpret the intrinsic value of a common stock using single-stage (constant-growth) and multistage residual income models

g) Calculate the implied growth rate in residual income, given the market price-to-book ratio and an estimate of the required rate of return on equity

h) Explain continuing residual income and justify an estimate of continuing residual income at the forecast horizon, given company and industry prospects

i) Compare residual income models to dividend discount and free cash flow models

j) Explain strengths and weaknesses of residual income models and justify the selection of a residual income model to value a company's common stock

k) Describe accounting issues in applying residual income models

l) Evaluate whether a stock is overvalued, fairly valued, or undervalued based on a residual income model

PRIVATE COMPANY VALUATION

The candidate should be able to:

a) Compare public and private company valuation

b) Describe uses of private business valuation and explain applications of greatest concern to financial analysts

c) Explain various definitions of value and demonstrate how different definitions can lead to different estimates of value

d) Explain the income, market, and asset-based approaches to private company valuation and factors relevant to the selection of each approach

e) Explain cash flow estimation issues related to private companies and adjustments required to estimate normalized earnings

f) Calculate the value of a private company using free cash flow, capitalized cash flow, and/or excess earnings methods

g) Explain factors that require adjustment when estimating the discount rate for private companies

h) Compare models used to estimate the required rate of return to private company equity (for example, the CAPM, the expanded CAPM, and the build-up approach)

i) Calculate the value of a private company based on market approach methods and describe advantages and disadvantages of each method

j) Describe the asset-based approach to private company valuation

k) Explain and evaluate the effects on private company valuations of discounts and premiums based on control and marketability

l) Describe the role of valuation standards in valuing private companies.

Element 6:

Fixed Income

THE TERM STRUCTURE AND INTEREST RATE DYNAMICS

The candidate should be able to:

a) Describe relationships among spot rates, forward rates, yield to maturity, expected and realized returns on bonds, and the shape of the yield curve

b) Describe the forward pricing and forward rate models and calculate forward and spot prices and rates using those models

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

d) Describe the assumptions concerning the evolution of spot rates in relation to forward rates implicit in active bond portfolio management

e) Describe the strategy of riding the yield curve

f) Explain the swap rate curve and why and how market participants use it in valuation

g) Calculate and interpret the swap spread for a given maturity

h) Describe the Z-spread

i) Describe the TED and Libor–OIS spreads

j) 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

k) Describe modern term structure models and how they are used

l) 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

m) Explain the maturity structure of yield volatilities and their effect on price volatility

THE ARBITRAGE-FREE VALUATION FRAMEWORK

The candidate should be able to:

a) Explain what is meant by arbitrage-free valuation of a fixed-income instrument

b) Calculate the arbitrage-free value of an option-free, fixed-rate coupon bond

c) Describe a binomial interest rate tree framework

d) Describe the backward induction valuation methodology and calculate the value of a fixed-income instrument given its cash flow at each node

e) Describe the process of calibrating a binomial interest rate tree to match a specific term structure

f) Compare pricing using the zero-coupon yield curve with pricing using an arbitrage-free binomial lattice

g) 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

h) Describe a Monte Carlo forward-rate simulation and its application

VALUATION AND ANALYSIS: BONDS WITH EMBEDDED OPTIONS

The candidate should be able to:

a) Describe fixed-income securities with embedded options

b) Explain the relationships between the values of a callable or putable bond, the underlying option-free (straight) bond, and the embedded option

c) Describe how the arbitrage-free framework can be used to value a bond with embedded options

d) Explain how interest rate volatility affects the value of a callable or putable bond

e) Explain how changes in the level and shape of the yield curve affect the value of a callable or putable bond

f) Calculate the value of a callable or putable bond from an interest rate tree

g) Explain the calculation and use of option-adjusted spreads

h) Explain how interest rate volatility affects option-adjusted spreads

i) Calculate and interpret effective duration of a callable or putable bond

j) Compare effective durations of callable, putable, and straight bonds

k) Describe the use of one-sided durations and key rate durations to evaluate the interest rate sensitivity of bonds with embedded options

l) Compare effective convexities of callable, putable, and straight bonds

m) Describe defining features of a convertible bond

n) Calculate and interpret the components of a convertible bond's value

o) Describe how a convertible bond is valued in an arbitrage-free framework

p) 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:

a) Explain probability of default, loss given default, expected loss, and present value of the expected loss and describe the relative importance of each across the credit spectrum

b) Explain credit scoring and credit ratings, including why they are called ordinal rankings

c) Explain strengths and weaknesses of credit ratings

d) Explain structural models of corporate credit risk, including why equity can be viewed as a call option on the company's assets

e) Explain reduced form models of corporate credit risk, including why debt can be valued as the sum of expected discounted cash flows after adjusting for risk

f) Explain assumptions, strengths, and weaknesses of both structural and reduced form models of corporate credit risk

g) Explain the determinants of the term structure of credit spreads

h) Calculate and interpret the present value of the expected loss on a bond over a given time horizon

i) Compare the credit analysis required for asset-backed securities to analysis of corporate debt

