

Question 1

L2EQ-TB0017-1412

LOS: LOS-8220

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

Which of the following statements regarding the Gordon Growth Model (GGM) applied to dividends is *least likely* to be accurate?

- ☐ The GGM can be used to value fixed-rate perpetual preferred stock.
- ☒ The GGM assumes that dividend yield grows in line with the constant growth rate g .
- ☐ The GGM assumes that the company value grows at the constant growth rate g .

Rationale

This Answer is Correct

The GGM assumes that both the dividends and the value of the company grow at the long-term sustainable growth rate g ; hence, the dividend yield, which is calculated as dividend/value, will be constant. The GGM can be used to value fixed-rate perpetual preferred stock by simply setting the growth rate to zero.

Question 2

L2R34TB-AC007-1512

LOS: LOS-8210

Lesson Reference: Lesson 1: Present Value Models

Difficulty: medium

The dividend discount model is most appropriate when a company has dividends that:

- ☐ grow at a different rate than earnings.
- ☐ are paid in a consistent dollar amount.
- ☒ represent a steady payout of earnings.

Rationale

grow at a different rate than earnings.

A key assumption of the DDM is that there is an identifiable relationship between dividends and earnings, for example, if dividends are a consistent proportion of earnings and cash flows. Choices A and B are incorrect because these scenarios do not imply a meaningful relationship between dividends and earnings; a consistent dollar amount while predictable may be meaningless in relation to earnings and cash flow.

Rationale

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Rationale

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Question 3

L2R34TB-AC021-1512

LOS: LOS-8330

Lesson Reference: Lesson 5: The Financial Determinants of Growth Rates

Difficulty: medium

Spreadsheet models:

- ☐ are cost-prohibitive for most purposes.
- ☐ are theoretically inferior to the DDM equations.
- ☒ allow for a detailed view of the drivers of dividend growth.

Rationale

✗ are cost-prohibitive for most purposes.

Although spreadsheet models are not practical for a multiple-choice exam, they give a more detailed view of earnings and growth rates than other models, and they allow for more careful estimation of changes in growth rates.

Rationale

✗ are theoretically inferior to the DDM equations.

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Rationale

✓ allow for a detailed view of the drivers of dividend growth.

Although spreadsheet models are not practical for a multiple-choice exam, they give a more detailed view of earnings and growth rates than other models, and they allow for more careful estimation of changes in growth rates.

Question 4

L2R34TB-AC015-1512

LOS: LOS-8350

Lesson Reference: Lesson 5: The Financial Determinants of Growth Rates

Difficulty: medium

A fair-value range is used to help assess the market value of a security relative to the price generated by a valuation model. To use it properly, the:

- ☒ stock price must fall with the range based on the price implied by the valuation model.
- ☐ result of the valuation model must fall within the range based on the current market price.
- ☐ range should be limited to the actual trading range over the past 12 months.

Rationale

☒ **stock price must fall with the range based on the price implied by the valuation model.**

The market price and the price generated by the valuation model will rarely if ever match. Instead, analysts are looking to see if the stock price is relatively close to the price generated by the model. The range is set based on the model. If the stock price falls within the range, then it is considered to be fairly valued.

Rationale

☐ **result of the valuation model must fall within the range based on the current market price.**

The market price and the price generated by the valuation model will rarely if ever match. Instead, analysts are looking to see if the stock price is relatively close to the price generated by the model. The range is set based on the model. If the stock price falls within the range, then it is considered to be fairly valued.

Rationale

☐ **range should be limited to the actual trading range over the past 12 months.**

The market price and the price generated by the valuation model will rarely if ever match. Instead, analysts are looking to see if the stock price is relatively close to the price generated by the model. The range is set based on the model. If the stock price falls within the range, then it is considered to be fairly valued.

