1. Ethics

Case 1: Sobhani（考点：Code and standards）

1. Solution: C.

The information disclosed about the exams by either Sobhani or Miyagawa is not confidential CFA Program information so they are not in violation of Standard VII. Sobhani's information was based upon his analysis of the readings and is his opinion, and Miyagawa referenced the practice exam, which does not reflect content in the actual CFA exam.

2. Solution: C.

The market environment forecast is stated as an opinion, not fact, and as such is not a violation of Standard V (B)-Communication with Clients and Prospective Clients. But, Sobhani's asset allocation recommendation, a 60% equity allocation is risky and does not relate to the long-term objectives and circumstances of Poundston, so, is in violation of Standard III(C)-Suitability. A high equity allocation for a sick and elderly client who plans to retire soon is not a suitable recommendation, especially to a client who is risk averse and seeking preservation of capital. Finally, Sobhani has violated Standard V (A)-Diligence and Reasonable Basis because his recommendation that Poundston invest a large percentage of her assets in equities in an already highly priced market does not appear to be based on any evidence or analysis.

3. Solution: A.

Standard IV(C)-Responsibilities of Supervisors has been violated. As to it requires members and candidates with supervisory responsibility to understand what constitutes an adequate compliance system for their firms and to make reasonable efforts to see that appropriate compliance procedures are established, documented, communicated to covered personnel, and followed. "Adequate" procedures are those designed to meet industry standards, regulatory requirements, the requirements of the Code and Standards, and the circumstances of the firm. Once compliance procedures are established, the supervisor must also make reasonable efforts to ensure that the procedures are monitored and enforced. By not updating his compliance policies and procedures since founding his company, Sobhani has violated this standard.

4. Solution: A.

Sobhani has only stated historical returns for these types of investments based on research of other similar investments. In addition, he has not promised a specific return. Thus Sobhani is not in violation of Standard III(D)-Performance Presentation. But, Sobhani is in violation of Standard III (A)-Loyalty, Prudence, and Care because he is required to identify the actual client, which in

this case would be Purce and the trust beneficiaries, the twins. From the information provided, there is no evidence that Sobhani knows or has considered the twin's investment objectives and constraints and thus is also in violation of Standard III(C)-Suitability.

5. Solution: B.

Standard VI(C)-Referral Fees requires Members and Candidates to disclose to their employer, clients, and prospective clients, as appropriate, any compensation, consideration, or benefit received from or paid to others for the recommendation of products or services before entry into any formal agreement for services. In this case, Sobhani advises clients of the referral fee arrangement after the fact, thus violating Standard VI(C).

6. Solution: C.

Sobhani has not violated Standard VI(A)-Disclosure of Conflicts because disclosure of his relationship with Wilder is not required because it would not impair Sobhani's independence and objectivity nor interfere with his respective duties to clients.

But, by not following local law and reporting his cousin's malfeasance, Sobhani violated Standard I(A)-Knowledge of the Law and as a result also violated Standard I(D)-Misconduct because his actions reflect adversely on his professional reputation and integrity.

Case 2: Kostecka（考点：**Code and standards**）

1. Solution: C.

The account should be managed according to the client's investment goal of capital preservation and a low risk tolerance. Under Standard III (A) Loyalty, Prudence, and Care, the first step for members and candidates in fulfilling their duty of loyalty to clients is to determine the identity of the "client" to whom the duty of loyalty is owed. Only when the daughter is granted legal responsibility over her father's affairs by the court does she become the client.

2. Solution: A.

Kostecka has not violated Standard III (A) Loyalty, Prudence, and Care as he has put his client's interests first. However, by not dissociating himself from the illegally embezzled funds, Kostecka has violated Standard I Knowledge of the Law. By managing these funds, Kostecka benefits directly via management fees and could be associating him with suspicious financial transactions and potentially violating anti money laundering regulations. In addition, by not dissociating himself from the embezzled funds, Kostecka has also placed his firm in a position where it may suffer reputational harm so has violated Standard IV (A) Duties to Employers (Loyalty).

3. Solution: B.

Kostecka's board service creates the opportunity to receive material nonpublic information involving Jabbertalk and is a basic conflict of interest.

As a result, according to Standard VI (A) Conflicts of Interest, the directorship should be disclosed. Members and candidates must make full and fair disclosure of all matters that could reasonably be expected to impair their independence and objectivity or interfere with respective duties to their clients, prospective clients, and their employer. Because the member has not made any disclosure concerning his board membership, he is in violation of Standard VI (A).

Kostecka has also ignored his client's mandate of low risk tolerance and capital preservation and is in violation of Standard III (C) Suitability. In addition, Nathoo has violated her fiduciary duty as a "trustee" of the account as she failed to manage her fathers' portfolio in accordance with his wishes.

4. Solution: C.

Standard III (B) Fair Dealing requires members and candidates to deal fairly and objectively with all clients when providing investment analysis, making investment recommendations, taking investment action, or engaging in other professional activities. When Kostecka informs clients of the upcoming investment recommendation by Forkson, he has treated all clients fairly because

this disclosure is provided to all of his current clients.

5. Solution: B.

Statements overstating the competency of an individual or imply, either directly or indirectly, that superior performance can be expected from someone with the CFA designation are not allowed under Standard VII (B) Reference to CFA Institute, the CFA Designation, and the CFA Program. The Standard specifically states when referring to the CFA Institute, CFA Institute membership, the CFA designation, or candidacy in the CFA Program, members and candidates must not misrepresent or exaggerate the meaning or implications of membership in the CFA Institute, holding the CFA designation, or candidacy in the CFA Program.

6. Solution: A.

Kostecka's performance presentation of his firm's composite performance is in compliance with Standard III (D) Performance Presentation.

Case 3: KingFisher（考点：Code and standards）

1. Solution: A.

It is a violation of Standard VII (B): Reference to CFA Institute, the CFA Designation, and the CFA Program to imply that the competencies of a CFA charter holder are superior to those of others not holding the designation. It is not a violation, however, to factually state that charter holders must annually renew their commitment to abide by the Code and Standards or that each of the team members passed all three CFA exams on their first attempt.

2. Solution: A.

Standard III (B): Fair Dealing accommodates the differentiation of services to clients as long as such services are not offered selectively. The different service levels should be disclosed to clients and prospective clients and should be available to everyone. A requirement to disclose all conflicts of interest would not violate Standard VI (A): Disclosure of Conflicts, nor would the outline of all compensation arrangements violate Standard IV (B): Additional Compensation Arrangements.

3. Solution: B.

Kingfisher's proposed general principles related to Capital Market Integrity properly address in principle Standard II (A): Material Nonpublic Information and Standard II (B): Market Manipulation. Standard II (A) does not disallow the possession of insider information but does disallow using the information to take unfair advantage of the general investing public. Standard II (B) requires the prohibition of market manipulation—that is, dissemination of false or misleading information and transactions that deceives or would be likely to mislead market participants by distorting the price-setting mechanism of financial instruments.

4. Solution: A.

Standard III (A): Loyalty, Prudence, and Care require a client's portfolio to be managed by investment guidelines agreed on with the client. Some clients' investment objectives may not allow for a diversified portfolio across all asset classes available. Therefore, it may violate Standard III (A) to include all asset classes available.

5. Solution: C.

It is recommended that firms develop and use measurable criteria for assessing the quality of research to help comply with Standard V (A): Diligence and Reasonable Basis. Therefore, the research recommendations need to be assessed to determine their validity over time. Did the

process and the analyst's view lead to the right recommendation? If over time recommendations consistently prove to be wrong, perhaps the research processes need to be changed-or the analysts themselves.

6. Solution: C.

Task 1 is insufficient in that Standard IV(C): Responsibilities of Supervisors requires supervisors to enforce non-investment-related policies as well as investment-related policies.

2. Quantitative

Case 1: Paul Charlent（考点：Regression）

1. Solution: B.

The coefficient of determination (R^2) is 0.0263. Such a low R^2 indicates that the regression has little explanatory power—that is, less than 3% of the variation in the SET Index is explained by the variation in LIBOR. The insignificance of the F-test in Exhibit 2 confirms this lack of explanatory power. The slope coefficient is not significant (p-value = 0.1285), again confirming that this regression has little explanatory power.

2. Solution: C.

The intercept coefficient of the regression line is 0.031. The p-value indicates that the probability of having a sample result of 0.031 when the underlying population coefficient is zero is about 4.89%. As this p-value is less than 5%, we reject the null hypothesis for the intercept. The slope coefficient is –0.732. The p-value indicates that the probability of having a sample result of –0.732 when the underlying population coefficient is zero is about 12.85%. As the p-value exceeds the 5% level of significance, we fail to reject the null hypothesis for the slope coefficient. Note that you can also answer the question by examining the reported confidence intervals. The 95% confidence interval for the intercept does not contain zero (we reject the null). The 95% confidence interval for the slope does contain zero (we accept the null).

3. Solution: C.

The regression equation is ln(1 + SET Index return) = 0.031 – 0.732 × ln(1 + LIBOR).

If LIBOR is 3%, then ln(1 + SET Index return) = 0.031 – 0.732 × 0.02956 = 0.00936.

Continuing, exp[ln(1 + SET Index return)] = exp(0.00936) and therefore,

1 + SET Index return = 1.00941.

The estimate of the SET Index return is 0.941%.

4. Solution: A.

The value of the Durbin Watson statistic exceeds the upper critical value (1.9566 > 1.73). We fail to reject the null hypothesis of no positive serial correlation. The value of the DW statistic is less than the value (4 – 1.59) = 2.41. Thus, we also fail to reject the null hypothesis regarding negative serial correlation.

5. Solution: C.

The high pair wise correlations of Exhibit 5, especially the correlation between LIBOR and Fed

funds, suggest a multicollinearity problem. In the presence of multicollinearity, R^2 values and F-statistics are overstated and estimates of the coefficients become extremely imprecise and unreliable.

Case 2: Leysen Tesiro（考点：Regression）

1.　Solution: A.

Cost of finished jewelry = 11.06 + 2.897 * (cost of gold)

$2,000 = 11.06 + 2.897 * (cost of gold)

Price of gold = ($2,000 - 11.06) / 2.897 = $686.55

2.　Solution: A.

Singh is correct that a change in the relationship between gold prices and jewelry costs

would be an example of parameter instability.

Hara is correct to fail to reject the null hypothesis that the value of the slope coefficient is equal

to 4.0 at the 5% level of significance.

The critical t-value for the slope coefficient with 31 - 2 = 29 df at the 5% level for a two-tailed test

is 2.045. The test statistic is (2.897 - 4.000)/0.615 = -1.79. The absolute value (1.79) is less than

2.045, and the correct decision is to fail to reject the null hypothesis that the slope coefficient is

equal to 4.0.

3.　Solution: B.

Biscayne is incorrect in the specification of the formula because the appropriate R^2 to use in

calculating a Breusch-Pagan chi-square statistic is not the R^2 of the regression of jewelry prices

on gold prices but rather the R^2 of the regression of squared residuals from the original

regression on the independent variable(s).

4.　Solution: C.

Singh is incorrect because a potential result of misspecifying a regression equation is

nonstationarity (not stationarity, which is desirable).

Biscayne is incorrect because the effect of omitting an important variable in a regression is that

the regression coefficients are often biased (not unbiased) and/or inconsistent.

5.　Solution: C.

While Hara is correct about the remedy for multicollinearity (i.e., remove one or more of the

highly correlated independent variables), he is incorrect about the effect of reducing the number

of independent variables on the coefficient of determination R^2. R^2 never increases when

independent variables are dropped.

6.　Solution: B.

Biscayne is incorrect because a serial correlation problem can be corrected by using the Hansen method to adjust the coefficient standard errors, not the R^2.

Case 3: Eduardo DeMolay（考点：Time series）

1. Solution: A.

When modeled using a first-order autoregressive (AR(1)) model, as in the formula given in Exhibit 1, random walks will have an estimated intercept coefficient near zero and an estimated slope coefficient on the first lag near one. Therefore, his statement is correct.

2. Solution: A.

If a time series is a random walk, "the best forecast of x_t that can be made in period $t-1$ is x_{t-1}". So the best forecast of the next period's trailing P/E is the current period's trailing P/E.

3. Solution: B.

We can test whether a time series is ARCH by regressing the squared residuals from a previously estimated time series model on a constant and one lag of the squared residuals (as in Exhibit 2). If the estimate of the slope (c_1 in Exhibit 2) of the regression of the squared residuals on the lagged one period squared residuals is statistically significantly different from zero, the time series is ARCH(1).

4. Solution: C.

Select and justify the choice of a particular time series model from a group of models. "First, if ARCH exists, the standard errors for the regression parameters will not be correct. In case ARCH exists, we will need to use generalized least squares to modify the model.

5. Solution: A.

When working with two time series in a regression analysis, both of the series must be tested for the presence of a unit root. If neither series has a unit root, we can safely use linear regression.

6. Solution: C.

If the two series each have a unit root, regression results will be consistent provided that the two series are cointegrated.

Case 4: William Shears（考点：**Time series**）

1. Solution: B.

A logarithmic transformation of the dependent variable is the most appropriate transformation to apply when the variable grows at a constant rate over time:

ln(sales) = a* + b*t + e

The slope of this equation equals the nominal constant rate. The effective rate equals e^{b*} - 1.

2. Solution: C.

Quarter 1 of 2009 is the 61st quarter (starting with Quarter 1 of 1994): sales = 10 + 16(61) = \$986 million.

3. Solution: A.

The mean reverting value equals the intercept divided by 1 minus slope = 20/ (1—0.10)

= 20 / 0.90 = \$22.22 million. The last change was \$50 million as shown in Exhibit 5 (1000 - 950). Therefore, the AR(1) model predicts that the series will fall anytime the current value (the last quarter in 2008) is above the mean reverting value. The change in sales for the last quarter in 2008 was \$50 million, which exceeds the mean reverting value. We could also have computed the forecasted change in sales for Quarter 1, 2009 as 20 + (0.1) x 50 = 25 (which is lower than the previous change of 50).

4. Solution: C.

Seasonality refers to repeating patterns each year. Using quarterly data, tests of seasonality focus on the 4th lag (i.e., "same time last year"). The autocorrelation for the 4th lag is statistically significant. This can be observed by comparing the reported p-value (0.02), which is less than the level of significance (0.05).

5. Solution: B.

Autoregressive conditional heteroskedasticity refers to an autoregressive equation in which the variance of the errors terms is heteroskedastic (i.e., error variance is not constant). The presence of ARCH is tested with the following regression:

$$e_t^2 = \beta_1 + \beta_2 e_{t-1}^2 + v_t$$

which serves as a proxy for:

$$\text{var}(e_t) = \beta_1 + \beta_2 \text{ var}(e_{t-1}) + v_t$$

Exhibit 4 indicates that the slope estimate in the ARCH equation is not significant (the t-statistic

for the slope estimate of the ARCH equation is not significant). Therefore, the squared error does not depend on its lagged value (i.e., if the slope equals zero, then the error variance equals the constant β_1 which indicates no conditional heteroskedasticity in the AR model). ARCH is not present.

6. Solution: B.

The most recent change in sales reported in Exhibit 5 was $50 million (i.e., an increase from $950 million to $1,000 million). Therefore, the one-step-ahead forecast is 20 + 0.1(50) = $25 million and the two-step-ahead forecast is 20 + 0.1(25) = $22.5 million.

3. Economics

Case 1: Tremblay（考点：**Currency Exchange Rates, Economic Growth**）

1. **Solution: B.**

The mid-market for CAD/USD is (1.2138 + 1.2259)/2 = 1.21985. The mid-market forward premium (discount) is calculated as:

$$F_{P/B} - S_{P/B} = S_{P/B} \left[\frac{\dfrac{Actual}{360}}{1 + i_B \dfrac{Actual}{360}} \right] (i_P - i_B)$$

In this problem, we have:

$$F_{P/B} - S_{P/B} = 1.21985 \left[\frac{\dfrac{90}{360}}{1 + 0.048 \dfrac{90}{360}} \right] (0.041 - 0.048) = 1.21985 \times 0.2470356 \times (-0.007) = -0.0021094$$

2. **Solution: B.**

The relative version of PPP states that the percentage change in the spot exchange rate will be completely determined by the difference between the foreign and domestic inflation rates. In this case, the difference in the inflation rates is 1.90%–2.30% =–0.4%. Subtracting 0.4% from the current bid gives the answer 1.2089. The calculation is 1.2138 – (0.004 × 1.2138) = 1.2089.

3. **Solution: C.**

It is cheaper to buy Canadian dollars indirectly through Brazilian reals than directly with U.S. dollars. This creates a triangular arbitrage opportunity:

US$1,000,000 × 2.3844 = BRL2,384,400

2,384,400 × 0.5250 = C$1,251,810

C$1,251,810/1.2259 = US$1,021,135

US$1,021,135 – US$1,000,000 = US$21,135 profit

4. **Solution: B.**

Baroque's comments describe the international Fisher effect. The international Fisher effect states that the foreign-domestic nominal yield spread will be solely determined by the foreign-domestic expected inflation differential.

5. **Solution: A.**

Tremblay's first justification describes "club convergence." Her second justification describes a second source of convergence–imitating or adopting technology already widely used in the advanced countries. Convergence is consistent with the neoclassical growth model.

6. **Solution: C.**

The possibility for permanent higher growth in per capita output exists within endogenous growth theories but not in neoclassical growth theory nor in classical growth theory.

Case 2: AnaKonda（考点：Economic Growth）

1. **Solution: C.**

Medeva's comment is most accurate. The percentage change in stock market value equals the percentage change in GDP plus the percentage change in the share of earnings (profit) in GDP plus the percentage change in the price-to-earnings multiple. Over short to immediate horizons, all three of these factors contribute to appreciation or depreciation of the stock market. In the long run, however, the growth rate of GDP must dominate. As noted, the ratio of earnings to GDP cannot rise forever.

2. **Solution: B.**

Steady state of growth = $\Delta Y/Y = \theta/(1 - \alpha) + n$,

Where

θ = growth rate of TFP (in this case, 2.25).

$(1 - \alpha)$ = labor cost in total factor cost (in this case, 0.689).

n = labor force growth (in this case, 2%).

For Country X: $\Delta Y/Y = 2.25/0.689 + 2 = 5.27\%$.

3. **Solution: B.**

Using the labor productivity growth accounting equation, Country Z indicates the highest growth rate in potential GDP.

Growth rate in potential GDP = Long-term growth rate of labor force + Long-term growth rate in labor productivity.

Country	Long-Term Labor Force Growth (%)	Long-Term Growth Rate in Labor Productivity (%)	Growth Rate in Potential GDP (%)
X	2.00	0.80	2.80
Y	0.50	2.40	2.90
Z	1.25	1.75	3.00

4. **Solution: B.**

Rajan's conclusions pertaining to Country Y are most consistent with the neoclassical model. Because of diminishing marginal returns to capital, the only way to sustain growth in potential GDP per capita is through technological change or growth in total factor productivity. This change

results in an upward shift in the production function—the economy produces more goods and services for any given mix of labor and capital inputs.

5. **Solution: A.**

Country Z has the highest real interest rate according to the International Fisher effect. The Fisher effect breaks down the nominal interest rate (I) in a given country into two parts: (1) the real interest rate in that particular country (r) and (2) the expected inflation rate (π) in that country.

I = r + π, where r = Current nominal interest rate and π = Expected inflation rate.

	r = I + π	Real Interest Rate
Country X	6.85 – 3.95 =	2.90%
Country Y	8.00 – 5.25 =	2.75%
Country Z	5.67 – 2.67 =	3.00%

Case 3: Sagara（考点：**Economic Growth, Regulation**）

1. **Solution: C.**

Substantive law focuses on the rights and responsibilities of entities and relationships among entities. A well-developed legal system of substantive and procedural laws and respect for property rights are likely to encourage growth, not limit it. Factors that limit growth include restrictions on imports and low rates of saving.

2. **Solution: C.**

The stated conclusion is accurate in its entirety. The Cobb–Douglas function exhibits constant returns to scale, which means that if all inputs are increased at the same percentage, then output rises at that percentage. Diminishing marginal productivity exists with respect to each individual input (if the other input is held constant). Continued growth in per capita output is possible even in the steady state as long as there is ongoing technological progress (increases in TFP).

3. **Solution: A.**

Both her comments are incorrect. In the Dutch disease scenario, currency appreciation driven by strong export demand for resources makes other segments of the economy, in particular manufacturing, globally uncompetitive. She is also incorrect regarding direct ownership of the rubber plantations by foreigners; access to natural resources is essential but ownership is not.

4. **Solution: A.**

N'Diarra's understanding of classical growth theory is correct, as is her understanding of its implications. Classical growth theory holds the view that the growth rate of real GDP per person is temporary because of population explosion. Her description of endogenous growth theory is not accurate. She references a steady state rate of growth and diminishing marginal returns, which are tenets of neoclassical growth theory.

5. **Solution: C.**

Banantoumou's concern is an example of regulatory capture. Regulated companies' efforts to fight particular regulations tend to attract more public attention than when the companies are sympathetic to the contemplated regulations. Even more fundamentally, academics have argued that regulation often arises to enhance the interests of the regulated, often called the "regulatory capture" theory. For example, regulatory actions and determinations can restrict potential competition and coordinate the choices of rivals.

6. **Solution: A.**

Some independent regulators are SROs empowered to enforce the law. They do not typically rely on government funding.

Case 4: Anderson Brothers（考点：**Currency Exchange Rates, Economic Growth, Regulation**）

1. **Solution: B.**

While ability of the self-regulating organizations (SROs) and their enforcement powers are important, the most important element is being properly supervised by formal government authorities.

2. **Solution: B.**

Given low capital mobility, a restrictive monetary and fiscal policy should lead to domestic currency appreciation under the Mundell-Fleming model.

3. **Solution: B.**

Under the neoclassical growth theory, capital deepening affects the level of output but not the growth rate in the long run. Once an economy reaches steady-state growth, only further technological progress will increase the growth rate.

4. **Solution: A.**

GBP/SFr = GBP/USD*USD/SFr.