Element 7:
Derivatives

CREDIT DEFAULT SWAPS

The candidate should be able to:

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

PRICING AND VALUATION OF FORWARD COMMITMENTS

The candidate should be able to:

a) Describe and compare how equity, interest rate, fixed-income, and currency forward and futures contracts are priced and valued.
b) Calculate and interpret the no-arbitrage value of equity, interest rate, fixed-income, and currency forward and futures contracts.
c) Describe and compare how interest rate, currency, and equity swaps are priced and valued.
d) Calculate and interpret the no-arbitrage value of interest rate, currency, and equity swaps.

VALUATION OF CONTINGENT CLAIMS

The candidate should be able to:

a) Describe and interpret the binomial option valuation model and its component terms.
b) Calculate the no-arbitrage values of European and American options using a twoperiod binomial model
c) Describe how the value of a European option can be analyzed as the present value of the option's expected payoff at expiration
d) Identify an arbitrage opportunity involving options and describe the related arbitrage.
e) Describe how interest rate options are valued using a two-period binomial model.
f) Calculate and interpret the values of an interest rate option using a two-period binomial model.
g) Identify assumptions of the Black–Scholes–Merton option valuation model.
h) Interpret the components of the Black–Scholes–Merton model as applied to call options in terms of a leveraged position in the underlying
i) Describe how the Black–Scholes–Merton model is used to value European options on equities and currencies.
j) Describe how the Black model is used to value European interest rate options and European swaptions.

k) Describe how the Black model is used to value European interest rate options and European swaptions.
l) Interpret each of the option Greeks.
m) Describe how a delta hedge is executed.
n) Describe the role of gamma risk in options trading
o) Define implied volatility and explain how it is used in options trading

DERIVATIVES STRATEGIES

The candidate should be able to:
a) Describe how interest rate, currency, and equity swaps, futures, and forwards can be used to modify risk and return.
b) Describe how to replicate an asset by using options and by using cash plus forwards or futures.
c) Describe the investment objectives, structure, payoff, and risk(s) of a covered call position.
d) Describe the investment options, structure, payoff, and risk(s) of a protective put position.
e) Calculate and interpret the value at expiration, profit, maximum profit, maximum loss, and breakeven underlying price at expiration for covered calls and protective puts.
f) Contrast protective put and covered call positions to being long an asset and short a forward on the asset.
g) Describe the investment objective(s), structure, payoffs, and risk of the following option strategies: bull spread, bear spread, collar, and straddle.
h) Calculate and interpret the value at expiration, profit, maximum profit, maximum loss, and breakeven underlying price at expiration of the following option strategies: bull spread, bear spread, collar, and straddle.
i) Describe uses of calendar spreads
j) Identify and evaluate appropriate derivatives strategies consistent with given investment objectives.

Element 8:
Portfolio Management

The candidate should know:

PORTFOLIO MANAGEMENT: AN OVERVIEW

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.

RISK MANAGEMENT: AN INTRODUCTION

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.

PORTFOLIO RISK AND RETURN: PART I

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.

PORTFOLIO RISK AND RETURN: PART II

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).

g) Calculate and interpret the expected return of an asset using the CAPM.

h) Describe and demonstrate applications of the CAPM and the SML.

i) Calculate and interpret the Sharpe ratio, Treynor ratio, M2, and Jensen's alpha.

BASICS OF PORTFOLIO PLANNING AND CONSTRUCTION

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.