Question 5

L2R34TB-AC011-1512

LOS: LOS-8310

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

Panther Industries will pay a dividend of \$0.75 per share this year. The dividend is expected to grow by 15% per year for the next three years, and then settle into a long-term growth rate of 8% indefinitely. The required rate of return is 12%. Using a two-stage DDM, the value of a share of Panther Industries' stock is *closest* to:

☐ \$21.95

☐ \$22.67

☒ \$24.29

Rationale

✗ \$21.95

Using the equation:

$$V_0 = \sum_{t=1}^n \frac{D_0(1+g_s)^t}{(1+r)^t} + \frac{D_0(1+g_s)^n(1+g_L)}{(1+r)^n(r-g_L)}$$

We can find the value as:

$$\begin{aligned} V_0 &= \frac{0.75(1.15)}{1.12} + \frac{0.75(1.15)^2}{1.12^2} + \frac{0.75(1.15)^3}{1.12^3} + \frac{0.75(1.15)^3(1.08)}{1.12^3(0.12-0.08)} \\ &= 0.7701 + 0.7907 + 0.8119 + 21.92 = \$24.29 \end{aligned}$$

Choice A incorrectly discounts the terminal value by four periods, not three. Choice B omits growing the dividend in the terminal value calculation.

Rationale

✗ \$22.67

Using the equation:

$$V_0 = \sum_{t=1}^n \frac{D_0(1+g_s)^t}{(1+r)^t} + \frac{D_0(1+g_s)^n(1+g_L)}{(1+r)^n(r-g_L)}$$

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$$\begin{aligned} V_0 &= \frac{0.75(1.15)}{1.12} + \frac{0.75(1.15)^2}{1.12^2} + \frac{0.75(1.15)^3}{1.12^3} + \frac{0.75(1.15)^3(1.08)}{1.12^3(0.12-0.08)} \\ &= 0.7701 + 0.7907 + 0.8119 + 21.92 = \$24.29 \end{aligned}$$

Choice A incorrectly discounts the terminal value by four periods, not three. Choice B omits growing the dividend in the terminal value calculation.

Rationale

✔ **\$24.29**

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Choice A incorrectly discounts the terminal value by four periods, not three. Choice B omits growing the dividend in the terminal value calculation.

Question 6

L2EQ-PQ3318-1411

LOS: LOS-8320

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

An analyst gathers the following information regarding Finesse Capital.

Current price = \$75

Current dividend = \$3.50

Short-term supernormal growth rate = 10%

Long-term sustainable growth rate = 5%

The supernormal growth in dividends is expected to linearly decline over a period of 6 years.

The required rate of return on the stock is *closest to*:

☒ 10.60%

☐ 10.83%

☐ 15.60%

Rationale

 **This Answer is Correct**

$$r = (D_0/P_0)[(1 + g_L) + H(g_S - g_L)] + g_L$$

$$r = (3.50/75) [1.05 + (6/2)(0.10 - 0.05)] + 0.05 = 10.60\%$$

Question 7

L2EQ-TBX109-1502

LOS: LOS-8320

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: easy

If a company raises its dividend and refinances its debt at a higher interest rate, the impact on free cash flow will be:

	FCFE	FCFF
A.	Unchanged	Unchanged
B.	Lower	Unchanged
C.	Lower	Lower

- ☐ Row A
- ☒ Row B
- ☐ Row C

Rationale

This Answer is Correct

An increase in dividend will not affect either FCFE or FCFF since payment of dividends is a use of free cash flow rather than a source of free cash flow. Higher interest charges will not affect FCFF, since it is calculated prior to any financing charges. FCFE is calculated post financing costs and, hence, will be lower in a higher interest rate environment.

Question 8

L200-PQ0024-1412

LOS: LOS-8200

Lesson Reference: Lesson 1: Present Value Models

Difficulty: medium

When considering the relative volatility of dividends versus equities, which of the following statements regarding the dividend discount model (DDM) is true?

- ☐ DDM values are more sensitive to short-term fluctuations and more reflective of the company's long-term value.
- ☒ DDM values are less sensitive to short-term fluctuations and more reflective of the company's long-term value.
- ☐ DDM values are less sensitive to short-term fluctuations and less reflective of the company's long-term value.

Rationale

 **This Answer is Correct**

DDM values are less sensitive to short-term fluctuations and more reflective of the company's long-term value.