We are given USD/GBP, so we convert the provided quotes:

$$(\frac{GBP}{USD})_{bid} = \frac{1}{(\frac{USD}{GBP})_{offer}} = \frac{1}{2.0020} = 0.4995$$

And

$$(\frac{GBP}{USD})_{offer} = \frac{1}{(\frac{USD}{GBP})_{bid}} = \frac{1}{2.0010} = 0.4998$$

Now,

$$(\frac{GBP}{SFr})_{bid} = (\frac{GBP}{USD})_{bid} \times (\frac{USD}{SFr})_{bid} = 0.4995 \times 0.8550 = 0.4271$$

And

$$(\frac{GBP}{SFr})_{offer} = (\frac{GBP}{USD})_{offer} \times (\frac{USD}{SFr})_{offer} = 0.4998 \times 0.8560 = 0.4278$$

The GBP/SFr quote should be: GBP/SFr= 0.4271 – 78.

5. **Solution: A.**

The original 60-day forward contract calls for long GBP. So the all-in forward price FP= 2.0085.

After 30 days, the contract would still have 30 days remaining to expiration. The new 30-day

all-in forward price to sell GBP is 2.0086 + (7.6/10,000) = 2.00936. The relevant 30-day USD interest rate is 4%.

$$V_t = \frac{(FP_t - FP)(\text{contract size})}{1+R(\frac{days}{360})} = \frac{(2.00936 - 2.0085)(1,000,000)}{1+0.04(\frac{30}{360})} = \text{USD } 857.14$$

6. **Solution: B.**

Covered interest rate parity requires that

$$\frac{F}{S} = \frac{1+R_\$}{1+R_{BU}}$$

$$\frac{F}{S} = \frac{2.10}{2.00} = 1.05$$

$$\frac{1+R_\$}{1+R_{BU}} = \frac{1+0.05}{1+0.03} = 1.019$$

The BUN should appreciate by 1.9% per year. However, in the forward market, the BUN is trading at a premium of 5%. Therefore, the appropriate arbitrage strategy is to sell BUN in the forward market as below:

1. Borrow $1,000 at 5%. At the end of one year, Williams will be obligated to repay $1,000(1.05) = $1,050.

2. Convert the $1,000 to BUN at the spot rate, which yields $1,000 / ($2/BUN) = BUN 500.

3. Simultaneously enter into a 1-year forward contract to convert BUN to USD at the forward rate of $2.1000/BUN.

4. Invest BUN 500 at 3%. In one year, Williams will receive proceeds of BUN 500 (1.03) = BUN 515.

5. Convert the BUN 515 back to USD at the forward rate, which was locked in at the beginning of the year and yields BUN 515 ($2.1/BUN) = $1,081.50.

6. Arbitrage profits = $1,081.50 − $1,050 = $31.50.

4. Financial Reporting and Analysis

Case 1: Turner (考点：Inter-corporate Investment)

1. Solution: A.

For fair value through profit or loss investments, the dividends plus the change in fair value are accounted for in net income. For the investments that are available for sale only, dividends received affect net income. For associate companies, the equity method recognizes the share of the investee's net income.

Investment	Classification	Income effect	C$ (thousands)
Alton	Fair value through profit or loss	Dividends + Unrealized gain (loss)	1,000 (3,000)
Barker	Available for sale	Dividends	2,000
Cosmic	Available for sale	Dividends	3,000
Darnell	Equity method	% of investees' net income	15,000
Total			18,000

2. Solution: B.

Only the equity securities that were designated as available for sale (Barker and Cosmic) could have been designated at fair value, and the unrecognized gains from those securities would then be included in income. Because Foster is a manufacturing company and not a venture capital or mutual fund company, it cannot account for its significant influence in Darnell using fair value.

Income would be equal to the dividends from Alton, Barker, and Cosmic plus the changes in market value for those same three securities plus the income from Darnell using the equity method.

Investment	Dividends (C$ thousands)	Unrecognized gains (losses) (C$ thousands)	C$ Total (thousands)
Alton	1,000	(3,000)	(2,000)
Barker	2,000	1,000	3,000
Cosmic	3,000	7,000	10,000
Darnell	Equity method	% of investees' net income	15,000
Total			26,000

3. Solution: A.

Associated companies are ones in which the investor (Foster) can exercise significant influence. In addition to ownership between 20–50% (Foster owns 40%), significant influence may be evidenced by representation on the board of directors (Foster has representation on Darnell's

board) or by material transactions between the two companies.

There were transactions between Darnell and Foster, but they were not a material portion of Darnell's net income.

Net income reported on the sales = $187.5 thousand.

Darnell's total income for the year = $15,000/40% = $37,500 thousand.

Share of net income from intercompany sales = 187.5/37,500 = 0.005%, which is not material.

Thus, the extent of intercompany transactions least supports the classification of Darnell as an associated company.

4. Solution: B.

The fair value through profit or loss (Eldon) and available-for-sale (Fizz) securities are carried at market value on the balance sheet. The two held-to-maturity securities (Gilt and Harp) were purchased at par value, thus their carrying value will not change during the life of the investment (there is no premium or discount to amortize).

Investment	Classification	Year-End Carrying Value (C$ thousands)
Eldon	Fair value through profit or loss	$23,000
Fizz	Available for sale	45,000
Gilt	Held to maturity	50,000
Harp	Held to maturity	60,000
Total		$178,000

5. Solution: A.

For fair value through profit or loss investments, the interest income earned plus the change in fair value are accounted for in net income. For the investment that is available for sale, only the interest income earned affects net income because the unrealized gain goes to other comprehensive income. For the two held-to-maturity securities, only the interest income earned affects net income.

Investment	Classification	Income effect	C$ (thousands)
Eldon	Fair value through profit or loss	Interest income + Unrealized gain	1,000 3,000
Fizz	Available for sale	Interest income	2,000
Gilt	Held to maturity	Interest income	2,000
Harp	Held to maturity	Interest income	5,000

Total			13,000

6. Solution: A.

Reason 3, that Gilt has suspended the most recent (see "note b" of Exhibit 2) and expected future interest payments until it restructures, is the best reason to consider the investment in Gilt is permanently impaired.

Case 2: AdOre (考点：Inter-corporate Investment)

1. Solution: B.

In 2011, although Glace had less than 20% ownership interest in AdOre, it was considered to have significant influence, which required the equity method.

2. Solution: A.

In 2011, Strawberry Mines used the equity method because it exercised significant influence and owned 32% of AdOre. Under the equity method, it should recognize its percentage share (32% × 18,182 = 5,818.2) of AdOre's net income.

3. Solution: C.

In 2011, Strawberry Mines owned 32% of AdOre's stock and had significant influence; therefore, it should have used the equity method. It will not report any dividends received from AdOre as income but would have deducted the dividends received from the carrying value of the investment in AdOre.

4. Solution: B.

In 2011, Cupernico had a controlling interest in AdOre and would have used the consolidation method. In consolidation, companies combine all of the assets, liabilities, revenues, and expenses of subsidiaries with the parent. Therefore, Cupernico would have included $40,000 (100%) of AdOre's long-term debt.

5. Solution: C.

In 2012, Cupernico and Glace shared joint control. Cupernico must use the equity method under US GAAP; if the ownership structure had not changed, Cupernico would have continued to use the consolidation method.

	Equity Method (Joint Control)	Consolidation (Control)	Comparison
Net income (NI)	Includes 50% of AdOre's net income as investment income	Once non-controlling interest is deducted, the net effect is that 50% of AdOre's net income is included	Same
Revenues	Includes only Cupernico's	Includes 100% of AdOre's plus Cupernico's	Lower under equity

Net profit margin = NI/Revenues			Higher under equity method because of lower revenues (after the change)
Equity	Includes only Cupernico's	Includes Cupernico's plus the non-controlling interest of AdOre	Lower under equity
ROE = NI/Equity			Higher under equity method because of lower equity
Total assets	Includes 50% of net assets of AdOre as Investment	Includes 100% of AdOre's assets added to Cupernico's	Lower under equity
ROA = NI/Assets			Higher under equity method because of lower assets

6. Solution: A.

Fair value of consideration for 80%	$54,400	
Minus 80% of fair value of identifiable net assets	52,000	80% × $65,000
Goodwill, under partial goodwill method	$2,400	

Case 3: Luhvul Cooperage Case Scenario (考点：Employee Compensation)

1. Solution: B.

Compensation expense arising from executive stock options is based on the estimated fair value of the options on the grant date and amortized on a straight-line basis over the service period. The service period is the period between the grant date and the vesting period. The vesting date is the first date on which the options can be exercised.		
Total compensation expense:	50,000 options × $4.38/option =	$219,000
Vesting period		4 years
Annual compensation expense	$219,000 ÷ 4 years =	$54,750

2. Solution: A.

Observation 1	Correct	The downside risk is the same under both plans– namely, zero. Management is not penalized if the share price falls or if the accounting metrics are missed; they simply don't receive a bonus.
Observation 2	Incorrect	Although the vesting period for both plans is the same, the expenses will differ because the total amount to be expensed is determined differently under stock options and stock grants. The expense under the current option plan is based on the estimated fair value of the option, but the expense under the proposed stock grant plan is based on the actual current share price.
Observation 3	Incorrect	The new stock awards plan will have no effect on the debt/equity ratio because there will be no change in equity: Retained earnings will be decreased by the amount of the expense and paid-in capital increased by an equivalent amount.

3. Solution: A.

Under U.S. GAAP, joint ventures must be accounted for using the equity method.

Case 4: Stanley Bostwick (考点：Employee Compensation)

1. Solution: A.

In a defined contribution plan, pension expense is equal to the amount contributed by the firm. The plan participants bear the shortfall risk. There is no pension obligation in a defined contribution plan.

2. Solution: C.

Under U.S. GAAP and under IFRS, Global Oilfield would report the funded status in its balance sheet.

3. Solution: C.

The assumed discount rate increased from 6.25% in 20X7 to 6.75% in 20X8 (Exhibit 4). There is an inverse relationship between the discount rate and the present value of a future sum. Thus, the increase in the discount rate resulted in an actuarial gain (lower PBO). An increase in life expectancy would result in an actuarial loss. Decrease in expected rate of return would increase reported pension expense but would not affect PBO.

4. Solution: C.

A decrease in the compensation growth rate will reduce service cost. Lower service cost will result in lower pension expense and, thus, higher net income. Lowering the compensation growth rate will also reduce the PBO. A lower PBO will increase the funded status of the plan (make the plan appear more funded). The compensation growth rate assumption has no effect on the plan assets.

5. Solution: B.

For the year-ended 20X8, Global Oilfield's reported pension expense was €8,028 (Exhibit 3), and its total periodic pension cost was €3,410. Total periodic pension cost can be calculated as plan contributions minus the change in funded status [€5,000 — (€2,524 funded status for 20X8 — €934 funded status for 20X7)].

6. Solution: A.

Total periodic pension cost represents the true cost of the pension. If the firm's contributions exceed its true pension expense, the difference can be viewed as a reduction in the overall pension obligation similar to an excess principal payment on a loan. Pension contributions are reported as operating activities in the cash flow statement while principal payments are reported

as financing activities. Thus, the adjustment involves increasing operating cash flow by €750 (€5,000 employer contributions — €4,250 total periodic pension cost) and decreasing financing cash flow by the same amount.

Case 5: Lauren Jacobs (考点：Employee Compensation)

1. Solution: B.

Funded status equals fair value of plan assets minus PBO (395 - 635 = —240). Because the funded status is negative, Iron Parts would report a liability of $240 million.

2. Solution: A.

Discount rate increased from 5.5% to 6.0%. An increase in the discount rate will result in lower service cost. Lower service cost will result in a lower PBO. A lower PBO will result in a higher funded status (more funded). Lower service cost will result in lower pension expense and higher retained earnings. The impact on interest cost cannot be determined without more information.

3. Solution: C.

$327 beginning balance plan assets + $37 actual return + contributions - $22 benefits paid = $395 ending balance plan assets. Solving for the contributions, we get $53.

4. Solution: C.

The higher expected return reduces pension expense. Lower pension expense results in higher net income. Higher net income results in higher retained earnings. Neither the PBO nor the funded status is affected by the expected return on plan assets.

5. Solution: C.

Amount reported under IFRS:

Service cost	$37
Interest cost[1]	$10.4
Past service cost	$80
Pension cost on P&L	$127.4 million

Interest cost = discount rate x beginning funded status = 0.06 x (500 — 327)

6. Solution: B.

Total periodic pension cost can be calculated by summing the changes in the PBO for the period (excluding benefits paid) and then subtracting the actual return on assets. The change in the PBO (excluding benefits) is $157 (635 reported 20X8 PBO + 22 benefits paid - 500 reported 20X7 PBO). Subtract the actual return to get economic pension expense of $120 (157 change in PBO excluding benefits paid - 37 actual return).

Alternatively, total periodic pension cost is equal to contributions minus change in funded status.

20X8 funded status was -240 (395 plan assets — 635 PBO) and the funded status for 20X7 was -173 (327 plan assets - 500 PBO). Contributions were $53 (calculated in Question 21). Thus, total periodic pension cost is $120 [53 - (-67)].

Case 6: WMC (考点：Multinational Operations)

1. Solution: C.

Because YTC operates independently and makes its own financing decisions, the local currency (AUD) should be the functional currency. Current rate method should be used. Under the current rate method, all of the income statement items are translated using the average rate for the year.

2015   translated net income = 25 / 1.30 = 19.23

2016   translated net income = 12 / 1.45 = 8.28

Growth in net income = (8.28 / 19-23) - 1 = -56.94%

2. Solution: B.

Under the temporal method, the nonmonetary assets and liabilities are remeasured at historical rates. Thus, only the monetary assets and liabilities are exposed to changing exchange rates.

Since YTC has net monetary liability, WMC exposed to loss when the foreign currency (AUD) is appreciating.

3. Solution: B.

Total asset turnover = revenue / total assets

Revenues are translated using the same average exchange rate in the temporal and current rate methods. Under the current rate method, assets are translated using the current rate. Under the temporal method, monetary assets are translated using the current rate, and nonmonetary assets are translated using the historical rate. Because the historical rate is lower than the current rate, the nonmonetary assets (and therefore total assets) will have a higher value under the temporal method. A higher asset value means a lower total asset turnover ratio under the temporal method.

The calculation of the total asset turnover ratio using both methods is provided for reference below:

	Temporal		*Current Rate*	
Cash	20 / 1.50 =	13.33	20 / 1.50 =	13.33
Accounts receivable	460 / 1.50 =	306.67	460 / 1.50 =	306.67
Inventories	30 / 1.20 =	25.00	30 / 1.50 =	20.00
Prepaid expenses	25 / 1.20 =	20.83	25 / 1.50 =	16.67
Fixed assets	400 / 1.20 =	333.33	400 / 1.50 =	266.67
Total assets		699.16		623.34
Revenues	870 / 1.45 =	600.00	870 / 1.45 =	600.00
Total asset turnover	600.00 / 699.16 =	0.86	600.00 / 623.34 =	0.96

4. Solution: A.

AUD revenue growth rate = (870 / 765)1/2 - 1 = 6.64%

Revenues are translated at average rate:

2014 USD revenues = 765 / 1.40 = 546.43; 2016 USD revenues = 870 / 1.45 = 600 USD revenue

growth rate = (600 / 546.43)1/2 — 1 = 4.79%

The USD revenue growth rate is 1.85% lower than the local currency (AUD) revenue growth rate.

5. Solution: C.

Under both the current rate and temporal methods, the revenues for the Ukrainian subsidiary would be translated using the average rate. Cost of goods sold (COGS) would be translated using the historical rate for the temporal method and the average rate for the current rate method. When a currency is depreciating, the COGS based on historical cost (temporal method) will be higher than COGS translated at the average rate (current rate method) since the average rate will incorporate the historical exchange rate and the most recent (depreciated) exchange rate, decreasing the COGS. Since translated sales are the same under both methods, gross profit and the gross profit margin will be higher under the current rate method.

6. Solution: C.

U.S. accounting standards define a hyperinflationary economy as one in which the 3-year cumulative inflation rate exceeds 100%. The Indian economy can be characterized as hyperinflationary. The inflation rate over the past three years can be calculated as follows:

Year 1 inflation= [(1+ 0.3464) / (1 + 0.020)]-1= 32%

Year 2 inflation= [(1+ 0.2915) / (1 + 0.025)] -1= 26%

Year 3 inflation= [(1+ 0.2566) / (1 + 0.030)]- 1= 22%

Cumulative 3-year inflation = (1.32) (1.26) (1.22)- 1= 103%

U.S. accounting standards allow the use of the temporal method, with the functional currency being the parent's reporting currency, when a foreign subsidiary is operating in a hyperinflationary environment. IFRS accounting standards allow the parent to translate an inflation-adjusted value of the nonmonetary assets and liabilities of the foreign subsidiary at the current inflation rate, removing most of the effects of high inflation on the value of the nonmonetary assets and liabilities in the reporting currency. In a hyperinflationary environment, the parent company can reduce translation losses by reducing its net monetary assets or increasing its net monetary liabilities. In order to do this, the parent should issue debt denominated in the subsidiary's local currency and invest the proceeds in fixed assets for the

subsidiary to use in its operations.

Case 7: Ota L' Abbe (考点：Multinational Operations)

1.   Solution: C.

Subsidiaries whose operations are well integrated with the parent will use the parents currency as the functional currency. When the functional currency is the same as the parent's presentation currency (reporting currency), as it is in this case, the temporal method is used. Therefore, Statement 1 is incorrect.

Self-contained, independent subsidiaries whose operating, investing, and financing activities are primarily located in the local market will use the local currency as the functional currency. When the functional currency is not the same as the parent's presentation currency (reporting currency), as in this case, the current rate method is used. Therefore, Statement 2 is incorrect.

2.   Solution: A.

Sales will be lower after translation because of the depreciating U.S. dollar

3.   Solution: B.

Depreciation expense and COGS are remeasured at the historical rate under the temporal method. Under the current rate method, depreciation and COGS are translated at the average rate. Because the U.S. dollar is depreciating, depreciation expense and COGS are lower under the current rate method.

4.   Solution: B.

The Canadian dollar is the functional currency because the subsidiary is highly integrated with the parent. Therefore, the temporal method applies.

Step 1: Remeasure the balance sheet using the temporal method.

	2008 (USD)	Rate	2008 (CAD)
Cash and account receivables	775,000	1.32	1,023,000
Inventory (given in Item 9)	600,000	Given	810,000
PP&E (net)	730,000	1.50	1,095,000
Total assets	2,105,000		2,928,000
Accounts payable	125,000	1.32	165,000
Long-term debt	400,000	1.32	528,000
Common stock	535,000	1.50	802,500
Retained earnings	1,045,000	(a)	1,432,500
Total liabilities and shareholders' equity	2,105,000		2,928,000

(a) Retained earnings is a plug figure that makes the accounting equation balance

CAD 2,928,000 assets - CAD 165,000 accounts payable - CAD 528,000 long-term debt

- CAD 802,500 common stock = CAD 1,432,500.

Step 2: Derive net income from the beginning and ending balances of retained

earnings and dividends paid as follows:

	CAD	
Beginning retained earnings	1,550,000	Given Item 6
Net income	(83,250)	Calculate
Dividends paid in the year	(34,250)	(25,000 x 1.37 historical rate)
Ending retained earnings	1,432,500	From Step 1

Remeasure the income statement using the temporal method.

	2008 (USD)	Rate	2008 (CAD)
Sales	1,352,000	1.35	1,825,200
Cost of goods sold (given Item 11)	(1,205,000)	Given	(1,667,250)
Depreciation expense	(140,000)	1.50	(210,000)
Remeasurement loss		(b)	(31,200)
Net income	7,000 From Step 2		(83,250)

The remeasurement loss is a plug that is equal to the difference in net income of- CAD 83,250

and income before remeasurement of-CAD 52,050 (CAD 1,825,200 sales — CAD 1,667,250 COGS

- CAD 210,000 depreciation).

5. **Solution: A.**

The local currency (the USD) is depreciating, so the historical rate will be higher than the current

rate. Fixed asset turnover (sales divided by net PP&E) will be higher under the current rate

method. Net PP&E will be translated at the lower current rate, and because sales are the same

under both methods, the ratio will be higher.

If you want to do the calculations, net PP&E under the current rate method is USD730,000 x

1.32CAD/USD = CAD 963,600, and fixed asset turnover is CAD 1,825,200/CAD 963,600 = 1.9 times.

Fixed asset turnover under the temporal method is CAD 1,825,200/CAD 1,095,000 = 1.7 times.

6. **Solution: C.**

Return on assets prior to translation will be different than the ratio after translation because the

numerator (net income) is translated at the average rate, and the denominator (assets) is

translated at the current rate using the current rate method.

Net profit margin will be the same because both the numerator (net income) and the

denominator (sales) are translated at the average rate using the current rate method.

Case 8: Ali Saminder (考点：financial institutions)

1. Solution: C.

Rule 1 is incorrect because riskier assets are assigned a higher weighting. Risk-free assets such as cash are typically assigned a weighting of zero, because their risk-free nature means that they do not need to be supported by capital. Riskier assets require more capital funding, hence the higher weighting and risk adjust value.

Rule 2 is also incorrect because off-balance sheet assets also require capital funding and hence should be included using the same risk weighting approach.

2. Solution: A.

Risk-weighted assets	601,312
Common equity tier I capital	87,390
Additional tier I capital	16,401
Tier 1 capital	103,791
Tier 2 capital	25,447
Total regulatory capital	129,238

Tier 1 ratio=$\frac{103,791}{601,312} = 17.3\%$

Total capital ratio=$\frac{129,238}{601,312} = 21.5\%$

3. Solution: C.

The internal document states that tier 1 capital is calculated in accordance with global standards, meaning that a deferred tax asset resulting from tax losses would already be excluded from tier 1 capital. A writedown would therefore not alter common tier 1 capital or the ratio

4. Solution: B.

Per Exhibit 1, convertible bonds are currently part of tier 2 capital. On conversion, they would become common stock and part of common tier 1 capital, hence tier 2 capital would decrease and common tier 1 capital would increase.

5. Solution: C.

Although client assets are client-owned and separate from the bank, and they do not require capital funding, the fees generated may be material to the earnings of the bank. Hence a significant decrease should impact the stability of the bank.

6. Solution: A.

	2015	2016	2017
High quality liquid assets	111,432	127,352	198,393
Net outflows	100,483	112,482	196,429
Liquidity coverage ratio=$\frac{high\ quality\ liquid\ assets}{net\ outflows}$	111%	113%	101%

The liquidity coverage ratio actually increased from 2015 to 2016, hence choice B is incorrect.