AN INTRODUCTION TO MULTIFACTOR MODELS

The candidate should be able to:

a) Describe arbitrage pricing theory (APT), including its underlying assumptions and its relation to multifactor models
b) Define arbitrage opportunity and determine whether an arbitrage opportunity exists
c) Calculate the expected return on an asset given an asset's factor sensitivities and the factor risk premiums
d) Describe and compare macroeconomic factor models, fundamental factor models, and statistical factor models
e) Explain sources of active risk and interpret tracking risk and the information ratio
f) Describe uses of multifactor models and interpret the output of analyses based on multifactor models
g) Describe the potential benefits for investors in considering multiple risk dimensions when modeling asset returns

ANALYSIS OF ACTIVE PORTFOLIO MANAGEMENT

The candidate should be able to:

a) Describe how value added by active management is measured
b) Calculate and interpret the information ratio (ex post and ex ante) and contrast it to the Sharpe ratio
c) State and interpret the fundamental law of active portfolio management including its component terms—transfer coefficient, information coefficient, breadth, and active risk (aggressiveness)
d) Explain how the information ratio may be useful in investment manager selection and choosing the level of active portfolio risk
e) Compare active management strategies (including market timing and security selection) and evaluate strategy changes in terms of the fundamental law of active management
f) Describe the practical strengths and limitations of the fundamental law of active management

ECONOMICS AND INVESTMENT MARKETS

The candidate should be able to:

a) Explain the notion that to affect market values, economic factors must affect one or more of the following: (1) default-free interest rates across maturities, (2) the timing and/or magnitude of expected cash flows, and (3) risk premiums
b) Explain the role of expectations and changes in expectations in market valuation
c) Explain the relationship between the long-term growth rate of the economy, the volatility of the growth rate, and the average level of real short-term interest rates
d) Explain how the phase of the business cycle affects policy and short-term interest rates, the slope of the term structure of interest rates, and the relative performance of bonds of differing maturities
e) Describe the factors that affect yield spreads between non-inflation-adjusted and inflation-indexed bonds
f) Explain how the phase of the business cycle affects credit spreads and the performance of credit-sensitive fixed-income instruments
g) Explain how the characteristics of the markets for a company's products affect the company's credit quality

h) Explain how the phase of the business cycle affects short-term and long-term earnings growth expectations

i) Explain the relationship between the consumption-hedging properties of equity and the equity risk premium

j) Describe cyclical effects on valuation multiples

k) Describe the implications of the business cycle for a given style strategy (value, growth, small capitalization, large capitalization)

l) Describe how economic analysis is used in sector rotation strategies

m) Describe the economic factors affecting investment in commercial real estate

THE PORTFOLIO MANAGEMENT PROCESS AND THE INVESTMENT POLICY STATEMENT
The candidate should be able to:

a) Explain the importance of the portfolio perspective

b) Describe the steps of the portfolio management process and the components of those steps;

c) Explain the role of the investment policy statement in the portfolio management process and describe the elements of an investment policy statement

d) Explain how capital market expectations and the investment policy statement help influence the strategic asset allocation decision and how an investor's investment time horizon may influence the investor's strategic asset allocation

e) Define investment objectives and constraints and explain and distinguish among the types of investment objectives and constraints

f) Contrast the types of investment time horizons, determine the time horizon for a particular investor, and evaluate the effects of this time horizon on portfolio choice

g) Justify ethical conduct as a requirement for managing investment portfolios

MEASURING AND MANAGING MARKET RISK

a) Explain the use of value at risk (VaR) in measuring portfolio risk.

b) Compare the parametric (variance–covariance), historical simulation, and Monte Carlo simulation methods for estimating VaR.

c) Estimate and interpret VaR under the parametric, historical simulation, and Monte Carlo simulation methods.

d) Describe advantages and limitations of VaR.

e) Describe extensions of VaR.

f) Describe sensitivity risk measures and scenario risk measures and compare these measures to VaR.

g) Demonstrate how equity, fixed income, and options exposure measures may be used in measuring and managing market risk and volatility risk.

h) Describe the use of sensitivity risk measures and scenario risk measures.

i) Describe advantages and limitations of sensitivity risk measures and scenario risk measures.

j) Describe risk measures used by banks, asset managers, pension funds, and insurers.

k) Explain constraints used in managing market risks, including risk budgeting, position limits, scenario limits, and stop-loss limits.

l) Explain how risk measures may be used in capital allocation decisions.

ALGORITHMIC TRADING AND HIGH-FREQUENCY TRADING

a) Define algorithmic trading.

b) Distinguish between execution algorithms and high-frequency trading algorithms.

c) Describe types of execution algorithms and high-frequency trading algorithms.
d) Describe market fragmentation and its effects on how trades are placed.
e) Describe the use of technology in risk management and regulatory oversight.
f) Describe issues and concerns related to the impact of algorithmic and high-frequency trading on securities markets.