Question 9

L2EQ-PQ3308-1411

LOS: LOS-8210

Lesson Reference: Lesson 2: The Dividend Discount Model

Difficulty: medium

Caroline wants to invest in the stock of Getsmart Pharma, which is currently trading at \$67.20. The company is expected to pay dividends of \$2.80, \$3.36, \$4.03, \$4.84, and \$5.81 at the end of each of the next 5 years. Analysts expect the stock to trade at \$79.50 after 5 years. Given a required rate of return of 11%, the stock is *most likely*:

- ☐ Undervalued
- ☒ Overvalued
- ☐ Fairly valued

Rationale

✔ **This Answer is Correct**

TI BA II Plus calculator keystrokes:

[CF] [2nd] [CE|C]

[Enter] [↓]

2.80 [Enter] [↓] [↓]

3.36 [Enter] [↓] [↓]

4.03 [Enter] [↓] [↓]

4.84 [Enter] [↓] [↓]

85.31 [Enter]

[NPV] 11 [Enter] [↓] [CPT]

NPV = \$62.01

The stock is currently trading at a price which is higher than its intrinsic value, so it is overvalued.

Question 10

L2EQ-PQ3310-1411

LOS: LOS-8220

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

Chris is considering investing in the stock of Gamma Corporation, which is currently trading at \$13.80 per share. The stock recently paid a dividend of \$2.25; however, due to a poor industry outlook, dividends are expected to decline at a rate of 7% forever. Given a required rate of return of 12%, the stock is *most likely*:

- ☐ Undervalued
- ☒ Overvalued
- ☐ Fairly valued

Rationale

✔ This Answer is Correct

$$V_0 = D_1 / (r - g)$$

$$V_0 = [2.25 \times (1 - 0.07)] / [0.12 - (-0.07)] = \$11.01$$

Question 11

L2R34TB-AC022-1512

LOS: LOS-8220

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVG0), and P/E Ratios

Difficulty: medium

Phoenix Processing is expected to have a dividend of \$0.85 next year. It has a steady long-term growth rate of 8%. The risk-free rate of return is 3%, the equity risk premium is 7%, and Phoenix's beta against the market index is 0.90. Using the Gordon growth model, the value of the company's stock is *closest* to:

- ☐ \$9.14
- ☒ \$65.38
- ☐ \$70.62

Rationale

 **\$9.14**

Start by finding the required rate of return using the CAPM:

$$r_e = r_f + \beta(r_p) = 0.03 + 0.90(0.07) = 0.093$$

Using the Gordon growth model, estimate the value of the stock.

$$V_0 = \frac{D_1}{r - g} = \frac{0.85}{0.093 - 0.08} = 65.38$$

Choice A is the value of the stock; if the dividend is simply capitalized by the required rate of return, no growth is taken into consideration. Choice C grows the dividend, which is not necessary because the dividend is already D_1 .

Rationale

 **\$65.38**

Start by finding the required rate of return using the CAPM:

$$r_e = r_f + \beta(r_p) = 0.03 + 0.90(0.07) = 0.093$$

Using the Gordon growth model, estimate the value of the stock.

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Choice A is the value of the stock; if the dividend is simply capitalized by the required rate of return, no growth is taken into consideration. Choice C grows the dividend, which is not necessary because the dividend is already D_1 .

Rationale

✖ \$70.62

Start by finding the required rate of return using the CAPM:

$$r_e = r_f + \beta(r_p) = 0.03 + 0.90(0.07) = 0.093$$

Using the Gordon growth model, estimate the value of the stock.

$$V_0 = \frac{D_1}{r - g} = \frac{0.85}{0.093 - 0.08} = 65.38$$

Choice A is the value of the stock; if the dividend is simply capitalized by the required rate of return, no growth is taken into consideration. Choice C grows the dividend, which is not necessary because the dividend is already D_1 .