The net cash outflows are given for 30 days. An LCR ratio of 100% would mean JJK could withstand 30 days of stress-level outflows. To calculate the number of days JJK can withstand, multiply the LCR by 30.

	2015	2016	2017
	30×1.11	30×1.13	30×1.01
Number of days of stress volume of cash outflows	33.3	34.0	30.3

Hence A is correct, the number of days decreased by 3 days from 33.3 to 30.3.

Available net stable funding excludes highly liquid assets, hence C is incorrect.

Case 9: Galaxy Electronics Case Scenario (考点：Evaluating Quality of Financial Reporting, Employee compensation)

1. Solution: C.

The change in revenue recognition to an earlier point, before the product has been produced or delivered, is an aggressive accounting policy that would lower the company's quality of earnings.

A is incorrect. The change in the warranty expense reflects updated information, and failure to act on it would underestimate earnings.

B is incorrect. The stock grants are expensed over the estimated service life of the employees, in this case the 3 years till it vests, and does not distort the quality of earnings.

2. Solution: C.

Deposits received	$3 million
Deposit as percentage of order	25%
Revenue recognized on receipt of order	$3 million/0.25 = $12 million
Gross profit margin	Gross profit/Sales = $53,000/$100,000 = 53%
Increment to gross profit from early recognition policy	53% × $12 million = $6.36 million

A is incorrect. It calculates the change in gross profit based on the difference between the actual amount of revenue and the amount of the deposit: $0.53 \times (12 - 3) = \$4.77$.

B is incorrect. It calculates the change in gross profit based on the deposit: $0.53 \times \$3 = \$1.59$.

3. Solution: A.

The classification of warranty expense as a non-operating item reduces Galaxy's earnings quality. High-quality earnings allow investors to identify core or recurring earnings, and Galaxy's core earnings are overstated when an operating cost, like warranties, are classified as non-operating. The company disclosed the change in classification in both the MD&A and notes to the financial statements, thereby exhibiting high financial reporting quality.

B is incorrect. Galaxy has explained the change—the change may not be GAAP, but they did disclose it, exhibiting a reasonable level of reporting quality because it is still possible to assess a company's results

C is incorrect. The reclassification of an expense between operating and non-operating or non-recurring does not affect net income (and hence return on sales) but would affect the operating margin and the interpretation of core earnings.

4. Solution: B.

A DSRI (days sales in receivable index) greater than 1 indicates an inappropriate relationship between accounts receivable and revenue recognition and is a potential signal of earnings manipulation. For Galaxy, it is the largest positive contributor (DSRI = 1.619) that would increase the M score. Larger values for the M-score (and contributors) are more indicative of earnings manipulation. Increasing leverage could predispose a company to manipulate earnings, but here the leverage index is negative indicating that leverage has decreased.

A is incorrect. Higher M-scores (less negative) indicate an increased probability of earnings manipulation. Here the lower (more negative score) would indicate that the company is less likely to be manipulating earnings.

C is incorrect. Increasing leverage could predispose a company to manipulate earnings, but here the leverage index is negative, indicating that leverage has decreased.

5. Solution: A.

The compensation expense for restricted stock grants is the fair market value of the shares on the grant date, and this amount is allocated over the three-year service period because of the three-year vesting period: \$4.2 million/3 = \$1.4 million.

B is incorrect. It expenses the entire amount on the grant date.

C is incorrect. It assumes that nothing is expensed until the vesting period is over.

6. Solution: A.

Only the executive stock option plan is affected by volatility of the company's stock. The volatility affects the initial valuation of the stock options granted, for example through the use of the Black–Scholes model to determine the fair value of the options.

The initial valuation of the options determines the expense recognized. Compensation expense for stock grants is based on the fair market value of the stock on the day of the grant and is not affected by the stock's volatility.

B is incorrect. Stock options are directly affected by volatility, but stock grants are not.

C is incorrect. Stock options are directly affected by volatility, but stock grants are not.

Case 10: Treadway (考点：Evaluating Quality of Financial Reporting, Integration of Financial Statement Analysis Techniques)

1. Solution: A.

To calculate cash collections from customers, the revenue figure on the statement of earnings is adjusted for the large decreases in unearned revenue (both short-term and long-term) and the increase in accounts receivable.

(A$ thousands)		
Revenue as reported		711,200
Decrease in short-term unearned revenue	12,500 – 21,250	-8,750
Decrease in long-term unearned revenue	6,500 – 13,500	-7,000
Increase in accounts receivable	35,700 – 33,500	<u>-2,200</u>
Cash collected from customers		693,250

2. Solution: A.

Investments in associates are accounted for using the equity method. Only the dividends received from associate companies would be cash, not the amount reported as income from investments in associates. When using the equity method to account for an investment, the investment account on the balance sheet increases by the amount of accrued investment income recognized and decreases by the amount of dividends received. Therefore, analysis of the balance sheet account changes will solve for dividends (the cash).

(A$ thousands)	
Opening balance investment account	42,300
Plus investment income recognized (from Statement of Earnings)	+1,200
Deduct dividends received: Solve for X	<u>− X</u>
Closing balance investment account	42,700

Solving for X, dividends, and cash received = A$800 thousand

3. Solution: B.

The decrease in unearned revenue could be an indication of early revenue recognition as amounts previously deferred are brought into income and not replaced with new deferred revenues on the balance sheet. An increase in day's sales in receivables could be an indicator of early revenue recognition, but for CCCL the ratio did not change significantly (18.1 days in 2012 to 18.3 days in 2013 using year-end receivables). Deferred tax assets can arise from differences in revenue recognition for taxes and financial statement purposes (they would rise with increases in

unearned revenue) but there is no indication that revenue is the reason for the increase in deferred tax assets (in fact unearned revenue decreased). The deferred tax assets most likely arise from the loss carry forwards generated from earlier losses.

4. Solution: B.

In 2013, CCCL started capitalizing the discount offered (from selling the handsets at a lower price) instead of recording it in the period it is incurred. This change in the policy would increase net income (by lowering expenses) and cash from operations. The amounts capitalized would be recorded as cash outflows for investing activities, compared with cash from operations if they were expensed.

5. Solution: C.

The broadcast licenses were written down in 2011 but the write-down was reversed in 2013. Therefore, during 2012 the intangible assets were understated, which would have understated amortization expense for the year and increased profit. Thus, in 2012 net profit margin was overstated.

6. Solution: C.

To determine the amount of customer acquisition costs capitalized, analyze the changes in intangible assets as follows:

(A$ thousands)	
Opening intangible assets, net	24,500
Add impairment loss reversal	12,500
Add new broadcast licenses from MM acquisition	5,500
Add brand name from MM acquisition	2,000
Capitalized customer acquisition cost: Solve for X	X
Deduct amortization expense	− 7,250
Ending intangibles assets, net	43,250

Solving for X, capitalized customer acquisition cost = A$6,000 thousand.

Case 11: London Star Refuse Company Case Scenario (考点：Evaluating Quality of Financial Reporting, Integration of Financial Statement Analysis Techniques)

1. Solution: B.

LSRC classifies interest expense as a financing cash flow under IFRS. As such, the only adjustment necessary to operating cash flow is to add back taxes.

Adjusted operating cash flow = Net cash flow provided by operating activities + Cash paid for taxes = 2,450 + 480 = 2,930.

Operating income = EBIT = 1,520.

CFO before interest and taxes to operating income = 2,930/1,520 = 1.9.

2. Solution: C.

Net operating assets= (Total assets – Cash and short-term investments) – (Liabilities – Total debt)

Net operating assets 2012:	= (22,570 – 260) – (16,500 – 9,125) =	14,935
Net operating assets 2011	= (21,480 – 540) – (15,215 – 8,675)	14,400
Numerator (NOA$_t$ –NOA$_{t-1}$)	= 14,935 – 14,400	535
Denominator (Average NOA)	= (14,935 + 14,400)/2	14,667.50
Balance-sheet-based accruals ratio	= 535/14667.5	3.6%

3. Solution: C.

$$\text{Cash-flow-statement-based accruals ratio} = \frac{\left[NI_t - (CFO_t + CFI_t) \right]}{(NOA_t + NOA_{t-1})/2}$$

Net operating assets= (Total assets – Cash and short-term investments) – (Liabilities – Total debt)

Numerator for 2012:	= 980 – (2,450 –2,185)	715
Net operating assets 2012:	= (22,570 – 260) – (16,500 – 9,125)	14,935
Net operating assets 2011:	= (21,480 – 540) – (15,215 – 8,675)	14,400
Denominator (Average NOA):	= (14,935 + 14,400)/2	14,667.50
Cash-flow-statement-based accruals ratio		4.9%

4. Solution: C.

Both the balance-sheet-based accrual ratio and the cash-flow-statement-based accrual ratio are lower for Company 3 compared with Company 1 and Company 2. Lower ratios are indicative of higher earnings quality; thus, Company 3 has the best earnings quality.

5. Solution: C.

When derivatives are used to hedge foreign currency exposure related to a foreign investment, the gains/losses go through other comprehensive income, which is part of shareholders' equity, and thus they bypass the income statement.

6. Solution: C.

Companies tend to reduce provisions for doubtful accounts in an effort to overstate net income in a given period, which can be a warning sign of lower quality of earnings. However, LSRC is increasing provisions for doubtful accounts, which reflects a more conservative accounting practice.

5. Corporate Finance

Case 1: GigaTech (考点：Capital Budgeting)

1. Solution: B.

the final period cash flow indude the project cash flows, the return of net working capital，and the after-tax sale of fixed capital used in the project. Because Tera is a replacement project, the incremental cash flows must be calculated. In other words, we are concerned with the additional sales and costs derived from new equipment.

- incremental sales = 708,000 − 523,000 = $185,000
- incremental cash expenses = 440,000 − 352,000 = $88,000
- incremental depreciation = 110,667 − 40,000 = $70,667
- incremental project cash flows = $(185,000 − 88,000 − 70,667) \times (1 − 0.40) + 70,667 = \$86,647$
- return of incremental net working capital = $110,000

In the final year, the book value of old machine (if not replaced) = $120,000 − 3 \times 40,000 = 0$.

Similarly, the book value of the new machine (if replaced) $332,000 − 3 \times 110,667 = 0$

- Incremental cash flow from after-tax sale of equipment

$$= (113,000 − 90,000) − 0.40 \left[(113,000 − 90,000) − (0 − 0) \right] = \$13,800$$

- total cash flow in final period = 86,647 + 110,000 + 13,800 = $210,267

2. Solution: C.

In scenario analysis, the analyst simultaneously changes several key variables to generate several different scenarios. Generally, three scenarios are created: (1) worst case, (2) most likely, and (3) optimistic. For the worst case scenario, for example, the analyst will use the slowest growth in sales, highest growth in expenses, and highest discount rate to derive an NPV under the worst of all possible situations. A similar approach is used to generate the optimistic scenario, but the best possible growth in each of the variables is used. The most likely is simply what the analyst thinks are the most reasonable assumptions for the discounted cash flow forecast under normal conditions. Using the different cases, the analyst can assess the risk of the project.

3. Solution: A.

Once the Tera Project is begun, the project will be necessary for continuing operations. This is likely a result of the replacement nature of the project. If the equipment necessary for GigaTech's operations is replaced with newer equipment, abandoning the project is not really an option. Management does have the option of scaling up the project after initiation, which is known as an

expansion option. Management can also wait up to nine months to make a decision on the Tera Project, giving them a timing option (note that this is not one of the answer choices). Finally, the equipment used in the Tera Project can support additional shifts if demand for GigaTech's products temporarily exceeds supply, giving them a flexibility option (specifically a production-flexibility option).

4. Solution: B.

The least common multiple of lives approach requires estimating the least common denominator between two mutually exclusive projects with unequal lives. Since the Zeta and Sigma projects have lives of 3 and 2, the least common multiple is 6. The cash flows must be stated over a 6-year period, repeating the cash flow pattern as often as necessaty (two times for Zeta and three times for Sigma). The cash flows are then discounted to find the net present value (NPV). The project with the highest NPV is selected. The cash flows are as follows:

	Year						
	0	**1**	**2**	**3**	**4**	**5**	**6**
Zeta Project	-360,000	250,000	220,000	190,000			
				-360,000	250,000	220,000	190,000
Total	-360,000	250,000	220,000	-170,000	250,000	220,000	190,000
Sigma Project	-470,000	330,000	390,000				
			-470,000	330,000	390,000		
					-470,000	330,000	390,000
Total	-470,000	330,000	-80,000	330,000	-80,000	330,000	390,000

Before calculating the NPV of each project, the cost of must be restated in nominal terms since cash projections are nominal terms. The nominal cost of capital is equal to 15.0% = (1 +0.1058)(1 + 0.04). The NPV of each project is calculated as follows:

$$NPV_{Zeta} = -360,000 + \frac{250,000}{1.15} + \frac{220,000}{1.15^2} + \frac{-170,000}{1.15^3} + \frac{250,000}{1.15^4} + \frac{220,000}{1.15^5} + \frac{190,000}{1.15^6}$$

$$= 246,425$$

$$NPV_{Sigma} = -470,000 + \frac{330,000}{1.15} + \frac{-80,000}{1.15^2} + \frac{330,000}{1.15^3} + \frac{-80,000}{1.15^4} + \frac{330,000}{1.15^5} + \frac{390,000}{1.15^6}$$

$$= 260,381$$

Since its NPV is greater, GigaTech should select the Sigma project.

5. Solution: C.

The comment sin the memo from GIgaTech's board of directors are both incorrect. Earnings per share (EPS) is not a suitable criteria to evaluate capital budgeting projects. Under capital rationing, a firm selects the projects that increase the value of the firm by the greatest amount (i.e., have the highest NPV) subject to the capital constraints of the firms's budget. It is perfectly possible that projects that increase EPS will not get selected. For example, if a project has an NPV of $80 and increases EPS by $0.50 and a second project has an NPV of $200 but will initially reduce EPS by $0.20, the firm should select the second project (if its capital budget will allow it) since it adds more value. The capital budgeting process should not consider sunk costs (i.e., past costs that do not affect the cash flows of the project) such as costs to find investment projects. The cash flow projections should consider the economic impact increased competition resulting from highly profitable investment projects.

6. Solution: B.

When evaluating potential capital investment projects, discount rate should be adjusted for the risk of the project under consideration. This is frequently accomplished by determining a project beta using this beta in the CAPM security market line quation:

$$r_i = R_F + \beta_i \left[E(R_M) - R_F \right]$$

Project betas can be determined in a number of ways including using proxy firms with operations similar to the project under consideration, estimating an accounting beta, or through cross-sectional regression analysis. Whatever method used to determine the discount rate, it should be clear that the weighted average cost of capital (WACC) is only appropriate for projects with risk similar to the overall firm. If a project is more (less) risky than the overall firm, the discount rate used to evaluate the project should be greater (less) than the firm's WACC.

Case 2: MavsHD (考点：dividends and share repurchase)

1. Solution: C.

Managers at MavsHD want to move toward the target payout ratio over a period of 8 years, which makes the adjustment factor equal to: 1 / 8 = 0.125. The expected dividend increase is given as $250,000, and the increase in earnings can be computed as the difference between expected earnings and earnings from the prior year: 153,000,000 - 145,000,000 = $8,000,000. Plugging each of these figures into the previous formula, the target payout ratio is calculated as:

$$\text{Target payout ratio} = \frac{250,000}{(8,000,000 \times 0.125)} = 0.25 = 25\%$$

2. Solution: C.

Paying a premium price for the shares (i.e., a price higher than the current market price of the stock) will reduce the value of the remaining shareholders' shares. However, this value reduction is actually transferred to the selling shareholders since they receive more than the market value per share for selling their shares.

3. Solution: C.

$$\triangle P = D \times \frac{(1 - T_d)}{(1 - T_{cg})} = 2.25 \times \frac{(1 - 0.15)}{(1 - 0.396)} = 3.17$$

4. Solution: C.

Investors do not like instability in the dividends paid by a company. Any volatility in dividends is seen as a negative sign by investors, and the company's stock price would be punished as a result of varying dividends. According to the bird-in-the-hand theory, investors prefer the assurance of receiving a higher dividend today rather than waiting for returns in the form of capital appreciation. Because of the uncertainty associated with capital appreciation and the relative certainty of dividends, the bird-in-the-hand theory predicts that investors will reward dividend paying companies with a lower cost of equity and, thus, a higher equity value. A repurchase does not provide the same type of assurance since it is an unpredictable and possibly one-time event.

5. Solution: A.

If the company plans on spending $160 million on net investments, then only 60% of the funds need to come from retained earnings. Therefore, MavsHD needs 0.6 x 160 = $96 million in retained earnings. Net income is projected to be $153 million, leaving $57 million (153 - 96) available to pay dividends. Thus, the dividend payout ratio would equal 57 / 153 = 37.3%.

6.   Solution: B.

Under a residual dividend policy, a firm determines the optimal capital budget and then uses retained earnings to fund the optimal capital budget, paying out what is left over to shareholders. Because the amount of distributable earnings is not known in advance and is determined as a function of the capital budget, the dollar dividend paid to shareholders will fluctuate widely from year to year. However, the firm will be able to use internally generated funds to a greater extent when deciding how to fund the optimal capital budget. It is not true; however, that the residual dividend policy will reduce the firm's cost of capital. Investors do not like unpredictable dividends and will penalize the company in the form of a higher required return on equity to compensate for the additional uncertainty related to dividend payments.

Case 3: Aubrey Yacht Manufacturers Case Scenario (考点：Capital structure, dividend policy and corporate governance)

1. Solution: C.

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

Each year, from 2003 to 2007, the company paid out approximately 51–52% of earnings—indicating a constant dividend payout ratio policy.

Year	EPS ($)	DPS ($)	DPS/EPS × 100
2003	4.18	2.17	51.9%
2004	4.52	2.31	51.1%
2005	4.77	2.48	51.9%
2006	5.05	2.58	51.0%
2007	5.18	2.64	50.9%

2. Solution: A.

Compare stable dividend, constant dividend payout, and residual dividend payout policies, and calculate the dividend under each policy.

Aubrey is proposing a stable dividend policy—one that reflects long-run expected earnings.

The adjustment factor= $\dfrac{1}{\text{number of years over which adjustment is to occur}} = 1/5$

Expected dividend=last dividend +increase in earnings*target payout ratio*adjustment factor.

For 2014: Expected dividend=3.42+ (8.05*0.35-3.42)*0.20=$3.30.

3. Solution: A.

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.

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.

Personal relationships, having a past employment history with the firm, and interlocking directorships—all indicate a lack of board independence. Among the current board members, only the Aubreys are/were employees of the firm. Maturin was a childhood friend of Charles and recently returned from a long trip (for the second year in a row); Maturin and Jack have interlocking directorships on their respective boards.

4. Solution: C.

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

Use the equation for the price decrease when the share goes ex-dividend to solve for the marginal tax rate on dividends income.	
Equation 1: Section 2.4.1	$P_W - P_X = D \times \dfrac{1 - T_D}{1 - T_{CG}}$
P_W is the share price with the dividend attached	
P_X is the share price ex-dividend	
D is the dividend	Assumed: $1.00
And T_D and T_{CG} are the marginal tax rates on dividends and capital gains.	T_{CG} given: 23%
If the dividend is assumed to be $1, and the price change is $0.68 of the dividend (as stated by Maturin) (P_W-P_X= 68%)	0.68=1*(1-T_D)/(1-0.23)
Marginal tax rate on dividends	T_D = 47.6%

5. Solution: B.

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.
Staggered boards do allow for continuity of the knowledge and experience in the company, which is essential for good corporate governance.

6. Solution: C.

Explain the Modigliani–Miller propositions concerning capital structure, including the impact of leverage, taxes, financial distress, agency costs, and asymmetric information on a company's cost of equity, cost of capital and optimal capital structure.

1. Determine the cost of equity at the proposed debt level.
According to MM Proposition II, in the presence of taxes
$r_e = r_0 + (r_0 - r_d)\,(1 - t)\,D/E$ (Equation 9)
The company is currently unlevered, so its r0 = 12% (given)
$r_e = 0.12 + (0.12 - 0.05) \times (1 - 0.30) \times 0.25 = 13.2\%$

2. Determine the WACC using the levered cost of equity.
A D/E of 0.25 corresponds to D/V = 0.25/1.25 = 20%.
$r_{WACC} = D/V \times r_d\,(1 - t) + E/V \times r_e$ (Equation 8)

$r_{WACC} = [0.20 \times 0.05 \times (1 - 0.30)] + [0.80 \times 0.132] = 11.3\%$

r_e = Marginal cost of equity capital for levered firm	
r_0 = Cost of equity capital for unlevered firm	
r_d= Marginal Cost of debt, before tax	
t = Corporate tax rate	
D, E, V = market value of debt, equity, and value of firm respectively	
r_{WACC} = weighted average cost of capital for firm	

Case 4: England Case Scenario (考点：Capital structure, dividend policy and corporate governance)

1. Solution: C.

Determine the yearly cash flows of expansion and replacement capital projects, and evaluate how the choice of depreciation method affects those cash flows.

Using Equation 8: after-tax operating cash flow (CF):

$$CF = (sales - cash\ operating\ \exp enses)*(1 - tax\ rate) + depreciation*tax\ rate$$
$$= (3.24 - 1.94 - 0.21)*(1 - 0.32) + 0.21*0.32 = 0.8084$$

2. Solution: B.

Calculate and interpret accounting income and economic income in the context of capital budgeting.

Using Equation 12: economic profit (EP):

$$EP = EBIT*(1 - \text{tax rate}) - WACC*capital$$

Use the real WACC in Exhibit 2: 10.1%.

Find Capital at the beginning of 2013 (i.e., the end of 2012):

Capital = Investment = Capital investment required + Additional working capital.

Capital = 10.36 + 2.20 = 12.56.

Note: The consultant fee is a sunk cost.

Find EP:

$$EP = 0.67*(1 - 0.32) - 0.101*12.56 = -0.813$$

3. Solution: B.

Based on the first phone conversation with Weinberger, the cost of equity for the new division should be implied from OUT. Further, the cost of equity implied from OUT is a nominal rate that will need to be inflation adjusted.

Imply nominal cost of equity from OUT using CAPM (RF = risk-free rate) (data in Exhibit 2):

$$\text{Nominal cost of equity} = R_F + Beta*\text{market premium}$$
$$= 0.025 + 1.80*0.082 = 0.1726$$

Find real cost of equity:

$$\text{real cost of equity} = \frac{1 + \text{nominal cost of equity}}{1 + \text{inflation rate}} - 1$$
$$= \frac{1 + 0.1726}{1 + 0.0078} - 1 = 0.1635$$

4. Solution: B.

OUT's takeover defense seeking an angel investor, who bought a substantial minority stake of its stock, enough to block our hostile takeover bid—is consistent with the White Squire defense.

5. Solution: B.

The after-tax non-operating cash flow is the $12 million inflow less the taxes paid on the capital gains plus the net working capital that is recovered.

Book value of the assets = Initial capital investment – Accumulated depreciation:

9.31=10.36-(5*0.21)

Capital gains taxes: = (12.00-9.31)*0.32=0.8608

Net cash inflow from sale = 12.0 – 0.8608 = 11.13.

The total net working capital investment that will be recovered:

3.84=2.20+0.62+0.43+0.28+0.19+0.12

The after-tax non-operating cash flow:

14.97=11.13+3.84

6. Solution: B.

Find the expected NPV in Exhibit 3:

-2.53=0.25*(-5.21) +0.50*(-3.08) +0.25*1.25

The additional value of the real options is the expected NPV with real options (0.75) less the expected NPV in Exhibit 3: 3.28=0.75-(-2.53)

Case 5: Alertron (考点：Merger and Acquisition)

1. Solution: B.

Ozer's memo states that in an acquisition, Alertron would want to maintain the successful Escarigen brand and operational structure. As a result, the most likely form of integration would be a subsidiary merger in which Escarigen would become a subsidiary of Alertron. Most subsidiary mergers occur when the target has a well-known brand that the acquirer wants to maintain, which is the case here. Note that in a statutory merger, the target company would cease to exist as a separate entity. Since both Alertron and Escarigen are involved in the pharmaceutical industry, the type of merger would be best described as horizontal. The merger would not be vertical as Alertron would not be moving up or down the supply chain.

2. Solution: B.

The potential acquisition of Carideo is described as a stock purchase, which means that Carideo's shareholders would be responsible for paying capital gains taxes on the deal and no taxes would be levied against Carideo at the corporate level. The other answers are incorrect. The potential deal with Escarigen is described as a cash offering.

In most cash offerings, the acquirer borrows money to raise cash for the deal, which would increase the acquirer's financial leverage. In the potential deal with BriscoePharm, shareholders generally only approve asset purchases when the purchase is substantial (greater than 50% of firm assets). In this case, shareholder approval would not be required. In a proxy battle for Dillon Biotech, Alertron would try to have shareholders approve new members of the board of directors to try to gain control of the company. Trying to purchase shares from shareholders individually is a tender offer.

3. Solution: C.

The only pair combination that correctly identifies a pre-offer and post-offer defense, respectively, is a supermajority voting provision, which is a pre-offer defense requiring shareholder approval in excess of a simple majority; and a leveraged recapitalization, which is a post-offer defense where a target borrows money to repurchase its own shares. Pre-offer defenses suggested include poison puts, fair price amendments, restricted voting rights, poison pills, and staggered board elections. The only other post-offer defense suggested was greenmail, which was incorrectly categorized.

4. Solution: C.

First, calculate the value of the combined firm after the merger:

Post-merger value of the combined firm: $V_{AT} = V_A + V_T + S - C$

V_A =$9,000 V_T =$3,120 S = $600

C = $0 because no cash is changing hands

The value of the combined firm is therefore V_{AT} = $9,000 + $3,120 + $600 - 0 = $12,720

Next, to account for the dilution and to find the price per share for the combined firm, P_{AT} divide the post-merger value by the post-merger number of shares outstanding. Since we are told that Alertron would exchange 0.75 shares of its stock for each share of Carideo, the number of new shares issued is:

80 million shares x 0.75 = 60 million new shares

This means the actual value of each share given to Carideo's shareholders is $60.57 and the actual price paid for Carideo is:

$P_T = (N \times P_{AT}) = (60 \times \$60.57) = \$3,634.20$

Carideo's gain in the merger as the target is:

$Gain_T = T_P = P_T - V_T = \$3,634.20 - \$3,120 = \$514.20$

Note that Carideo's gain simply represents the takeover premium in the transaction.

5. Solution: A.

In a cash offer, the acquirer assumes the risk and receives the potential reward from the merger, while the gain to the target shareholders is limited to the takeover premium. In this case, Alertron is comfortable with the estimate of synergies and thinks the estimate may even be conservative. By making a cash offer, the takeover premium realized by Carideo would remain unchanged, with any excess benefit from synergies going to Alertron. Based on its forecasts, Alertron would prefer a cash deal.

However, if the synergies were less than expected, the takeover premium realized by Carideo would still be unchanged with a cash deal, but Alertron's gain may decrease. Since Carideo management believes the estimate of synergies is too high, they would also prefer a cash deal to lock in the gain they realize from the takeover premium.

6. Solution: C.

3 Pre-merger HHI:
$$(0.20\times100)^2 + (0.18\times100)^2 + (0.15\times100)^2 + (0.12\times100)^2 + (0.10\times100)^2 + (0.07\times100)^2 + (0.03\times100)^2 \times 6] = 1,296$$

The post-merger market share of the combined firms would be 15% + 10% = 25%.

$$Post\ merger\ HHI = (0.25\times100)^2 + (0.2\times100)^2 + (0.18\times100)^2 + (0.12\times100)^2 + (0.07\times100)^2 + \left[(0.03\times100)^2 \times 6\right] = 1,596$$

Change in HHI = 1,596 - 1,296 = 300

A post-merger HHI that is between 1,000 and 1,800 indicates a moderately concentrated industry. With a change in an HHI that is greater than 100, there is certainly the potential for an antitrust challenge by regulators.

Case 6: Kazmaier (考点： dividend policy)

1. Solution: A.

Hinesmans comment is correct. Studies have shown, that on average, companies with strong corporate governance systems have higher measures of profitability and generate higher returns for shareholders.

Randalls comment is also correct. The lack of an effective corporate governance system increases risk to an investor, including asset risk, liability risk, financial disclosure risk and strategic policy risk.

2. Solution: A.

According to corporate governance best practice, the audit committee should consist only of independent directors; it should have expertise in financial and accounting matters (for purposes of the exam, at least two members of the committee should have relevant accounting and auditing experience); the internal audit staff for the firm should report directly to the audit committee; and the committee should meet with external auditors at least once annually without management present.

3. Solution: C.

Using a target debt-to-equity ratio of 1:1, the $150 million in capital spending for 20X1 will be financed with $75 million in internal equity and $75 million in debt. The total dividend is the remaining internal equity of $112.5 - $75 = $37.5 million, or $37.5 / 56.25 = $0.67 per share.

4. Solution: B.

FCFE = cash flow from operations - FcInv + net borrowings

20X0: FCFE = 115-43 + 22 = 94

20X1: FCFE = 132 - 150 + 75 = 57

FCFE coverage ratio = FCFE / (dividends + share repurchases)

20X0: 94 / (42.88 + 42) = 1.11

20X1: 57/ (45 + 3) = 1.19

5. Solution: A.

Kazmaier received a score of 25% because it was in compliance with global best practice with respect to only one of the four criteria.

Criterion 1:	Global best practice recommends that three-quarters (75%) of the board members be independent. Of the	Kazmaier fails this criterion.

	nine total board members, only five are independent.	
Criterion 2:	Global best practice recommends that the Chairman of the Board be independent. Since Kazmaiers Chairman is also the CEO.	Kazmaier fails this criterion.
Criterion 3:	Global best practice recommends that the entire board of directors stand for reelection annually. Since it appears that Kazmaier has staggered board elections.	Kazmaier fails this criterion
Criterion 4:	Global best practice requires independent board members to meet in separate sessions at least annually. Although quarterly meetings between independent directors are preferable.	Kazmaier passes this criterion

6. Solution: C.

Nagys three rationales all correctly describe common advantages of share repurchases.

Case 7: Stable Dividend Policy

Solution: A.

The estimated dividend per share is US$0.68.

Previous DPS= US$0.60

Expected EPS= US$5

Target payout ratio =0.25

Five year adjustment factor=1/5=0.2

Expected dividend=previous dividend+ (Expected earnings × target payout ratio- Previous

dividend) × adjustment factor

=0.6 + ($4×0.25-0.6) ×0.2

=0.6+0.08= 0.68

6. Equity

Case 1: Western Investments Analytics Case Scenario(考点：Return Concepts)

1. Solution: B.

First, calculate the unlevered beta of the benchmark (Triway Textiles):

> First, calculate the unlevered beta of the benchmark (Triway Textiles):
>
> $$\beta_u = \left[\frac{1}{1+\left(\frac{D}{E}\right)}\right]\beta_E = \left[\frac{1}{1.38}\right]0.75 = 0.54348$$
>
> Then calculate the equity beta for Hattie's Apparel as:
>
> $$\beta'_E = \left[1+\left(\frac{D'}{E'}\right)\right]\beta_U = 1.45\times 0.54348 = 0.78805$$

2. Solution: C.

The Fama–French estimate of the required return on equity is calculated as:

$$r_i = R_F + \beta_i^{mkt}RMRF + \beta_i^{size}SMB + \beta_i^{value}HML$$

For the given information we have:

$$r_i = 0.01 + 0.82\times 0.08 + 0.75\times 0.02 + 0.15\times 0.04 = 0.09660 = 9.7\%$$

3. Solution: C.

Hilliard prefers to use the DDM-based estimate for return on equity in the WACC.

$$WACC = \frac{MVD}{MVD+MVCE}r_d\left(1-\text{Tax rate}\right) + \frac{MVCE}{MVD+MVCE}r$$

$\frac{MVD}{MVD+MVCE}$ Is the market based weight of debt for the firm and $\frac{MVCE}{MVD+MVCE}$ is the weight of

equity. In this case, with a debt-to-equity ratio of 45%, Hattie's Apparel has a weight of debt of 0.31034 (calculated as 0.45/1.45). The weight of equity is 0.68966 (calculated as 1 − 0.31034). The pretax cost of debt is 9%, and the tax rate is 32%. The cost of equity is calculated using the Gordon model as:

$$\frac{2.75\times 1.03}{45} + 0.03 = 0.9294.$$

The WACC is: [0.31034 × 0.09 × (1 − 0.32)] + [0.68966 × 0.09294] = 0.08309 = 8.3%.

4. Solution: A.

Colbaugh's first recommendation pertains to the use of the Pastor–Stambaugh model, which adds a fourth factor to the FFM—compensation for the degree of liquidity of an equity investment.

5. Solution: C.

Colbaugh suggests comparing Hattie's PEG to Triway's PEG. PEG is useful but must be used with care: PEG assumes a linear relationship between P/E and growth, does not factor in differences in risk, and does not account for differences in the duration of growth. Further, per computations shown below, Hattie's Apparel is more attractive than Triway Textiles based on PEG, not less attractive.

	Dividends	Payout Ratio	EPS	Price	P/E	Growth	PEG
Hattie's Apparel	2.75	0.40	2.75/0.40 = 6.875	45	45/6.875 = 6.54545	3%	6.54545/3 = 2.2
Triway Textiles	8.45	0.55	8.45/0.55 = 15.36364	115.48	115.48/15.36364 = 7.51645	2.5%	7.51645/2.5 = 3.0

6. Solution: A.

Colbaugh's last suggestion is to apply Blume's adjustment to the published CAPM equity beta.

Blume's adjusted beta = (2/3) × (Unadjusted beta) + (1/3) × (1.0)

Triway's beta with Blume's adjustment = (2/3) × (0.75) + (1/3) × (1.0) = 0.8333

Case 2: Arnaud Aims (考点：Market-based Valuation)

1. Solution: B.

Normalizing EPS using the method of average EPS is accomplished by averaging the EPS over the six-year period from 2010-2015:

EPS (normalized) - (1.90 + 1.65 + 0.99 + 1.35 + 0.77 + 1.04) / 6 = 1.283. The P/E ratio based on this normalized EPS is 26.5 / 1.283 = 20.649.

2. Solution: A.

Normalizing EPS (for 2016) using the method of average return on equity is accomplished by (1) averaging the ROE over the six-year period from 2010-2015, and then (2) multiplying the average ROE times the 2015 BVPS. ROE(average) = (0.178 + 0.178 + 0.122 + 0.177 + 0.114 + 0.160) / 6 = 0.155. EPS(normalized) = 0.155(10.66) = 1.652. The P/E ratio based on this normalized EPS is 26.5 / 1.652 = 16.04.

3. Solution: A.

Book values are more likely to be positive than EPS. Thus, the P/B ratio suffers less often from the problem where P/E ratios are not meaningful because of a negative EPS. The other two advantages given are actually disadvantages associated with using P/B ratios.

4. Solution: A.

Aims is correct about both ratios. For example, let's take the trailing P/E ratio, which is P0/E0. Multiplying by the net profit margin results in P0/E0 × E0/S0 = P0/S0. The justified P/E is (1 - b)(1 + g) / (r - g), the justified P/S is (E0/S0) (1 - b)(l + g) / (r - g). Multiplying the leading P/E ratio by the ROE results in P0/E1 × E1/B0 = P0/B0. If the justified P/E is (1 - b) / (r - g), the justified P/B is ROE(l - b) / (r - g). This becomes (ROE - b × ROE) / (r - g). Since b × ROE = g (from sustainable growth equation), the equation becomes (ROE - g) / (r - g).

5. Solution: A.

Both criteria are poorly applied by the associate. Generally, a lower PEG ratio is considered desirable, not a higher one. The difference in the trailing and leading P/E ratios could be due to transitory elements in the current year's income in the denominator of the trailing P/E. In a constant growth model (admittedly a strong assumption), the leading P/E will naturally be smaller than the trailing P/E because earnings are growing by g.

6. Solution: C.

Comment 1 about EBITDA ratios is incorrect. EBITDA is a pre-interest variable, so it is a flow available to all suppliers of capital, not just common shareholders. The comment about dividend yields is reasonable.

Case 3: Mendosa (考点：综合)

1. Solution: C.

First, use SRNC's data to find its unlevered equity beta. Next, use SRNC's unlevered beta and PRBI's debt ratio to find PRBI's equity beta. The formulas are as follows:

$$Unlevered\ Beta: b_u = \left[\frac{1}{1+\dfrac{D}{E}}\right]b_E;$$

$$Relevered\ Beta: b_E = \left[1+\frac{D'}{E'}\right]b_u$$

$$SRNCs\ debt\ ratio\ of\ 0.60\ means\ \frac{D}{E} = \frac{0.60}{0.40}$$

$$Unlevered\ Beta: b_u = \left[\frac{1}{1+\dfrac{0.60}{0.40}}\right]1.60 = 0.64;$$

$$PRBIs\ debt\ ratio\ of\ 0.20\ means\ \frac{D'}{E'} = \frac{0.20}{0.80};$$

$$Relevered\ Beta: b_E = \left[1+\frac{0.20}{0.80}\right]0.64 = 0.80$$

2. Solution: C.

Using the PVGO and assuming that the company has no positive net present value (NPV) projects, the PVGO Model is:

$$V_0 = \frac{E_1}{r} + PVGO = \$70 = \frac{\$5.33 \times 1.15}{0.124} + PVGO$$

$70 = $49.43 + PVGO

PVGO = $70 - $49.43 = $20.57

3. Solution: B.

Using the H-model:

$$H\ Model: V_0 = \frac{D_0(1+g_L) + D_0 H(g_S - g_L)}{r - g_L}$$

$$D_0 = \$5.33 \times 0.60 = \$3.20;$$

H = 1/2 of the life of high-growth period = 10/2 = 5 years

$$H\ Model: V_0 = \frac{\$3.20 \times 1.04 + \$3.20 \times 5 \times (0.15 - 0.04)}{0.124 - 0.040} = \frac{\$3.33 + \$1.76}{0.084} = \$60.60$$

4. Solution: C.

Raman is most accurate with respect to his comments on the CAPM. In portfolios, the idiosyncratic risk of individual securities tends to offset against each other leaving largely beta (market) risk. For individual securities, idiosyncratic risk can overwhelm market risk and, in that case, beta may be a poor predictor of future average return. Thus the analyst needs to have multiple tools available.

5. Solution: B.

Statement 3 by Raman is most accurate. The residual income model, also called the excess earnings method, does not have the same weakness as the FCFE approach, because it is an estimate of the profit of the company after deducting the cost of all capital: debt and equity. Further, it makes no assumptions about future earnings and dividend growth.

6. Solution: C.

Using a multi-stage residual income model and the data in Exhibit 3:

Equity charge = Equity capital × Cost of equity capital

= 20.97 × 0.124 = $2.60 million

Residual income of the more recent year = Net income − Equity charge

= 8.00 − 2.60 = $5.40 million

Raman's assumed growth rate during the forecast period of five years = 15%

Annual residual income during the no growth period (after Year 5) = $5.40 × (1.15)^5 = \$10.86$

Present value (PV) of the residual income from perpetual period, as at T = 5:

($10.86/0.124)=$87.58

PV of the perpetual period residual income at T = 0: $87.58/ (1.124)^5 = \$48.82$

Case 4: TCC (考点： Market-Based Valuation, Free Cash Flow Valuation)

1. Solution: B.

The comparable transactions method uses details from recent takeover transactions for comparable companies to make direct estimates of the target company's takeover value. However it is not necessary to separately estimate a takeover premium as this is already included in the multiples determined from the comparable transactions.

2. Solution: B.

The fact that the products are designed to meet specific customer requirements and require extensive set-up and trainings costs would make customer switching costs high which reduces the threat of new entrants. Due to the advanced technology and high degree of product reliability required customers would have low bargaining power. Module manufacturing involves small production runs, low profit margins and should not be attractive to this high profit margin specialized industry.

3. Solution: A.

$$\frac{P_0}{S_0} = \frac{(E_0/S_0)(1-b)(1+g)}{r-g}$$

E_0/S_0 = the business's long-term profit margin = 8.0%

$(1-b)$ = the projected payout ratio = 0.20

g = the long-run earnings growth rate

r = required rate of return

$$\frac{P_0}{S_0} = \frac{(0.08)(1-0.20)(1+0.048)}{0.13-0.048} = 0.82$$

4. Solution: C.

Real required rate of return = Country return + Industry adjustment + Size adjustment − Leverage adjustment

Real country return	8.60%
+ Industry	1.60%
+ Size	1.45%
− Leverage	−0.85%
Required rate of return	10.80%

5. Solution: B.

$$V_0 = \frac{FCFE_0(1+g_{real})}{r_{real} - g_{real}}$$

Real required rate of return as given = 11.50%

$FCFE_0$ = FCFF − Into (1 − Tax rate) + Net borrowing

$$= 84 - 36(1 - 0.40) + 52$$

$$= 114.4$$

$$V_0 = \frac{FCFE_0(1+g_{real})}{r_{real} - g_{real}} = \frac{114.4(1+0.03)}{0.115 - 0.03} = 1,386$$

6. Solution: A.

Because of the three different growth periods, it is necessary to use the three-stage FCFF model and calculate the FCFF for each of Years 1 to 4 and a terminal value at the end of Year 4.

Year	1	2	3	4	5
Growth rate	15%	15%	10%	10%	3% thereafter
FCFF	467.25 × 1.15= 537	618	680	748	
Present Value at WACC	537/1.096 = 490	514	516	518	
Terminal value at T = 4				11,673	
PV of TV				8,089	

$$Terminal\ value\ at\ T = 4 : V_4 = \frac{FCFF_4(1+g)}{WACC - g} = \frac{748 \times 1.03}{0.096 - 0.03} = 11,673$$

$$PV\ of\ TV = \frac{11,673}{(1+0.096)^4} = 8,089$$

$$PV_0 = 490 + 514 + 516 + 518 + 8,089 = 10,127$$

Case 5: Angela Green(考点：Industry and Company Analysis,)

1. Solution: C.

Economies of scale are a situation in which average costs decrease with increasing sales volume. Chrome's gross margins have been increasing with net sales. Gross margins that increase with sales levels provide evidence of economies of scale, assuming that higher levels of sales reflect increased unit sales. Gross margin more directly reflects the cost of sales than profit margin.

2. Solution: A.

A bottom-up approach for developing inputs to equity valuation models begins at the level of the individual company or a unit within the company. By modeling net sales using the average annual growth rate, Candidate A is using a bottom-up approach. Both Candidate B and Candidate C are using a top-down approach, which begins at the level of the overall economy.

3. Solution: B.

A top-down approach usually begins at the level of the overall economy. Candidate B assumes industry sales will grow at the same rate as nominal GDP but that Chrome will have a 2 percentage points decline in market share. Candidate B is not using any elements of a bottom-up approach; therefore, a hybrid approach is not being employed.

4. Solution: C.

Candidate C assumes that the 2013 gross margin will increase by 20 bps from 2012 and that net sales will grow at 50 bps slower than nominal GDP (nominal GDP = Real GDP + Inflation = 1.6% + 2.0% = 3.6%). Accordingly, the 2013 forecasted costs of sales are $19.27 million, rounded to $19.3 million.

Metric	Calculation	Result
2013 gross margin = 2012 gm + 20 bps	$35.1/$53.9 = 65.12% + 0.20% =	65.32%
2013 CoS/net sales = 100% − gross margin	100% − 65.32% =	34.68%
2013 net sales = 2012 net sales × (1 + Nominal GDP − 0.50%)	$53.9 million × (1 + 0.036 − 0.005) = $53.9 million × 1.031 =	$55.57 million
2013 cost of sales = 2013 net sales × Cost of sales/net sales	$55.57 × 34.68% =	$19.27 million

5. Solution: B.

Candidate A assumes that the 2013 SG&A/net sales ratio will be the same as the average SG&A/net sales ratio over the 2010-2012 time period, and that net sales will grow at the annual

average growth rate in net sales over the 2010-2012 time period. Accordingly, the 2013 forecasted selling, general, and administrative expenses are $25.5 million.

Metric	Calculation	Result
Average SG&A/net sales, 2010–2012*	(41.24% + 44.55% + 46.57%)/3 =	44.12%
Average annual growth sales in net sales, 2010–2012**	(7.91% + 6.73%)/2 =	7.32%
2013 net sales = 2012 net sales × (1 + Average annual growth rate in net sales)	$53.9 million × 1.0732 =	$57.85 million
2013 SG&A = 2013 net sales × Average SG&A/net sales	$57.85 million × 44.12% =	$25.52 million

*SG&A/net sales ratios are calculated as follows:

Metric	2010	2011	2012
Net sales	46.8	50.5	53.9
SG&A expenses	10.3	22.5	25.1
SG&A-to-sales ratio	41.24%	44.59%	46.57%

**Growth rate in net sales is calculated as follows:

Years	Calculation
2011	($50.5/$46.8)-1=7.91%
2012	($53.9/$50.5)-1=6.73%

6. **Solution: A.**

In forecasting financing costs such as interest expense, the debt/ equity structure of a company is a key determinant. Accordingly, a method that recognizes the relationship between the income statement account (interest expense) and the balance sheet account (debt) would be a preferable method for forecasting interest expense when compared with methods that forecast based solely on the income statement account. By using the effective interest rate (interest expense divided by average gross debt), Candidate A is taking the debt/ equity structure into account whereas Candidate B (who forecasts 2013 interest expense to be the same as 2012 interest expense) and Candidate C (who forecasts 2013 interest expense to be the same as the 2010-2012 average interest expense) are not taking the balance sheet into consideration.

Case 6: Metev(考点：Private Company Valuation)

1.   Solution: A.

Using data from Exhibit 3, the cost of equity (build-up method) = Risk-free rate + Equity risk premium + Small stock risk premium + Industry risk premium + Company-specific risk adjustment.

Cost of equity = 3.9 + 6.0 + 2.5 − 1.0 + 1.5 = 12.9%

WACC = Pre-tax cost of debt (1 − T) × (Debt weight) + Cost of equity × (Equity weight)

WACC = 10.0 × (1 − 0.25) × (0.3) + 12.9 × (0.7) = 2.25 + 9.03 = 11.28%

2.   Solution: A.

Capitalization rate = (WACC − Long-term growth rate) = 11.0% − 5.0% = 6.0%

3.   Solution: A.

Nenkov is incorrect with respect to his first comment because the capitalized cash flow method is rarely used for the valuation of public companies and it is more appropriate for valuing a private company such as RRBL. Nenkov's second comment is correct because the excess earnings method involves estimating the earnings remaining after deducting the amounts that reflect the required returns to working capital and tangible assets. The residual amount of earnings (i.e., the excess earnings) is capitalized to obtain an estimate of the value of intangible assets. Therefore, Nenkov's second comment is correct.

4.   Solution: A.

Adjusted EV/EBITDA multiple = 7.2 × (1.25) = 9.0

EV = EBITDA2013 × Adjusted EV/EBITDA = 105.1 × 9.0 = 945.9

Value of equity = EV + Cash and short-term investments − Long-term debt = 945.9 + 50.0 − 30.0 = 965.9

5.   Solution: A.

Statement 1 is correct because EBITDA is a pre-interest earnings figure, in contrast to earnings per share, which is a post-interest figure. Thus the differences in financial leverage do not affect EBITDA. Statement 2 is incorrect because EBITDA overestimates cash flow from operations if working capital is growing. Therefore, only Statement 1 is correct.

6.   Solution: A.

Discount for lack of control = 1 − [1/ (1+ Control premium)] = 1 − [1/ (1.30)] = 23.1%

Case 7: GreenSnacks (考点：Discounted Dividend Valuation, Residual Income Valuation)

1. Solution: C.

GNSK is in the growth stage because it is expanding rapidly and enjoying the benefits of the health food market, which is also growing rapidly. GNSK is also experiencing high and growing profit margins as well as abnormally high earnings per share growth, which are all indicative of a company in its growth phase.

2. Solution: A.

The H-model that Tanner decides to use is a variant of the two-stage dividend discount model. It assumes growth begins at a high rate and declines linearly throughout the super-normal growth period until it reaches a normal rate at the end. In the case of GNSK, the H-model is appropriate for estimating the required return because Tanner expects extraordinary earnings growth of 20% next year with the rate of growth diminishing over time to match industry conditions in Year 6.

$$r = \frac{D_0}{P_0}\left[(1+g_L) + H(g_s - g_L)\right] + g_L$$

H = Half-life in years of the super-normal growth rate = 5 x 0.5 = 2.5

D_0 = 2.45 × 0.25 = $0.6125

g_L = Sustainable growth rate for the industry = ROE × (1-payout) = 0.128×(1 − 0.65) = 0.0448 or 4.48%

g_s = Short-term growth rate of GNSK = 0.20

$$r = \frac{0.6125}{21.875}\left[(1+0.0448) + 2.5(0.20 - 0.0448)\right] + 0.0448$$

= (0.028) {(1.0448) + 0.388} +0.0448

= 0.08492 or 8.5%

3. Solution: C.

$$V_0 = \frac{D_0(1+g)}{r-g}$$

Rearranging:

$$\frac{D_0}{P_0} = \frac{r-g}{1+g}$$

Let D_0/P_0 = d and rewrite the equation:

$$g = \frac{r-d}{1+d}$$

Using the industry data in Exhibit 1:

$$g = \frac{0.11 - 0.037}{1 + 0.037} = 0.0704 \, or \, 7.0\%$$

Alternatively:

0.037 = (0.11 − g)/ (1 + g)

0.037(1 + g) + g = 0.11

0.037 + 0.037g + g = 0.11

1.037g = 0.11 − 0.037

g = 0.073 / 1.037 = 0.0704 =~ 7.0%

4. Solution: B.

$V_0 = D_1/(r − g)$ where $D_1 = D_0 (1 + g)$.

$$V_0 = \frac{2.48(1 - 0.2)}{0.074 - (-0.02)} = \frac{2.43}{0.094} = \$25.85$$

5. Solution: B.

Baldridge's statement is least accurate. The residual income approach uses the book value of equity, and it requires that the clean surplus relationship holds.

Case 8: Thorngate Ventures (考点：**Free Cash Flow valuation)**

1. Solution: C.

Statement 1: McDonnell is correct. Private firms are usually smaller than public firms

and, thus, thought to be riskier. Accordingly, private firms are usually assigned higher risk premiums and required returns than public firms. The lack of access to liquid public equity markets can also limit a private firm's growth.

Statement 2: McDonnell is correct that small private firms may not be able to attract as many qualified applicants for top positions as public firms. This may reduce the depth of management, slow growth, and increase risk at private firms. She is, however, incorrect that private firm managers and investors have a shorter-term view. Public firm shareholders often focus on short-term measures such as quarterly earnings and the consistency of such. Public management may therefore take a shorter-term view than they otherwise would. So it is private firms that should be able to take a longer-term view.

Furthermore, in most private firms, management has substantial equity ownership. In this case, external shareholders cannot exert as much control, and the firm may be able to take a longer-term perspective.

2. Solution: C.

McDonnell and Lutge will use the investment value of Albion Biotechnology to determine what the firm is worth to Thorngate. Investment value is the value to a specific buyer and may be different for each investor due to different cash flow estimates, perceived firm risk, discount rates, financing costs, and synergies that lead to decreased costs.

Market value is frequently used in real estate and other real asset appraisals where the purchase will be levered. Intrinsic value is the value that should be the market value once other investors arrive at this "true" value.

McDonnell and Lutge are determining the firm's value to Thorngate. The firm is not publicly traded so there is no market for its shares at the present time.

Furthermore, combining Albion with Thorngate's current pharmaceutical firm would result in advances that no pharmaceutical competitor could match. The synergies appear to be unavailable to other potential buyers (i.e., the value that McDonnell and Lutge will determine is specific to Thorngate and is not a value determined in a market of many buyers and sellers).

3. Solution: A.

In a strategic transaction, a firm is acquired based in part on the synergies it brings to the acquirer.

A financial transaction occurs when there are no synergies. The previous suitor of Balanced, a competitor in the same industry, was a strategic buyer and could realize the synergistic cost savings of $1,200,000.

Thorngate currently does not own a manufacturing firm, so it would be a financial buyer. Thorngate will not be able to realize any synergistic cost savings, so these are not included in the free cash flow to the firm (FCFF) estimates in the following tables.

The calculations are as follows.

Proforma Income Statement	
Revenues	$23,540,000
Cost of goods sold	$17,655,000
Gross profit	$5,885,000
SG&A expenses	$5,400,000
Pro forma EBITDA	$485,000
Depreciation and amortization	$235,400
Pro forma EBIT	$249,600
Pro forma taxes on EBIT	$74,880
Operating income after tax	$174,720

Adjustments to Obtain FCFF	
Plus: Depreciation and amortization	$235,400
Minus: Capital expenditures	$297,000
Minus: Increase in working capital	$231,000
FCFF	-$117,880

The following provides a line by line explanation for the above calculations.

Pro forma Income Statement	Explanation
Revenues	Current revenues times the growth rate: $22,000,000 \times (1.07)$
Cost of goods sold	Revenues times one minus the gross profit margin: $23,540,000 \times (1 - 0.25)$
Gross profit	Revenues times the gross profit margin: $23,540,000 \times 0.25$
SG&A expenses	Given in the question
Pro forma EBITDA	Gross profit minus SG&A expenses:

	$5,885,000-$5,400,000
Depreciation and amortization	Revenues times the given depreciation expense: $23,540,000 × 0.01
Pro forma EBIT	EBITDA minus depreciation and amortization: $485,000 - $235,400
Pro forma taxes on EBIT	EBIT times tax rate: $249,600 × 0.30
Operating income after tax	EBIT minus taxes: $249,600 - $74,880
Adjustments to Obtain FCFF	
Plus: Depreciation and amortization	Add back noncash charges from above
Minus: Capital expenditures	Expenditures cover depreciation and increase with revenues: $235,400 + 0.04 × ($23,540,000 - $22,000,000)
Minus: Increase in working capital	The working capital will increase as revenues increase 0.15 × ($23,540,000 - $22,000,000)
FCFF	Operating income net of the adjustments above
(Study Session 11, LOS 34.e)	

4. Solution: A.

The free cash flow method can accommodate multiple stage growth assumptions and is the most appropriate. The firm's growth is expected to slow considerably in the years ahead, so the constant growth assumption of the capitalized cash flow method would be inappropriate. The capitalized cash flow method is a single-stage model.

The excess earnings method is useful when there are intangible assets to value, but that does not appear to be a concern in the valuation of Balanced. The firm's assets appear to be largely tangible (consisting of equipment and the factory).

5. Solution: B.

Lutge is using the guideline transactions method (GTM) because his database uses the price multiples from the sale of entire public and private companies. The interest in Jensen is a noncontrolling equity interest, so a discount for lack of control (DLOC) will be applied to its valuation. A discount for lack of marketability (DLOM) will also be applied because the Jensen

interest cannot be easily sold.

The DLOC is backed out of the control premium.

The total discount includes the discount for lack of marketability (DLOM).

Total discount = 1 - [(1 - DLOC)(l - DLOM)]

Total discount = 1 - [(1 - 0.1575)(1 - 0.24)] = 36.0%

6. **Solution: A.**

Statement 1: McDonnell is correct. Using data from the smallest cap segment of public equity to get the size premium may include a distress premium that is not applicable to a healthy private firm such as Jensen. If so, the estimated size premium will be too large, resulting in a discount rate that is too high and an undervaluation of the Jensen equity interest.

Statement 2: McDonnell is correct. Using the CAPM and estimating beta from public firm data may not be appropriate for private firms that have little probability of going public or being acquired by a public firm. In the build-up method, an industry risk premium is added to the risk-free rate along with an equity risk premium, the small stock premium, and a company-specific risk premium.

Case 9: Yummy Doughnuts (考点：**Residual Income Valuation)**

1. Solution: C.

A decrease in the value of available-for-sale securities that bypasses the income statement would artificially increase net income and, consequently, ROE. Book value is unaffected as the decrease is accounted for in the OCI section of shareholders' equity.

2. Solution: C.

$$WACC = \left(\frac{MVD}{MVD + MVCE} \right) \times \left[r_d \left(1 - tax\ rate \right) \right] + \left(\frac{MVD}{MVD + MVCE} \right)$$

r_d= debt coupon given as 7.0%

tax rate = 40% (given in Exhibit 1)

r_e = equity cost = 0.15 (given in Exhibit 2)

MVD = market value of debt = book value of debt for YD = 12

MVCE = market value of common equity = $15.50 x 18.6 = $288.3

3. Solution: B.

$WACC = WACC x capital = 0.12 x 200 = 24

EVA = NOPAT - $WACC = 42 - 24 = 18

4. Solution: B.

$V_0 = B_0 + [(ROE-r) * B_0] / (r-g)$

book value = equity / total shares = 131 / 18.6 = 7.04 (from Exhibit 1)

r = cost of equity =0.15 (given in Exhibit 2)

ROE = 0.17 (given in Exhibit 2)

g = 0.10 (given in Exhibit 2)

V_0 = 7.04 + [(0.17 - 0.15) * 7.04] / (0.15 - 0.10) = 9.86

5. Solution: A.

It is difficult for a company to maintain a high ROE because of competition. The persistence factor will be lower for those companies. A company that has a low dividend payout has greater growth opportunities than a company with a high dividend payout. The greater growth opportunities should support a higher persistence factor.

6. Solution: C.

Statement 1 is correct. The multistage residual income model uses continuing residual income to

denote the long-run residual income. Based on reversion to the mean, and increasing competition for YD, continuing residual income would be expected to decline to zero over time. Statement 2 is correct. Based on the residual income model formula, $V_0 = B_0 + (ROE - r) * B_0 / (r — g)$. If $ROE = r$, then $V_0 = B_0$.

Case 10: Valuation Strategies Case Scenario (考点：Residual Income Valuation)

1. Solution: B.

B is correct. Chance's statement is the most accurate. When cash flows are negative in the analyst's comfortable forecast time horizon, the RI model is most appropriate. Residual income is sometimes called economic profit because it estimates the company's profit after deducting the cost of all capital. The RI model is less sensitive to estimates of terminal value than discounted dividend or cash flow models.

A is incorrect. Tinker is incorrect: Residual income is sometimes called economic profit because it is an estimate of the profit of the company after deducting the cost of all capital.

C is incorrect. Evers is incorrect: The residual income model is less sensitive to estimates of terminal value than discounted dividend or cash flow models.

2. Solution: C.

C is correct. Calculate the value of THA using the single-stage residual income valuation formula:

$$V_0 = B_0 + (ROE - r)/(r - g) \times B_0$$

where

V_0 = intrinsic value

B_0 = book value

ROE = return on equity

r = cost of equity (i.e., required return on equity)

g = long-term growth rate of residual income

$$V_0 = 49 + (0.12 - 0.105)/(0.105 - 0.055) \times 49 = 63.7$$

A is incorrect. This is the book value. Also, this may be the result if one errs by using g in the numerator instead of r and ROE in the denominator instead of r.

B is incorrect. It is the value using the single-stage Gordon growth model, which is not appropriate given the instructions.

$$V_0 = D_1/(r - g) = 3.00/(0.105 - 0.055) = 60.00$$

3. Solution: A.

A is correct. Use the single-stage Gordon growth model, $P_0 = D_1/(r - g)$, and apply the current market price provided by Filo and the information in Exhibit 1 to solve for g as shown:

P0 = current price

D1 = expected dividend in one year

r = cost of equity (i.e., required rate of return on equity)

g = sustainable dividend growth rate

P0 = D1/(r – g), solving for g: g = r – (D1/P0) = 0.105 – (3/91) = 0.084

B is incorrect. The error is in using the ROE of 0.12 in the denominator instead of r of 0.105.

P0 = D1/(r – g), solving for g: g = r – (D1/P0) = 0.12 – (3/91) = 0.087

C is incorrect. It uses the model with D1 as the current dividend D0:

P0 = [D0(1 + g)]/(k – g), solving for g: g = (P0k – D0)/(D0 + P0) = (91 × 0.12 – 3)/(3 + 91) = 0.084, where k = ROE

4. **Solution: C.**

C is correct. RSTU's required return using the Fama–French model is 6.52%, as shown in the following table:

	Factor Sensitivity			Risk Premium			Required Return = Sum of (Sensitivity × Premium) + Rf					
	Mkt	Size	Value	Mkt	Size	Value	FS × RP Mkt	FS × RP Size	FS × RP Value	Sub Total	Rf	**Total**
RSTU	0.90	(0.44)	0.70	4.10	2.00	2.30	3.69	(0.88)	1.61	4.42	2.10	**6.52**

A is incorrect. It omits adding the risk-free rate.

B is incorrect. It includes the liquidity factor, which is not used in Fama–French: (0.02 × 0.02) + 6.52 = 6.56.

5. **Solution: B.**

B is correct. Tinker's response is most accurate. Although the PEG ratio does reflect differences in growth between companies, it does not factor in differences in risk. Risk is an important determinant of P/E. The relationship between P/E and growth rate is not linear. Because duration of growth is not reflected in the PEG ratio, longer-term growth forecasts, not shorter-term ones, are recommended.

A is incorrect. Evers is incorrect: the relationship between P/E and growth rate is not linear.

C is incorrect. Chance is incorrect: because duration of growth is not reflected in the PEG, longer-, not shorter-, term growth forecasts are recommended.

6. Solution: A.

A is correct. The forecasted annualized percentage return is 20.0, calculated as follows:

Determine current price: Current P/E = 15.1, and EPS = 2.69

P/E × EPS = 15.1 × 2.69 = 40.62: current price

Forecast forward EPS (EPS3) in two years: EPS0 = 2.69, and g = 0.077

EPS3 = EPS0 × $(1 + g)^3$ = 3.36: EPS3

Converge to industry P/E: Forward P/E = 17.4, and EPS3 = 3.36

P/E × EPS3= 17.4 × 3.36 = 58.46: price in 2 years

Return calculation:

(Ph/P0)0.5 − 1 = (58.46/40.62)0.5 − 1 = (1.4392)0.5 − 1 = 0.1997 or 19.97%

B is incorrect. It uses the forecasted trailing EPS (or EPS2), thus calculating the wrong future price of $66.99.

Determine current price: Current P/E = 15.1, and EPS = 2.69

P/E × EPS = 15.1 × 2.69 = 40.62: current price

Forecast trailing EPS (EPS2) in two years: EPS0 = 2.69, and g = 0.077

EPS2 = EPS0 × $(1 + g)^2$ = 3.12: EPS2

Converge to Industry P/E: Forward P/E = 17.4, and EPS2 = 3.12

P/E × EPS2 = 17.4 × 3.12 = 54.29: price in 2 years

Return Calculation:

(Ph/P0)0.5 − 1 = (54.29/40.62)0.5 − 1 = (1.3365)0.5 − 1 = 0.1561 or 15.61%

C is incorrect. It finds the correct holding period return for two years of 0.4392 then divides by two to get 21.96 instead of discounting properly: [(58.46/40.62) − 1]/2

Case 11: Wadgett Manufacturing Case Scenario (考点：Free Cash Flow valuation)

1. Solution: C.

C is correct. Covey's statement is based on the idea that a firm's stock price increases if it is the target of an acquisition (i.e., a control premium). Consequently, when the acquisition failed with no apparent future threat of a takeover, the stock price decreases as the control premium vanishes.

B is incorrect. The subsidiary of a conglomerate generally has a value that is below its stand-alone value due to a conglomerate discount.

A is incorrect. Pairs trading is a relative value strategy that does not consider the actual intrinsic value of a given firm.

2. Solution: A.

A is correct. Cash flow from operations (CFO) already reflects changes in working capital items, therefore Paschel's first comment is correct. EBITDA has the non-cash charges of depreciation and amortization added back, so Covey's statement is incorrect, not all non-cash charges will need to be added back. Net borrowing is added back for FCFE not FCFF, so Paschel's second statement is incorrect.

B is incorrect. Depreciation has already been added back to EBITDA, though there may be other items that still need to be added back.

C is incorrect. Adjusting for net borrowing is not necessary for FCFF (just FCFE).

3. Solution: C.

C is correct. FCFF is preferred over FCFE when a company is leveraged and expecting a change in capital structure. FCFF growth will reflect fundamentals more clearly because FCFE growth will reflect fluctuating amounts of net borrowing. Second, in a forward-looking context, the required return on equity might be expected to be more sensitive to changes in financial leverage than changes in the WACC.

A is incorrect. Statement 1 suggests that FCFE should be used, but this choice is inappropriate given the already levered balance sheet and coming increase in debt capital.

B is incorrect. Statement 3 suggests that the required return to equity should apply to both FCFE and FCFF, yet WACC is the proper discount rate to use in the FCFF method.

4.   Solution: C.

C is correct. First, use the CAPM to determine the required rate of return, r, then use the single-stage FCFE discount model to calculate the intrinsic value per share as follows:

$r = E(R_i) = R_f + \beta[E(R_m) - R_f] = 0.012 + 1.4(0.075) = 0.117$

where r is the required return, R_f is the risk-free rate, and $[E(R_m) - R_f]$ is the equity risk premium.

$V_0 = FCFE_0(1+g)/(r-g) = 1.38 \times 1.08/(0.117 - 0.08) = 40.28$

where V_0 is intrinsic value, g is the long-term growth in FCFE, and r is the required return.

A is incorrect. The error is in omitting incrementing $FCFE_0$ by $1 + g$.

$V_0 = FCFE_0/(r-g) = 1.38/(0.117 - 0.08) = 37.3$

B is incorrect. The error is in deducting R_f from the market risk premium.

$r = E(R_i) = R_f + \beta[E(R_m) - R_f] = 0.012 + 1.4(0.075 - 0.012) = 0.1002$

$V_0 = FCFE_0(1+g)/(r-g) = 1.38 \times 1.08/(0.1002 - 0.08) = 73.78$

5.   Solution: C.

C is correct. When the low/high measure of each variable is tested singly for sensitivity in predicting a range of intrinsic value while holding the other variables at the base case, the equity risk premium variable produces the largest stock price range, as shown in the following table.

Variable	Valuation with Low Estimate	Valuation with High Estimate	Valuation Range
Equity risk premium	$93.15	$25.70	$67.45
FCFE growth rate	$25.67	$89.29	$63.63
Beta	$70.14	$28.25	$41.88

Note: The risk-free rate is 1.2% in all cases.

A is incorrect per the calculations shown above.

B is incorrect per the calculations shown above.

6. Solution: B.

B is correct. A sum-of-the-parts valuation sums the estimated values of each of the company's businesses as if each business were an independent going concern. Baker's statement describes such a valuation approach. Baker noticed that a division is unrelated and mentions the value that might be unlocked via a spin-off. Covey suggests an absolute valuation approach by comparing intrinsic and market values. Paschel suggests two methods: comparables and justified price multiples.

A is incorrect. Paschel has used comparables and justified price multiple methods.

C is incorrect. Covey has used an absolute value approach by comparing intrinsic and market values.

7. Fixed income

Case 1: Natalia Berg（考点 : Yield curve analysis, embedded options）

1. Solution: A.

Each of the portfolios has an effective duration of five, so a parallel shift in the yield curve will have the same effect on each portfolio, and each will experience the same price performance.

2. Solution: B.

The exposure of each portfolio to changes in the 5- and 10-year rates are equal to the sum of the 5- and 10-year key rate durations:

Portfolio 1 exposure = 0.20 + 0.15 = 0.35

Portfolio 2 exposure = 0.40 + 4.00 = 4.40

Portfolio 2 has the largest exposure, and portfolio 1 has the smallest exposure. If the 5- and 10-year key rates increase, portfolio 1 will fall by the smallest amount and will experience the best price performance (i.e., the smallest decrease in value).

You can confirm this by doing the calculations for a 20 basis point increase:

% change in portfolio 1 = (-0.20 x 0.002 x 100) + (-0.15 x 0.002 x 100) = (-0.35 x 0.002 x 100) = -0.07%

% change in portfolio 2 = (-0.40 x 0.002 x 100) + (-4.00 x 0.002 x 100) = (-4.40 x 0.002 x 100) = -0.88%

3. Solution: A.

Statement 1 is correct. Swap markets tend to have more maturities with which to construct a yield curve as compared to government bond markets. Statement 2 is correct. Retail banks tend to have little exposure to swaps and hence are more likely to use the government spot curve as their benchmark.

4. Solution: C.

The value of a 3-year bond extendible by one year is equal to an otherwise identical 4-year bond that is puttable in three years. Accordingly, the value of bonds B and C should be the same.

5. Solution: C.

The steps in the process of calculating the effective duration of a callable bond using a binomial tree are as follows:

Step 1: Given assumptions about benchmark interest rates, interest rate volatility, and the call and/or put rule, calculate the OAS for the issue using the binomial model.

Step 2: Impose a small parallel shift in the on-the-run yield curve by an amount equal to +Δy.

Step 3: Build a new binomial interest rate tree using the new yield curve.

Step 4: Add the OAS to each of the 1 -year forward rates in the interest rate tree to get a "modified" tree. (We assume that the OAS does not change when interest rates change.)

Step 5: Compute $BV_{+\Delta y}$ using this modified interest rate tree.

Step 6: Repeat steps 2 through 5 using a parallel rate shift of -Δy to estimate a value of $BV_{\Delta y}$.

There is no restriction on the relationship between the assumed change in the yield (Δy) and the OAS.

6. Solution: B.

An upward sloping yield curve predicts an increase in short-term rates according to the pure expectations theory but not necessarily the liquidity premium theory.

The liquidity theory says that forward rates are a biased estimate of the market's expectation of future rates because they include a liquidity premium. Therefore, a positive sloping yield curve may indicate either (1) that the market expects future interest rates to rise or (2) that rates are expected to remain constant (or even fall), but the addition of the liquidity premium results in a positive slope.

Case 2: William Rogers (考点：Valuation of embedded option)

1. Solution: C.

Statement 1 is correct. If the volatility of interest rates decreases, the call option is less valuable, which increases the value of the callable bond. Recall that $V_{callable} = V_{noncallable} - V_{call}$. Statement 3 is also correct. The value of the noncallable bond increases by more than the callable bond because as yield falls, the value of the call goes up. As the call value increases, the callable value (noncall value - call option value) goes up by less than the noncall value.

2. Solution: B.

Statement 2 is incorrect because the noncallable bond value will be affected by a change in the level of interest rates.

Statement 4 is correct because higher interest rate volatility will increase the value of the embedded put option and increase the value of the puttable bond.

3. Solution: A.

The answer is 1.56 and is found by taking the difference between the value of the *callable and the noncallable bonds: Call option value = 99.77 - 98.21 = 1.56.*

4. Solution: B.

In this case, the bond is callable and puttable at the same price (100). Because Walters states that the embedded options (the issuer's call option and the holder's put option) will be exercised if the option has value (i.e., is in-the-money), the value of the bond must be 100 (plus the interest) at all times. Why? If rates fall and the computed value goes above 100, the company will call the issue at 100. Conversely, if rates increase and the computed value goes below 100, the bondholder will "put" the bond back to the issuer for 100.

The OAS is a constant spread added to every interest rate in the tree so that the model price of the bond is equal to the market price of the bond. In this case, using the interest rate lattice, the model price of the callable bond is greater than the market price. Hence, a positive spread must be added to every interest rate in the lattice. When a constant spread is added to all the rates such that the model price is equal to the market price, you have found the OAS. The OAS will be positive for the callable bond.

5. Solution: B.

The answer is 93.26. This value of the non-callable bond at node A is computed as follows:

$$value = \frac{[0.5 \times (V_{up} + \frac{coupon}{2})] + [V_{down} \times (100 + \frac{coupon}{2})]}{(1 + \frac{int\,erest\ rate}{2})}$$

$$= \frac{[0.5 \times (91.73 + \frac{6}{2})] + [0.5 \times (96.17 + \frac{6}{2})]}{(1 + \frac{0.0791}{2})} = 93.26$$

6. Solution: A.

The correct value is 100.00. The computed value of the callable bond at node A is obtained as follows:

$$value = \frac{[0.5 \times (100 + \frac{6}{2})] + [0.5 \times (100 + \frac{6}{2})]}{(1 + \frac{0.0315}{2})}$$

However, when working with a callable bond, you have to remember that the value of the bond at any node is the lesser of (1) the bonds computed value or (2) the call price. So, we have:

$$value = Min[100, \frac{[0.5 \times (100 + \frac{6}{2})] + [0.5 \times (100 + \frac{6}{2})]}{(1 + \frac{0.0315}{2})}] = 100$$

In this case, since the computed value (101.4) is greater than the call price (100), the nodal value is $100.

Case 3: Susan Evermore Case Scenario（考点：**Valuation of embedded option**）

1. Solution: C.

The value of a putable bond is equal to the value of an otherwise equivalent option-free bond plus the value of the embedded put option. The value of the embedded put option will decrease if yield volatility decreases. The value of the option-free bond will not be affected by changes in yield volatility, so the value of the putable bond will also decrease. Evermore is incorrect in her analysis of both effects.
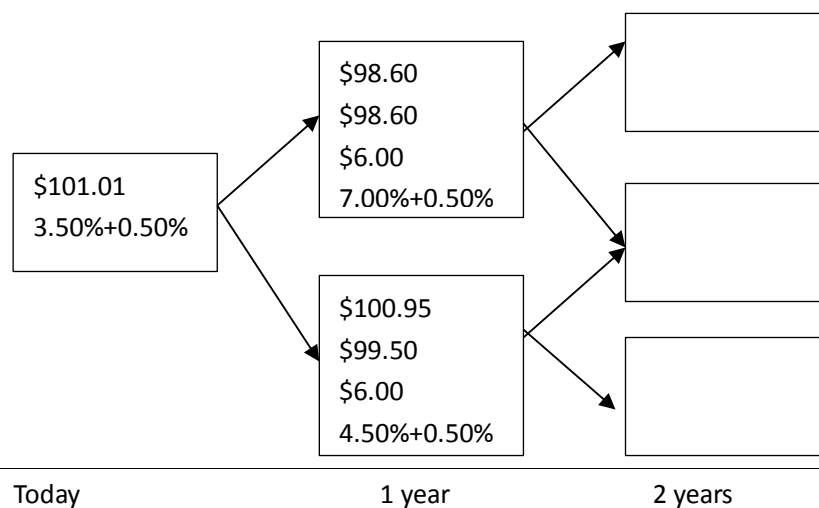
2. Solution: A.

The computed value of a putable bond decreases with a decrease in the assumed level of volatility and therefore the OAS needed to force the model price to be equal to market price will be lower.

3. Solution: B.

The bond will be called in the lower node if the interest rate (including OAS) is 5.0% because the present value of the remaining cash flows ($100.95) is greater than the call price ($99.50). The bond will not be called if rates increase to 7.5% in the upper node because the value of the bond ($98.60) is less than the call price ($99.50). The value of the callable bond according to the model is 101.01:

$$v_0 = \frac{1}{2}\left[\frac{98.60+6.00}{1.04} + \frac{99.50+6.00}{1.04}\right] = 101.01$$

| Today | 1 year | 2 years |

4. Solution: C.

The benchmark securities used to create the tree are Treasury securities, so the OAS for each callable corporate bond reflects additional credit risk and liquidity risk relative to the benchmark.

The bonds are overvalued if their OAS are smaller than the required OAS and undervalued if their OAS are larger than the required OAS. The required OAS for both bonds is the Z-spread over Treasuries on comparably rated securities with no embedded options. That required spread is not provided in the vignette. The BB-rated issue is overvalued because its OAS is less than zero, which means it must be less than the required OAS. Therefore, Evermore is correct in her analysis of the BB-rated issue.

The AA-rated issue has a positive OAS relative to the Treasury benchmark, but we don't know the required OAS on similar bonds, so we can't determine whether or not the AA-rated issue is over or undervalued based on the information given. Therefore, Evermore is incorrect to conclude that the issue is undervalued.

5. Solution: A.

Davenport has correctly outlined the appropriate methodology for using a binomial model to estimate effective duration and effective convexity. Evermore fails to adjust for the OAS and, instead, simply adds 100 basis points to every rate on the tree rather than shifting the yield curve upward and then recreating the entire tree using the same rate volatility assumption from the first step. Even if both use the same rate volatility assumption and the OAS is equal to zero, the two methodologies will generate significantly different duration and convexity estimates.

6. Solution: C.

The value of a callable convertible bond is equal to the value of an option-free bond plus the value of the conversion option on the stock minus the value of the call option on the bond.

A decrease in the volatility of High four's common stock returns will decrease the value of the conversion option on the stock. Consequently the value of the convertible bond will also decrease. Evermore was correct in her analysis, and Davenport was incorrect to disagree with her.

A decrease in the yield volatility will decrease the value of the embedded call option. The issuer has written the call option, so a decrease in the value of the call option will increase the value of the convertible bond. Evermore is incorrect in her analysis, and Davenport was correct to disagree with her.

Case 4: Michael Thomas, CFA (考点：Credit analysis models, Yield curve analysis)

1. Solution: C.

The present value of expected loss measure in credit analysis uses risk-neutral probabilities in calculating expected value of loss. The adjustment to probabilities to account for the risk of the cash flows is the risk premium.

2. Solution: B.

Under the structural model's debt option analogy, owning a company's debt is economically equivalent to owning a riskless bond that pays K dollars at time T, plus simultaneously selling a European put option on the assets of the company with maturity T and strike price K.

3. Solution: A.

Time to Cash Flow	Cash Flow	Risk-Free Spot Rate	Credit Spread (%)	Total Yield (%)	PV (risk-free rate)	PV (total yield)
0.5	20	1.50%	0.20%	1.70%	19.85	19.83
1	20	1.75%	0.25%	2.00%	19.65	19.60
1.5	20	2.00%	0.30%	2.30%	19.41	19.32
2	1020	2.25%	0.35%	2.60%	975.12	968.32
				Total	$1,034.03	$1,027.07

Present value of expected loss = PV(risk-free rate) - PV (total yield) = 1,034.03 - 1,027.07 = $6.96

4. Solution: C

The relevant assumption is that the value of the assets (at maturity) has a lognormal distribution.

5. Solution: C

Evaluating credit risk for an ABS should include the probability of loss because the probability of default does not apply. When there are defaults within the collateral pool of an ABS, the losses are absorbed according to the waterfall provisions in the ABS structure. The probability of default applies to sovereign debt.

6. Solution: A.

Market participants typically prefer to use the swap-rate curve as a benchmark (rather than a government bond yield curve) for the following reasons:

•   The availability of swaps and the equilibrium pricing are driven only by the interaction of supply and demand. It is not affected by technical market factors that can affect government bond yields.

- The swap market is not regulated by any government, which makes swap rates across different countries more comparable.

- Swap curves across countries are also more comparable than sovereign bond yield curves because swap curves reflect similar levels of credit risk, while sovereign bond yield curves also reflect credit risk unique to each country's government bonds.

- The swap curve typically has yield quotes at 11 maturities between 2 and 30 years. The U.S. government bond yield curve typically only has on-the-run issues trading at four maturities between 2 and 30 years.

Case 5: Jon Stevenson, CFA（考点：credit analysis models）

1. Solution: A.

Structural models require that the company's assets trade in a frictionless arbitrage free market.

2. Solution: C.

Reduced form models assume that given the macroeconomic state variables, a company's default represents idiosyncratic risk. Structural models assume a constant (non-stochastic) risk-free rate and that the time T value of the assets is characterized by a lognormal distribution.

3. Solution: B.

Ratings tend to be stable over time, which reduces their correlation to default probabilities; hence, Point 1 is incorrect.

4. Solution: C.

The maximum amount an investor would to pay to remove the credit risk is the present value of the expected loss.

5. Solution: B.

The time value of money discount will always reduce the present value of expected loss. Because the present value of expected loss in this case is higher than the expected loss, the risk premium for risk of credit loss must be larger than the time value of money discount.

6. Solution: B.

Under the option analogy of the structural model, risky debt can be viewed as a portfolio comprising a long position in risk-free debt and a short put option on the company's asset with a strike price equal to the face value of the risky debt. When the asset volatility increases, the value of the put option increases and the value of the portfolio with short exposure to the put option will decrease. Hence the computed value of risky debt will be lower.

Case 6 : GD Barton, Inc.（考点：**CDS**）

1.   Solution: B.

POPRT is part of the index CDS. GD sold protection of $350 million over the 125 equally weighted entities, meaning that it has effective exposure of $350 million / 125 = $2.8 million

On the single-name POPRT CDS, GD purchased protection of $2.5 million, leaving a net notional exposure of 2.8 - 2.5 = $0.3 million.

2.   Solution: B.

As the credit spread for TRTRS has widened and GD has purchased protection, GD will gain by selling protection at a higher premium.

3.   Solution: C.

Typically, an LBO will result in an increase in the probability of default due to the large increase in debt levels. An investor would, therefore, seek to buy protection, as the premium would rise along with the probability of default. Due to the takeover premium that would result from the LBO, Eagen would also benefit by going long TRTRS stock.

Case 7: Wingaersheek Arbitrage Opportunities（考点：The arbitrafe-free valuation framework）

1. Solution: A.

The value of the bond's cash flows using spot rates is $103.4816 and is determined as follows:

$103.4816 = 3.2/1.011 + 3.2/(1.01504)^2 + 103.2/(1.02013)^3$

So, strips could be purchased for $103.4816 and reconstituted into the bond, which could be sold for $103.50, representing an arbitrage opportunity.

B is incorrect because reconstituting the bond requires valuing all the strips and comparing to the market price of the bond. There are no market prices for strips provided to make a comparison between the arbitrage-free value of each individual strip.

C is incorrect because incorrectly using the par rates instead of the spot rates, the bond's cash flows have a value of $103.519, producing an arbitrage opportunity to buy the bond, strip the cash flows, and sell them at a profit.

2. Solution: C.

Annisquam is incorrect in Comment 1. The interest rate tree performs two functions in the valuation process: (1) generating the cash flows that are interest rate dependent and (2) supplying the interest rates used to determine the present value of the cash flows.

A is incorrect because Comment 3 is correct.

B is incorrect because Comment 2 is correct.

3. Solution: C.

Find prices one period from the end. Value at Year 2:

$0.5 \times [(104/1.0450) + (104/1.0450)] + 4 = 103.522$

$0.5 \times [(104/1.0325) + (104/1.0325)] + 4 = 104.726$

$0.5 \times [(104/1.0235) + (104/1.0235)] + 4 = 105.612$

Find prices two periods from the end. Time 1 values are the average of Time 2 discounted plus the coupon payment.

$0.5 \times [(103.522/1.0360) + (104.726/1.0360)] + 4 = 104.506$

$0.5 \times [(104.726/1.0260) + (105.612/1.0260)] + 4 = 106.504$

Find prices at Time 0. There is no coupon paid in this node. $0.5 \times [(104.506/1.029) + (106.504/1.029)] = 102.532$

A is incorrect because the discount rate used is an average across time.

B is incorrect because the calculation omits the 4 coupon in the last period.

4. Solution: B.

Annisquam is correct with regards to his comments on calibrating a binomial interest rate tree.

A is incorrect because his comments are correct. C is incorrect because his comments are correct.

5. Solution: B.

The binomial tree is based on the spot rate curve and a no arbitrage condition, therefore any option-free bond should have the same value whether using the spot rate curve or the binomial tree.

A is incorrect because the use of a benchmark bond would not impact the valuation.

C is incorrect because the shape of the curve would not impact valuations under the two methodologies.

6. Solution: C.

Using a Monte Carlo simulation, the model will produce benchmark bond values equal to the market prices only by chance. A constant is added to all interest rates on all paths such that the average present value for each benchmark bond equals its market value.

A is incorrect because adjusting the volatility assumption will generate another random value not equal to the benchmark bond value. The benchmark bond is option-free, so its value should not be affected by interest rate volatility.

B is incorrect because increasing the model beyond 2000 paths will not lead to a different average value for the benchmark bond.

Case 8: Daniela Ibarra（考点：**Credit analysis models**）

1. Solution: B.

The following table shows that the credit valuation adjustment (CVA) for the bond is €36.49, the sum of the present values of expected loss. The steps taken to complete the table are as follows.

Step 1: Exposure at Date T is €1,000/ $(1+r)^{4-T}$, where r is 3%. That is, exposure is computed by discounting the face value of the bond using the risk-free rate and the number of years until maturity.

Step 2: Recovery = Exposure × Recovery rate

Step 3: Loss given default (LGD) = Exposure – Recovery

Step 4: Probability of default (POD) on Date 1 is 1.50%, the assumed hazard rate. The probability of survival (POS) on Date 1 is 98.50%.

For subsequent dates, POD is calculated as the hazard rate multiplied by the previous date's POS. For example, to determine the Date 2 POD (1.4775%), the hazard rate of (1.50%) is multiplied by the Date 1 POS (98.50%).

Step 5: POS in Dates 2–4 = POS in the previous year – POD

(That is, POS in Year T = POS in year [T – 1] – POD in Year T.)

POS can also be determined by subtracting the hazard rate from 100% and raising it to the power of the number of years:

$(100\% - 1.5000\%)^1 = 98.5000\%$

$(100\% - 1.5000\%)^2 = 97.0225\%$

$(100\% - 1.5000\%)^3 = 95.5672\%$

$(100\% - 1.5000\%)^4 = 94.1337\%$

Step 6: Expected loss = LGD × POD

Step 7: Discount factor (DF) for Date T is $1/(1+r)^T$, where r is 3%.

Step 8: PV of expected loss = Expected loss × DF

Date	Exposure	Recovery	LGD	POD	POS	Expected Loss	DF	PV of Expected Loss
0								
1	915.14	274.54	640.60	1.5000%	98.5000%	9.61	0.970874	9.33
2	942.60	282.78	659.82	1.4775%	97.0225%	9.75	0.942596	9.19
3	970.87	291.26	679.61	1.45	95.5672%	9.89	0.9151	9.05

4	1,000.00	300.00	700.00	53% 1.4335%	94.1337%	42 10.03	0.888487	8.92
						CVA =	€36.49	

Value of the bond if the bond were default free would be 1,000 × DF for Date 4 = €888.49.

Fair value of the bond considering CVA = €888.49 − CVA = €888.49 − €36.49 = €852.00.

Because the market price of the bond (€875) is greater than the fair value of €852, B is correct.

A is incorrect because the market price of the bond differs from its fair value. C is incorrect because although the bond's value if the bond were default free is greater than the market price, the bond has a risk of default, and CVA lowers its fair value to below the market price.

2. Solution: B.

The recovery rate to be used now in the computation of fair value is 30% × 1.25 = 37.5%, whereas the hazard rate to be used is 1.50% × 1.25 = 1.875%.

Using the steps outlined in the solution to Question 1, the following table is prepared, which shows that the bond's CVA increases to 40.49. Thus, Koning concludes that a change in the probability of default has a greater effect on fair value than a similar change in the recovery rate. The steps taken to complete the table are the same as those in the previous problem. There are no changes in exposures and discount factors in this table.

Date	Exposure	Recovery	LGD	POD	POS	Expected Loss	DF	PV of Expected Loss
0								
1	915.14	343.18	571.96	1.8750%	98.1250%	10.72	0.970874	10.41
2	942.60	353.47	589.12	1.8398%	96.2852%	10.84	0.942596	10.22
3	970.87	364.08	606.80	1.8053%	94.4798%	10.95	0.915142	10.03
4	1,000.00	375.00	625.00	1.7715%	92.7083%	11.07	0.888487	9.84
							CVA =	40.49

Changes in the hazard and recovery rates do not affect the value of the default-free bond. So, it is the same as in the previous question: €888.49.

Fair value of the bond considering CVA = €888.49 − CVA = €888.49 − €40.49 = €848.00

3. Solution: C.

Structural models require information best known to the managers of the company. Reduced-form models only require information generally available in financial markets

A is literally true but when when models were developed is immaterial. Structural models are currently used in practice by commercial banks and credit rating agencies.

B is incorrect because computer technology facilities valuation using option pricing models as well as regression analysis.

4. Solution: A.

The changing probability of default will not affect the binomial tree prepared in the solution to Question 11. The Date 1 value remains €1,154.27, which is also the VND. The expected exposures, loss given default, and discount factors are also unaffected by the changing probability of default. The following is the completed credit valuation adjustment table.

Date	Exposure	LGD	POD	POS	Expected Loss	DF	PV of Expected Loss
0							
1	1,151.38	805.97	1.5000%	98.5000%	12.09	1.002506	€ 12.12
2	1,133.58	793.51	0.4925%	98.0075%	3.91	0.985093	€ 3.85
3	1,108.90	776.23	0.4900%	97.5175%	3.80	0.955848	€ 3.64
4	1,087.07	760.95	0.4876%	97.0299%	3.71	0.913225	€ 3.39
						CVA =	€ 22.99

Thus, CVA decreases to €22.99.

5. Solution: C.

The credit rating agencies typically make incremental changes as seen in a transition matrix provided in Exhibit 7 of the reading. Ibarra believes the bond to be undervalued, in that her assessment of the probability of default and the recovery rate is more optimistic than that of the agencies. Therefore, she most likely expects the credit rating agencies to put the issuer on a positive watch.

A is incorrect because the bond is perceived to be undervalued, not overvalued. Ibarra is not expecting a credit downgrade.

B is incorrect because it is not the most likely expectation. The rating agencies rarely jump an issuer all the way from BBB to AAA. In Exhibit 7, the probability of a BBB rated issuer going from BBB to AAA is 0.02%, whereas it is 4.80% to go from BBB to A.

6. Solution: A.

B is incorrect because, although generally true for investment-grade bonds, the statement neglects the fact that high-yield issuers sometimes face a downward-sloping credit term structure. Credit term structures are not always upward sloping.

C is incorrect because there is a consistent pattern to the term structure of credit spreads—typically it is upwardly sloped because greater time to maturity is associated with higher projected probabilities of default and lower recovery rates.

8. Derivatives

Case 1: Ryan Parisi Case Scenario（考点：**Pricing & valuation of forward**）

1. Solution: A.

At inception the value of a forward contract is set to zero. That is:

$$V_0(0,T) = S_0 - \frac{F(0,T)}{(1+r)} = 0$$

2. Solution: A.

$$V_{30}(0,60) = (1450.82e^{-0.025(30/360)}) - (1403.22e^{-0.0392(30/360)}) = \$1,447.80 - \$1,398.64 = \$49.16$$

3. Solution: B.

PV of coupons $= 25/(1.04)^{90/360} + 25/(1.04)^{270/360} = 24.7561 + 24.2753 = \$49.03$

$$F(0,360) = (1071.33 - 49.03)(1.04)^{360/360} = \$1,063.19$$

4. Solution: C

Parisi is incorrect. Kwon has entered into a short forward contract. Between marked to market dates, if the price of the contract rises above the price of the contract at inception, it is Kwon's counterparty that is exposed to credit risk, not Kwon. Kwon is exposed to credit risk if the price of the contract falls below the price of the contract at inception.

5. Solution: C.

$$FRA(0,90,360) = \left[\frac{1+0.045(\frac{450}{360})}{1+0.032(\frac{90}{360})} - 1\right](\frac{360}{360}) = 0.0479$$

6. Solution: B.

$$F(0,T) = \left(\frac{1.3900}{(1.06)^{270/360}}\right)(1.04)^{270/360} = \$1.3703\,per\,€$$

Case 2: Meredith Whitney Case Scenario（考点：**Pricing & valuation of swap**）

1.   Solution: B.

The appropriate present value factors are provided below:

$B_0(90)$ 0.9965
$B_0(180)$ 0.9909
$B_0(270)$ 0.9843
$B_0(360)$ 0.9669

For example, $B_0(90)$ is calculated as:

$$\frac{1}{1+0.0142\times\left(\dfrac{90}{360}\right)}=0.9965$$

Other present value factors are calculated in a similar manner.

The fixed rate is calculated as follows:

$$\frac{1.0-B_0\left(h_n\right)}{\displaystyle\sum_{j=1}^{n}B_0\left(h_j\right)}$$

$$\frac{1.0-0.9669}{0.9964+0.9909+0.9843+0.9669}=0.0084$$

The annualized rate = 0.0084 × 4 = 0.0336

2.   Solution: B

Per $1 of notional principal the present value of the fixed payments= (0.0084) × (0.9972 + 0.9903 + 0.9772 + 0.9587) + (1 × 0.9587) = 0.9917

Per $1 the present value of the floating payments = present value of first floating payment + the present value of future floating payments= ((0.0142 × 90 / 360) + 1) × (0.9972) = 1.0007

The market value of the pay floating receive fixed rate swap = $250,000,000 × (0.9917 − 1.0007)= −$2,250,000

3.   Solution: B.

Initially Grand receives €25,000,000 and pays HK$285,500,000 based on the current exchange rate of HK$11.42 per euro. We are told that Grand will pay an interest rate of 2.32% on the euro

and receive 1.84% on the Hong Kong dollar.

Forty-five days into the swap:

Per HK$1 of notional principal the present value of the fixed payments received on the Hong dollar = (0.0046) × (0.9976 + 0.9909 + 0.9834 + 0.9674) + (1 × 0.9674) = 0.9855

Per €1 of notional principal the present value of the fixed payments paid on the euro= (0.0058) × (0.9963 + 0.9888 + 0.9811 + 0.9650) + (1 × 0.9650) = 0.9878

Note that based on the exchange rate of HK$11.42, the actual notional principal = 1 / 11.42 = €0.08757

The present value of euro fixed payments = 0.9878 × 0.08757 = 0.08649

The present value of euro fixed payments in HK$ = 0.08649 × 9.96 = 0.8615

The market of the swap = 285,500,000 × (0.9855 − 0.8615) = HK$35,402,000

4. Solution: B.

The market value of the swap per $ notional principal = value of $1 investment in equity − present value of floating payment.

Value of $1 investment in equity = 905 / 925 = 0.97838

Per $1 the present value of the floating payments = present value of first floating payment + the present value of future floating payments= ((0.0142 × 90 / 360) + 1) × (0.9972) = 1.0007

Market value of swap = (0.97838 − 1.0007) × $100,000,000 = −$2,232,000

5. Solution: A.

At this point, 45 days into the swap, the swap can be settled with a cash payment to the counterparty if the market value is negative. Alternatively, if the market value is positive, then Novatel would receive a cash payment from the counterparty.

6. Solution: C.

Interest rate and equity swaps do not involve an exchange of principal. Therefore, credit risk is greater during the middle of the life of these swaps. KPS Financial has entered into an equity swap, so the credit risk is higher during the middle of its life.

Case 3: Huang（考点：Pricing & valuation of forward and futures）

1.   Solution: C.

The value of a long position in a forward contract at any time is

$V_t = S_t - F_{(0,T)}/(1 + r)^{(T - t)}$

where

S = the underlying price

F = the forward price

r = the risk-free rate

T = the time to expiration at contract initiation

t = the time elapsed since initiation

Then, $V_t = 75 - 80/(1.06)^{0.25} = -\$3.84$, but this is the value of the long position. The value of the short position has the opposite sign and is $3.84.

2.   Solution: B.

The formula for the price of a forward contract on an equity index is:

$F(0, T) = S_0 e^{-(\delta c)T} e^{(rc)T}$

where

F(0,T) = the price of a forward contract initiated at time 0 and expiring at time T

S_0 = the spot price of the underlying

δ_c = the continuously compounded dividend yield

r_c = the continuously compounded interest rate

T = 180/365 = 0.4932, which is the time to expiration of the contract in years.

Then,

$$F = 1250\left[e^{-0.03(0.4932)} \right]\left[e^{0.0583(0.4932)} \right] = \$1,267.57$$

3.   Solution: A.

The formula for the forward exchange rate is:

$F(0,T) = S_0[(1 + r)^T/(1 + r^f)^T]$

where

F(0,T) = the forward exchange rate of a forward contract initiated at time 0 and expiring at time T

S_0 = the spot price

r = the domestic risk-free rate

r^f = the foreign risk-free rate

The formula assumes the currency quote is dollars per yen. If the quote is yen per dollar (as is the case here), then the forward price is $S_0[(1 + r^f)^T/(1 + r)^T]$, so

$F = 112(1.01/1.06)^{90/365} = JPY110.67/USD$.

Note that the continuous formula, $F = S_0e^{r^fT}e^{-rT}$, can be used. Converting the given rates to continuous rates gives $r^f = \ln(1.01) = 0.00995$ and $r = \ln(1.06) = 0.05827$.

$F = 112e^{(90/365)(0.00995-0.05827)} = JPY\ 110.67/USD$.

4. Solution: A.

At expiration, if the market value of the contract is positive (Manager B sold the yen at a higher price than she could sell it at expiration), Manager B will only receive the agreed-on price if the other party does not default.

5. Solution: B.

The value of a futures contract before it has been marked to market can be greater than or less than zero. The value is the gain or loss accumulated since the last mark-to-market adjustment.

6. Solution: B.

The futures price formula is $f_0(T) = S_0 (1+r)^T + FV(CB,0,T)$, where $FV(CB,0,T)$ represents the future value (FV) of the costs of storage minus the convenience yield. Thus the convenience yield decreases the futures price.

Case 4: Bridget Moyle（考点：**Pricing & valuation of futures, swap and option**）

1. Solution: A.

Petsas' response to Moyle is correct. Futures and spot prices must converge at expiration. If they do not, then it is possible to earn an arbitrage profit. If the spot price is greater than the futures price, then one could earn an arbitrage profit by buying the futures contract and executing the contract to purchase the underlying at the lower futures price and to sell it at the higher spot price. If the futures price exceeds the spot price at expiration, then an investor could purchase the asset at the spot price and enter into a short futures contract to sell it at the higher price, thus locking in a profit.

2. Solution: B.

The futures price is calculated as follows:

$$f_0(T) = \frac{B_0^C(T+Y)[1+r_0(T)]^T - FV(CI,0,T)}{CF(T)}$$

$$f_0(T) = \frac{\$156,000[1.015]^{\frac{8}{12}} - \$3,508.6958}{1.098} = \$140,298.21$$

$\$3,508.6958 = 3,500(1.015)^{(2/12)}$.

3. Solution: A.

$$\pi = \frac{1+r-d}{u-d} = \frac{1+0.0025-0.96}{1.12-0.96} = 0.2656$$

$$1-\pi = 0.7344$$

p $^{++}$ = Max[0, X − S^{++}] = Max[0, 590 − 765.06] = 0

p $^{+-}$ = Max[0, X − S^{+-}] = Max[0, 590 − 655.76] = 0

p $^{--}$ = Max[0, X − S^{--}] = Max[0, 590 − 562.08] = 27.92

S $^{++}$ = 609.90 × 1.12 × 1.12 = 765.06

S $^{+-}$ = 609.90 × 1.12 × 0.96 = 655.76

S $^{--}$ = 609.90 × 0.96 × 0.96 = 562.08

$$p = \frac{\pi p^+ + (1-\pi)p^-}{(1+r)} = \frac{0.2656 \times 0 + 0.7344 \times 20.45}{1.0025} = \$14.98$$

$$p^- = \frac{\pi p^{-+} + (1-\pi)p^{--}}{(1+r)} = \frac{0.2656 \times 0 + 0.7344 \times 27.92}{1.0025} = \$20.45$$

$$p^+ = \frac{\pi p^{++} + (1-\pi)p^{+-}}{(1+r)} = \frac{0.2656 \times 0 + 0.7344 \times 0}{1.0025} = \$0$$

4. Solution: C.

Iacocca is incorrect about the risk-free rate. Higher risk-free rates result in higher call option prices and lower put option prices. She is correct about the impact of time to expiration and volatility on put and call option prices.

5. Solution: A.

Petsas is incorrect in stating that an interest rate swap is a combination of a long interest rate call option and a long interest rate put option. A combination of the purchase of an interest rate call option and the sale of an interest rate put option is equivalent to a plain vanilla interest rate swap payment. Thus, if the underlying variable rate is below the exercise rate, the call is worthless and the short put will require a net payment to the holder of the put. This scenario replicates the situation in an interest rate swap in which the fixed payment (exercise rate) exceeds the variable rate resulting in a net payment by the buyer of the swap.

6. Solution: C.

The appropriate present value factors are provided in the following table:

$B_0(90)$	0.9922
$B_0(180)$	0.9832
$B_0(270)$	0.9728
$B_0(360)$	0.9604

$$B_0(90) = \frac{1}{1 + 0.0313 \times (\frac{90}{360})} = 0.9922$$

$$B_0(180) = \frac{1}{1 + 0.0341 \times (\frac{180}{360})} = 0.9832$$

$$B_0(270) = \frac{1}{1 + 0.0373 \times (\frac{270}{360})} = 0.9728$$

$$B_0(360) = \frac{1}{1 + 0.0412 \times (\frac{360}{360})} = 0.9604$$

The fixed rate is calculated as follows:

$$\frac{1.0 - B_0(h_n)}{\sum_{j=1}^{n} B_0(h_j)},$$

$$\frac{1.0 - 0.9604}{0.9922 + 0.9832 + 0.9728 + 0.9604} = 0.0101$$

The annualized rate = 0.0101 × 4 = 0.0404.

Case 5: Shirley Nolte（考点：BSM model）

1.　Solution: A.

Nolte is long in the underlying stock, so she should short call options, and she can use any of the options to delta hedge. The hedge ratio (the number of calls per share) is (1 / delta), so any of these four short call positions will hedge her long position in the stock:

(1/0.54) x 5000=9259　1-month call options

(1/0.58) x 5000=8621　3-month call options

(1/0.61) x 5000=8197　6-month call options

(1/0.63) x 5000=7937　9-month call options

2.　Solution: A.

The hedge must be continually rebalanced, even in the unlikely event that the stock price doesn't change, because the option's delta changes as time passes and the option approaches maturity. If she simultaneously buys an equivalent amount of put options, the overall position (including the calls, the puts, and 5,000 shares of Pioneer) will no longer be delta hedged.

3.　Solution: C.

Gamma risk arises when the price of the underlying jumps abruptly (as opposed to smoothly).

3.　Solution: B.

Delta hedged portfolio consists of long position in stocks and short position in call options. Because the gamma of long stock position is zero and the gamma of short call is negative, the net gamma of a delta hedged portfolio is negative.

As the stock price increases, call delta increases and we need fewer calls. As we reduce the number of short calls, the net gamma increases (becomes less negative).

4.　**Solution: B.**

Both the 3-month and the 9-month put options are correctly priced according to put- call parity. Note that you are given the continuously compounded risk-free rate, so you have to use the continuous version of put-call parity.

$$P_0 = C_0 - S_0 + \frac{X}{e^{R_f^c \times T}}$$

$$P(3-month) = \$5 + \frac{\$40}{e^{0.05 \times 0.25}} - \$40 = \$4.50$$

$$P(9-month) = \$8.81 + \frac{\$40}{e^{0.05 \times 0.75}} - \$40 = \$7.34$$

Therefore, she's correct that the 3-month put is not mispriced, but incorrect in her conclusion that the 9-month put is mispriced.

5. Solution: B.

Both the 3-month and the 9-month put options are correctly priced according to put- call parity. Note that you are given the continuously compounded risk-free rate, so you have to use the continuous version of put-call parity.

$$P_0 = C_0 - S_0 + \frac{X}{e^{R_f^c \times T}}$$

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$$P(9-month) = \$8.81 + \frac{\$40}{e^{0.05 \times 0.75}} - \$40 = \$7.34$$

Therefore, she's correct that the 3-month put is not mispriced, but incorrect in her conclusion that the 9-month put is mispriced.

6. Solution: C.

$S_0 = \$60$, $S^+ = 60(1.15) = \$69$, $S^- = 60(0.85) = \$51$, $X = \$60$.

$C^+ = 69 - 60 = \$9$, $C^- = 0$.

$$h = \frac{C^+ - C^-}{S^+ - S^-} = \frac{9 - 0}{69 - 51} = 0.5$$

$$C_0 = hS_0 + \frac{-hS^+ + C^+}{1 + R_f} = 0.5(60) + \frac{(-0.5)(69) + 9}{(1.05)} = \$5.71$$

Because the current call price of $6.90 is higher than the no-arbitrage price, an arbitrage profit can be earned by writing calls and buying 0.5 shares per call written.

Case 6: Pablo Ramiro（考点：Option strategy）

1.   **Solution: A.**

Expected stock price: (0.2 x 42) + (0.2 x 44) + (0.6 x 36) = $38.80

Expected loss using Dec 39: [(41.28 — 39) + 4.20] x 140,000 = $907,200

Expected loss using Dec 38: [(41.28 — 38.8) + 3.62] x 140,000 = $854,000

Dec 38 loss smaller by: 907,200 - 864,000 = $53,200

2.   **Solution: C.**

To hedge the return on an equity portfolio, AHI would pay equity and receive the floating rate (LIBOR). However, if the return on the equity portfolio was negative, it would receive this return (i.e., "pay" a negative return) and also receive 90-day LIBOR.

3.   **Solution: C.**

The number of contracts required is based on the multiplier and the current price of the index. Given the index level is 2,250, the number of contracts required is:

$10,000,000/($250 x 2250) = 17.77.

4.   **Solution: A.**

Current stock price = $79

Price after a 10% decrease = 79 x 0.9 = $71.10

Price after a 10% increase = 79 x 1.10 = $86.90

Call option with intrinsic value of $1:

Intrinsic value = stock price - exercise price

or $1.00 = 79 - exercise price Exercise price = $78.00

A long straddle involves buying a put and call at the same strike with the same expiry; hence, Ramiro will use Dec 78 calls and Dec 78 puts.

Total premium paid = 4.60 + 3.22 = 7.82

Breakeven prices: = 78 + 7.82 = 85.82

                              = 78-7.82 =70.18

For a 10% decrease in price to $71.10, the straddle would not breakeven (loss of $0.92).

For a 10% increase in price to $86.90, the straddle would show a profit (profit of $1.08).

5.   **Solution: B.**

A short calendar spread using calls involves buying (long) the short dated call option and selling

(short) the longer dated call option. This would result in an inflow of 3.62 - 2.85 = $0.77.

6. Solution: C.

The payoff on a synthetic call is replicated using a long position in the underlying stock plus a long position in corresponding put option.

Alternatively, if Ramiro's position moved by $4.20 as a result of a $10.00 movement in the underlying stock, his position must have a delta of $4.20 / $10.00 = 0.42.

This corresponds to a Dec 82 call option delta. The synthetic call is made up of the long underlying and long Dec 82 put. Note that the delta of this position is also 0.42 (the underlying has a delta of 1, the put delta is -0.58).

Case 7: Michelle Norris（考点：**Currency swap**）

1.   Solution: A.

The futures price can be calculated by growing the spot price at the difference between the continuously compounded risk-free rate and the dividend yield as a continuously compounded rate. The continuously compounded risk-free rate is ln(l.040811) = 4%, so the futures price for a 240-day future is:

FP = S0e(r-d)t = 1,050e(0.04-0.02)(240/365) = 1,064

2.   Solution: C.

The futures price for a given contract maturity must converge to the spot price as the contract moves toward expiration. Otherwise, arbitrage opportunities would exist.

3.   Solution: B.

First, calculate the continuously compounded risk-free rate as ln(l.040811) = 4% and

then calculate the theoretically correct futures price as follows:

FP = S0e(r-d)t = 1,015e(4.0%-2.0%)(180/365) = 1,025

Then, compare the theoretical price to the observed market price: 1,035 — 1,025 = 10. The futures contract is overpriced. To take advantage of the arbitrage opportunity, the investor should sell the (overpriced) futures contract and buy the underlying asset (the equity index) using borrowed funds. Norris has suggested the opposite.

4.   Solution: B.

An increase in the growth rate in dividends for stocks would increase the spot price of the equity index. As the spot price increases, the futures price for a given maturity also increases (holding interest rates constant). Higher dividends during the short period of time until maturity of the futures contract would have only a minimal negative impact on the futures price.

5.   Solution: A.

Given the decrease in the index level, the value of the short party's position in a forward contract should be positive. Because the futures contracts are marked to market, the value to the short (or long) party only reflects the change in futures price since the last mark to market. Hence, the value of the futures contract should be lower than the value of the forward contract.

6.   Solution: A.

Based on the exchange rate at initiation, the notional principals were €1,000,000 and SF

1,120,000. Sixty days after initiation, the remaining settlement days are 30,120,210, and 300 days into the future. The value of the Swiss franc position (per 1 SF notional) is calculated as: (0.0096 / 4) x (0.9996 + 0.9978 + 0.9961 + 0.9932) + 1 x 0.9932 = SF 1.0028. For the notional principal of SF 1,120,000, the value is SF 1,123,136. Based on the current exchange rate, this translates into (1,123,136 / 1.10) euros or €1,021,033.

The euro position value is given as €1.0014 per €1 notional. For €1 million notional, this translates into a value of €1,001,400. Because Witkowski's client paid the euro notional at initiation, they will receive the euros and have a value of €1,001,400 - €1,021,033 = - €19,633.

9. Alternative

Case 1 Karen Westin(考点：Publicly Traded Real Estate Securities)

1. Solution: A

For industrial properties, the most important factor affecting economic value is retail sales growth, which is expected to be low in West Lundia. The most important factor affecting economic value for apartment REITs are job creation and population growth, which are both expected to be high. For office properties, the most important factor is job creation, which is expected to be high.

2. Solution: C

There are two components to this valuation. The first component is the cash flows for the first seven years. The second component is the terminal value.

PV of CFs in years 1-7:

PMT = 7.0; I/Y = 10; N = 7. The PV = WL $34.08 million.

PV of terminal value:

An appropriate terminal cap rate can be calculated using the following equation:

cap rate = discount rate — growth rate = 10% - 3.25% = 6.75%.

The terminal value is calculated using the following inputs: WL $8.5 million divided by the terminal cap rate of 6.75%. The value in Year 7 is WL$ 125.93 million, discounting this value to the present:

FV = WL $125.93 million; N = 7, I/Y =10 results in a present value of WL $64.62 million.

WL $34.08 + WL $64.62 = WL $98.7 million.

3. Solution: C

NAVPS based on forecasted NOI:

Option #2 (REIT)	(in WL$ millions)
Recent NOI	140.0
Subtract: Non-cash rents	- 5.0
Add: Full-year adjustment for acquisition	+ 5.0
Pro forma cash NOI	140.0
Projected NOI @ 2.5% growth	143.5
Estimated value of operating real estate @ cap rate of 7.0%	2050.0
Add: Other assets	+ 50.0
Estimated gross value	2100.0
Subtract: Total liabilities	- 300.0

NAV	1800.0

NAVPS = 1800 / 15 = 120, which is lower than the current market price of WL $125.00. This REIT is selling at a premium to NAVPS.

4.   Solution: C.

Option 1 represents private investment in real estate, while Options 2 and 3 entail investing through public securities. Tax advantages can be enjoyed by direct investments in real estate, as well as through public securities. Similarly, use of leverage can be pursued by all three options. Option 1 does not have the problem of structural conflicts of interest that may be present in REITs (Option 2).

5.   Solution: A.

The terminal value estimate is 12.0 x WL $13.5 MM for end of year 7 or WL$ 162.0 MM. The discount rate is the cap rate of 7.0% plus the growth rate of 2.5%, or 9.5%. Discounting this terminal value to find the present value: FV = WL$ 162.0 MM; I/Y = 9.5; N = 7; PV = WL $85.83 MM. Add the present value of all dividends of WL $39.7 MM for a total of WL $125.53 MM. Divide WL$ 125-53 MM by 1 million shares outstanding for a value per share of WL $125-53.

6.   Solution: C.

Investment in both public REOCs and public REITs enjoy high liquidity, as shares of both trade on a stock exchange. Tax advantages favor REITs as REOCs are not tax-advantaged. REOCs are more reliant on capital appreciation due to their ability to reinvest cash flows, while REITs tend to have higher current income (i.e., yield).

Case 2: Horizon Yield (考点：Commodities and Commodity Derivatives: An Introduction)

1. Solution: B.

A speculator's goal is to take distinct market positions, deliberately taking on risk by betting on rising or falling prices. Billingsley took a long position in wheat futures, expecting to profit from an increase in the price of wheat. Billingsley may achieve the expected gains if the price of wheat increases, but he is also exposed to significant losses if the price of wheat falls. Therefore, Billingsley is a speculator.

A is incorrect because a market participant is classified as a hedger if an existing or expected cash position is compensated for via an opposite future. Billingsley did not enter into the wheat futures contracts to offset an existing or expected cash position.

C is incorrect because an arbitrageur tries to take advantage of time-or location-based price differences in commodity futures markets, or between spot and futures markets, in order to generate riskless profits. Billingsley's trades in wheat were long-only and were not riskless.

2. Solution: C.

Wheat is a consumable asset and this has its value determined primarily through global supply and demand factors.

A is incorrect because consumable assets do not generate income. As a result, interest rates have only a minor effect on their values.

B is incorrect because, in contrast to stocks and bonds, consumable assets do not generate continuous cash flows. As a result, cash flows are not a material factor in determining the value of consumable assets.

3. Solution: C.

Backwardation describes a term structure curve that has a negative trend (i.e. futures prices with longer time to maturity are lower than current spot prices). Exhibit 1 shows that the wheat price for delivery in December is lower than that of the spot price on 1 September. As a result, the forward curve is in backwardation.

A is incorrect because Exhibit1 shows that wheat for delivery in December is lower than the spot price on 1 September. As a result, the forward curve is in backwardation and not flat.

B is incorrect because in a contango situation, the futures price lies above the spot price. Exhibit 1 shows that wheat for delivery in Decembers lower than the spot price on 1 September

4. Solution: A.

Convenience yield is the monetary benefit from holding a commodity physically instead of being long the respective futures, and is affected in large part by inventory levels. Supply shortages increase the spot price and provide profit opportunities for holders of the commodities, thus increasing the convenience yield. Supply surpluses, on the other hand, decrease the spot price and the convenience yield.

B is incorrect because supply shortages increase the spot price and provide profit opportunities for holders of the commodities, thus increasing the convenience yield.

C is incorrect because a short-term change in the supply of a commodity would affect the convenience yield either positively or negatively; it would not remain the same.

5. Solution: B.

The roll return reflects the profit from the convergence of the futures price toward the spot price over time, and the subsequent rolling of the maturing futures into the next nearest month's futures contract. If the commodity market is in backwardation, the rolling from the maturing to the next shortest futures contract generates positive income. Because Billingsley is selling at the spot price ($4.50) and is buying at the lower futures price ($4.20), the roll return will be positive.

A is incorrect because the spot price ($4.50) is higher than the futures price ($4.20), so that the roll return will be positive, not zero.

C is incorrect because the spot price ($4.50) is higher than the futures price ($4.20), so that the roll return will be positive, not negative.

6. Solution: A.

Considering the storage theory, Nún-storable commodities are characterized by a high percentage of backwardation, while commodities with low storage costs, such as precious metals, are almost exclusively in contango.

B is incorrect because empirical evidence has verified the storage hypothesis, demonstrating that low-storage-cost cornrnodities are in contango the rnajority of the time

C is incorrect because a negative trending forward curve is indicative of a commodity in Backwardation, not contango.

Case 3: Shoshone (考点：Private Equity Valuation)

1. Solution: A.

Characteristic 3 describes venture capital investments, which are commonly the result of relationships between venture capitalists and entrepreneurs (existing shareholders or owners). Most buyout transactions are auctions, which involve multiple potential acquirers.

2. Solution: A.

Private equity firms may require that certain strategically important decisions (such as acquisitions or divestitures) be approved by the private equity firm, protecting its equity interests, not those of managers.

3. Solution: A.

A common source of value creation in leveraged buyouts is debt reduction.

4. Solution: C.

Liquidation is the route chosen if the company is no longer viable.

The exit route used for LUW, Inc., was a secondary market transaction at a price that indicated a strong company.

5. Solution: B.

Although the investment in Firm B produced a \$10 million profit in two years, that figure represents an annual return (internal rate of return, or IRR) of only 8.01% = (70 million/60 million)$^{1/2}$ − 1, which is below the hurdle rate. The general partner will not receive any carried interest payments until the fund's IRR exceeds the hurdle rate.

6. Solution: B.

Total value to paid in (TVPI) equals distributed to paid in (DPI) plus residual value to paid in (RVPI), where DPI is the sum of distributions divided by paid-in capital [(19+38)/125] = 0.46 and RVPI is NAV after distributions divided by paid-in capital (122.7/125) = 0.98. TVPI = 0.46 + 0.98 = 1.44.

Case 4: Julian Fuentes(考点：Private Real Estate Investments)

1. Solution: C.

While almost any private equity real estate investment will be unique (if for no other reason than that they must be in different locations), residential properties tend to have the fewest unique characteristics. Transactions-based indices tend to be more useful for residential commercial property benchmarking than for nonresidential commercial properties due to the large amount of data required for many properties and the unique features of many nonresidential commercial properties.

2. Solution: C.

Commercial uses with higher management involvement, such as restaurants, hotels, shopping centers, also have higher operational risks. One way to check this given the specifics in this case is to look at management fees as a percentage of effective gross income for the three properties.

Property #1   3.97%   ($145,000 I $3,652,000)

Property #2   3.99%   ($172,500 / $4,327,500)

Property #3   4.06%   ($138,288 / $3,407,557)

Therefore, Property #3 would be expected to have greater operational risk.

3. Solution: B.

Property #2 is an older office building with unique characteristics that could not be easily reproduced using current architectural designs and materials. Therefore, the cost approach would be less appropriate than the income approach as a basis for appraisal. The sales comparison approach would also be less suitable as the property is relatively unique.

4. Solution: B.

DCF valuation based on a required return of 9.5% is:

	NOI	Present Value
Year 1	$1,706,500	$1,558,447.49
Year 2	$1,774,760	$1,480,169.30
Year 3	$1,845,750	$1,405,822.60
Year 4	$1,919,580	$1,335,210.50
Year 5	$1,996,364	$1,268,145.64
Terminal value	$27,150,550	$17,246,780.74
Property #1	value	$24,294,576.27

Selected Calculation:

Terminal value is computed by applying the terminal cap rate to NOI in year 6. To estimate NOI for year 6, we need a growth rate estimate. We are not given the growth rate directly, but given the discount rate of 9.5% and the terminal cap rate of 7.5%, we can estimate the growth rate to be 2%.

$$TV_5 = NOI_5(1+g)/C_t = 1,996,364 \times (1+0.02)/0.075 = 27,150,550.40$$

Note: Make sure that you use the uneven cash flow function to compute NPV using your financial calculator.

5. Solution: A.

The maximum loan amount will typically be based on the lower of loan-to-value (LTV) or debt service coverage ratio. Based on LTV of 70%, ALIC would be willing to loan $21 million ($30 million x 0.70). Based on a debt service coverage ratio of 1.5x, ALIC will loan just under $20.7 million. ALIC will be willing to loan only an amount equal to the lower of these two measures.

The calculation for maximum debt service based on a minimum debt service coverage ratio of 1.5x is:

$$\text{Maximum debt service} = NOI_t/DSCR = 1,706,500/1.5 = 1,137,666.67$$

Maximum debt service on an interest-only loan can be used to calculate the maximum loan amount

$$\text{Maximum debt service Maximum loan} = \text{Maximum debt service/Interest rate}$$
$$= 1,137,666.67/0.055 = 20,684,848.48$$

6. Solution: B.

AIP should earn a higher return on equity by financing part of its purchase price with a mortgage because the cost of mortgage funds (5.5%) is less than the required return on equity (9.5%). Including the mortgage funding in a weighted-average cost of capital (WACC) will increase the value over the purchase price required if only equity funding is used.

Case 5: Eric Silverman Case Scenario(考点：Private Real Estate Investments)

1.   Solution: B.

B is correct. The investment committee is correct in that direct real investment will likely generate income and price appreciation, but their view on the diversification is incorrect. Real estate returns generally have low correlations with returns on other assets classes, such as stocks and bonds, and thus allow the endowment to diversify portfolio risk.

A is incorrect. Investors in direct real estate can expect to generate income by leasing or renting the property.

C is incorrect. Investors in direct real estate can expect price appreciation on the real estate investment.

2.   Solution: A.

A is correct. Dua is correct about factors that drive demand for office space and industrial and warehouse space but incorrect about retail space. Employment growth drives demand for office space, while warehouse space demand depends broadly on economic strength. The level of import and export activity is more directly related to demand for industrial and warehouse space, not retail space. Demand for retail space depends on consumer spending, job growth, and economic strength.

B is incorrect. Dua is correct about factors that drive demand for office space and industrial and warehouse space but incorrect about retail space.

C is incorrect. Dua is correct about factors that drive demand for and industrial and warehouse space.

3.   Solution: A.

A is correct. Under the DCF approach the value of the office property is the sum of the present value of lease payments (NOI) of $750,000 per year for 4 years plus the present value of the estimated resale value in Year 4.

PV of level NOI over 4 years:

$750000/1.075+750000/1.075^2+750000/1.075^3+750000/1.075^4 = \$2,511,994.70$

Year 5 NOI = 750,000 × (1.15) = $862,500

Estimated resale value after 4 years = ($862,500/0.055) = $15,681,818.18

PV of estimated resale value = [$15,681,818.18/(1.0754)] = $11,742.553.76

Current value of property = $2,511,994.70 + $11,742,553.76 = $14,254,548.46

C is incorrect. The estimated resale value is not discounted to PV. The current value of property is incorrectly calculated as $18,193,812.88 = $2,511,994.70/$15,681,818.18.

B is incorrect. Here the PV of NOI is incorrect, but the estimated resale value after 4 years is not discounted to PV and is incorrectly calculated.

PV of NOI =750000/1.055+750000/1.055²+750000/1.055³+750000/1.055 ⁴= $2,628,862.59

Estimated resale value after 4 years = ($750,000/0.055) = $13,636,363.64

Incorrect value of property = $16,265,226.23 = $2,628,862.59 + $13,636,363.64.

4. **Solution: C.**

C is correct. The calculation of the estimated property value using the cost approach is shown in the following table.

Market value (MV) of land	$2,500,000
Replacement building costs	$20,000,000
Curable physical depreciation costs	$500,000
Incurable physical depreciation costs	$3,500,000

Cost of modernizing heating and cooling system	$1,200,000
Estimated property value	$17,300,000

Estimated property value = MV of land + Replacement building costs − Curable physical depreciation costs − Incurable physical depreciations costs − Cost of modernizing heating and cooling system.

A is incorrect. This calculation excludes the market value of land.

B is incorrect. This calculation excludes the market value of land and does not deduct curable physical depreciation costs.

5. **Solution: A.**

A is correct. Using the sales comparison approach, the price PSF of the comparable properties is adjusted relative to the subject property to account for age and condition. For example, Property 1 is 10 years old, and the subject property is 7 years old. Because the subject property is newer by three years, the price PSF of Property 1 is adjusted up by 3% per year for three years, or 9%. Property 1 is in average condition, but the subject property is in excellent condition. Thus, the value of Property 1 is adjusted up 14%, the adjustment factor provided for the condition adjustment. Thus, the price PSF of Property 1 is adjusted up by 23% from $1,150: Adjusted price PSF for Property 1 = $1,150 × 1.23 = $1,415.50. A similar calculation is made for Property 2. The average adjusted price PSF of both properties is $1,403. The value of the subject property is calculated by applying $1,402.88 to the size of the property (12,000 square feet):

Value of subject property = $1,402.88 × 12,000 = $16,834,500

The following table shows the calculations:

Adjustment	Property 1	Property 2
Price PSF	$1,150	$1,325
Age	9.0%	−9.0%
Condition	14.0%	14.0%
Total	23.0%	5.0%
Adjusted price PSF	$1,414.50	$1,391.25
Average price PSF	$1,402.88	
Estimated value	$16,834,500	

B is incorrect. The adjustment for age is incorrect. Property 1 is adjusted down instead of up, and Property 2 is adjusted up instead of down.

Adjustment	Property 1	Property 2
Age	−9.0%	9.0%
Condition	14.0%	14.0%
Total	5.0%	23.0%
Adjusted PSF	$1,207.50	$1,629.75
Average	$1,418.63	
Value	$17,023,500	

C is incorrect. It is a simple average of the sales prices of Property 1 and Property 2.

Sales price Property 1 = 8,000 × $1,150 = $9,200,000

Sales price Property 2 = 14,000 × $1,325 = $18,550,000

6.   **Solution: A.**

A is correct. Although Lin is correct that the DCF method takes into account the cash flows that investors care about, she is not correct in stating that DCF takes into account the cyclical nature of the real estate market.

C is incorrect. Lin is correct about the cost approach.

B is incorrect. Lin is correct about the sales comparison approach.

10. Portfolio

Case 1: Sara Robinson and Marvin Gardner（考点：IPS）

1. Solution: C.

The investment process requires consideration of risk and return concurrently. While maximization of returns is always preferable, an investor's risk tolerance must also be determined and included in the investment decision. Recall that risk and return objectives are closely related to one another because of the trade-off between risk and return. Therefore, Statement 1 is incorrect, and Statement 4 is correct.

2. Solution: C.

Specific factors that determine an investor's ability to accept risk include required spending needs, financial strength, and long-term wealth targets. Behavioral factors affect an individual investor's willingness to accept risk.

3. Solution: C.

Strategic asset allocation requires investment managers to consider all sources of income and risk. It also requires an analysis of capital market conditions and specific risk and return characteristics of individual assets. Therefore, Statement 2 is incorrect, and Statement 3 is correct.

4. Solution: C.

Responses A and B are appropriate considerations related to tax considerations. Although investors should rely on accountants and other advisors for tax advice, portfolio managers also need to pay attention to the tax consequences of their investment recommendations and relay those consequences to the investor so proper tax planning can occur.

5. Solution: A.

The most important portfolio constraints faced by individual investors include liquidity, investment horizon, and unique needs. Legal and regulatory factors are less important for individual investors than they are for institutional investors.

6. Solution: B.

Investment policy statements should be transportable, foster discipline, and discourage short-term strategy shifts.

Case 2: Pearl Asset Management（考点：IPS, multifactor models, economic analysis, active security returns）

1. Solution: B.

What Yeung has identified as Constraint 1 is properly classified as a return objective and not a constraint. Investment constraints are factors that restrict investment choices. Constraint 2 is unexampled of time horizon constraint. Constraint 3 is an example of liquidity constraint.

2. Solution: B.

Macroeconomic models are based on surprises in macroeconomic data. Principal component analysis is used to identify the factors of a statistical factor model, which cannot necessarily be described using conventional economic variables. Fundamental factor models use firm-specific valuation metrics such as PE with standardized sensitivities.

3. Solution: C.

Information ratio for Lincoln fund = IR = active return/active risk = (7.6% - 6.5%)/5% = 0.22

Sharpe ratio of benchmark = SR_B = (6.5%-3%) / 11% = 0.32 The optimal amount of active risk can be calculated as:

$$\sigma_A^* = (IR/SR_B) \times \sigma_B = (0.22/0.32) \times 11.0\% = 7.56\%$$

The weight of the active Lincoln portfolio should be 7.56% / 5.0% = 1.51, and the weight on the benchmark portfolio would be 1 -1.51 =-0.51.

4. Solution: A.

The highest Sharpe ratio can be calculated using the relation $SR_p^2 = SR_B^2 + IR^2$:

$$SR_P = \sqrt{SR_B^2 + IR^2} = \sqrt{0.32^2 + 0.22^2} = 0.388$$

Thus, the highest Sharpe ratio that can be achieved by combining the active and passive portfolios is approximately 0.39.

5. Solution: B.

An asset whose value is negatively correlated to the investor's utility from future consumption provides a poor hedge against bad consumption outcomes. That is, the asset pays off more when the investor's utility is low. Such assets would command a higher risk premium.

6.   Solution: B.

For countries with high expected economic growth rates, real rates will be high. Investors will be less concerned about the future, and the inter-temporal rate of substitution will be low. Also, investors will want to increase current consumption and, hence, will borrow more and save less.

Case 3: Millennium Investments（考点：**Multifactor models, Economic analysis**）

1.   Solution: C.

E(R$_p$) = 0.6E(R$_{WMB}$) + 0.4E(R$_{REL}$) = 0.6(9%) + 0.4(10.8%) = 9.72%

2.   Solution: B.

$$\beta_{P,INF} = 0.6\beta_{WMB,INF} + 0.4\beta_{REL,INF} = 0.6(-2.2) + 0.4(-1.0) = -1.72$$

3.   Solution: A.

$$8 = E(R) + (-0.9 \times 0.5) + (1.2 \times 0.5) + (0.5)$$

E(R) = 7.35%

4.   Solution: B.

Consider portfolio A comprising 50% portfolio X and 50% portfolio Z. Portfolio A will have an expected return of 12.5% and a factor sensitivity of 1.25. A long position in portfolio A and short position in portfolio Y will have an expected return of 0.5% with zero factor sensitivity.

5.   Solution: B.

Active risk squared = active factor risk + active specific risk

6.   Solution: C.

Credit spreads tighten during times of economic expansions. During such times, lower-rated bonds outperform higher-rated bonds.

Case 4: Tamara Ogle（考点：Active security returns）

1. Solution: A.

$$E(R_A) = \sum w_{p,j} E(R_{p,j}) - \sum w_{B,j} E(R_{B,j}) = 11.07\% - 10.44\% = 0.63\%$$

2. Solution: C.

Both statements are correct. Information ratio, unlike the Sharpe ratio, is affected by an allocation to cash or by the use of leverage. For an unconstrained optimization, a change in aggressiveness in active weights changes both the active return and active risk proportionally, leaving the information ratio unchanged.

3. Solution: B.

IR(Dena) = IR(Orient)

$$(0.2) \times (0.99) \times \sqrt{12} = (0.25) \times (0.80) \times \sqrt{X}$$

$$\sqrt{X} = 3.429; X = 11.76$$

4. Solution: A.

Both statements are incorrect. The portfolio with the highest information ratio will have the highest Sharpe ratio. Recall that the Sharpe ratio of the portfolio is computed as $SR_p{}^2 = SR_B{}^2 + IR_p{}^2$. Given that benchmark Sharpe ratio (SR_B) is the same for all similar active portfolios, the active portfolio with the highest information ratio will also be the portfolio with the highest Sharpe ratio. The optimal active risk for a constrained portfolio=TC *optimal active risk for an unconstrained portfolio. Given that TC < 1 for constrained portfolio, the optimal active risk for a constrained portfolio will be lower than the optimal active risk for an unconstrained portfolio.

Case 5: Sally Sishek（考点：**market risk**）

1.   Solution: B.

VaR has been calculated using the parameters (mean and standard deviation) of the portfolio and assuming a distribution for portfolio risk factors. A historical simulation would instead identify actual returns from the portfolio and identify the 5th percentile.

2.   Solution: C.

To calculate the daily VaR from an annual VaR, the mean and standard deviation must be adjusted using the 250 trading days described.

The mean has been correctly calculated as 9.4% / 250 = 0.0376%

The standard deviation, however, should be divided by $\sqrt{250}$, 14.2% / $\sqrt{250}$ = 0.898%

This would result in a 5% daily VaR = |0.0376% — 1.65 x 0.898%| = 1.44%.

3.   Solution: B.

Liquidating a position when losses exceed a certain amount is an example of a stop loss limit.

4.   Solution: C.

Maximum drawdown is most commonly defined as the worst peak-to-trough decline in a portfolio's returns, or the worst-returning month or quarter for a portfolio. Maximum drawdown is an important risk measure for hedge funds. Redemption risk is a measure for open-end funds of the percentage of a portfolio could be redeemed at peak times.

5.   Solution: B.

The practice of driving the price in one direction with a series of small orders before executing a large order in the other direction is known as painting the tape.

6.   Solution: B.

Wash trading is a kind of market manipulation where the investor buys and sells the same financial instrument simultaneously, in order to simulate demand in the instrument by boosting trading volume. Placing a legitimate trade on one side of the market and several bogus orders on the other side of the market is known as layering. Entering large quantities of fictitious orders into the market and instantaneously canceling them is known as quote stuffing.

Case 6: Gordon Stenton（考点：**market risk**）

1.   Solution: A.

A monthly VaR cannot be annualized by simply multiplying by 12. The monthly return and standard deviation would need to be annualized and VaR recalculated. An assumption of a normal distribution is invalid if options were in the portfolio.

2.   Solution: B.

The estimated loss under the condition that VaR has been exceeded is known as conditional VaR.

3.   Solution: C.

The $225,000 is a minimum loss that will be exceeded 5% of the time. The maximum possible loss is the value of the portfolio.

4.   Solution: B.

The description is of reverse stress testing, which is a form of scenario analysis, not sensitivity analysis. A Monte Carlo simulation would run many repeated scenarios.

5.   Solution: C.

Execution algorithms are not designed to profit from arbitrage opportunities, rather they are used to minimize the impact of large trades by slicing them up into smaller trades and releasing to the market in stages.

6.   Solution: C.

Market fragmentation occurs when the number of venues trading the same instrument increases. As a response, algorithms are used to aggregate liquidity and route orders to the venues that have the best price and market depth.