Question 12

L2R34TB-AC027-1512

LOS: LOS-8300

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

An analyst reviews shares of Spartan Sprockets Company. He finds that the present value of the estimated dividends for the first five years of his analysis is \$3.97, with a year-five dividend of \$1.05. In year 6 and beyond, he assumes a long-term growth rate of 5%. The required rate of return is 14%. He concludes the terminal value is *closest* to:

- ☐ \$6.36
- ☐ \$11.67
- ☒ \$12.25

Rationale

✗ **\$6.36**

The terminal value is the future value of the dividends that pay in year 6 and beyond. If the dividend in year 5 is \$1.05 and the growth rate is 5%, the year six dividend is $1.05(1.05) = \$1.10$.

Then, use the Gordon growth model to find the terminal value based on this dividend:

$$\begin{aligned} V_0 &= \frac{D_1}{r-g} \\ TV_5 &= \frac{D_6}{r-g} = \frac{1.10}{0.14-0.05} = \$12.25 \end{aligned}$$

Choice A is the present value of the terminal value and choice B uses the fifth year dividend in the numerator of the Gordon growth model; it omits $(1 + g)$.

Rationale

✗ **\$11.67**

The terminal value is the future value of the dividends that pay in year 6 and beyond. If the dividend in year 5 is \$1.05 and the growth rate is 5%, the year six dividend is $1.05(1.05) = \$1.10$.

Then, use the Gordon growth model to find the terminal value based on this dividend:

$$\begin{aligned} V_0 &= \frac{D_1}{r-g} \\ TV_5 &= \frac{D_6}{r-g} = \frac{1.10}{0.14-0.05} = \$12.25 \end{aligned}$$

Choice A is the present value of the terminal value and choice B uses the fifth year dividend in the numerator of the Gordon growth model; it omits $(1 + g)$.

Rationale

✔ \$12.25

The terminal value is the future value of the dividends that pay in year 6 and beyond. If the dividend in year 5 is \$1.05 and the growth rate is 5%, the year six dividend is $1.05(1.05) = \$1.10$.

Then, use the Gordon growth model to find the terminal value based on this dividend:

$$V_0 = \frac{D_1}{r-g}$$
$$TV_5 = \frac{D_6}{r-g} = \frac{1.10}{0.14-0.05} = \$12.25$$

Choice A is the present value of the terminal value and choice B uses the fifth year dividend in the numerator of the Gordon growth model; it omits $(1 + g)$.

Question 13

L2EQ-PQ3322-1411

LOS: LOS-8340

Lesson Reference: Lesson 5: The Financial Determinants of Growth Rates

Difficulty: medium

An analyst gathered the following information regarding a company:

Return on assets = 18%

Asset turnover = 13%

Dividend payout ratio = 60%

Equity multiplier = 1.35

The company's sustainable growth rate is *closest to*:

- ☒ 9.72%
- ☐ 14.58%
- ☐ 12.64%

Rationale

 **This Answer is Correct**

Sustainable growth rate = ROA × Retention rate × Equity multiplier

Sustainable growth rate = $0.18 \times (1 - 0.60) \times 1.35 = 9.72\%$

Question 14

L200-PQ0026-1412

LOS: LOS-8210

Lesson Reference: Lesson 2: The Dividend Discount Model

Difficulty: medium

When classifying dividend streams into one of several stylized growth patterns, which of the following methods does not apply?

- ☒ Constant growth for a finite period (the Gordon growth model)
- ☐ Two distinct stages of growth (the two-stage growth model and the H-model)
- ☐ Three distinct stages of growth (three-stage models)

Rationale

 **This Answer is Correct**

The Gordon growth model assumes constant growth in dividends forever, not for a finite period.

Question 15

L2R34TB-AC012-1512

LOS: LOS-8320

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

The rate of return on Treasury bills is 3.5%. The premium over Treasury bills for the S&P 500 Index is 8.5%. Given this, a stock with a beta of 1.15 would have a required rate of return *closest* to:

- ☐ 9.78%
- ☐ 12.53%
- ☒ 13.28%

Rationale

✗ 9.78%

Using the CAPM, $r_e = r_f + \beta(r_p)$, the rate of return is $0.035 + (1.15 \times 0.085) = 0.13275 = 13.28\%$. 9.78% only adjusts the risk premium for beta, omitting the rate of return on Treasury bills. 12.53% incorrectly applies beta to the rate of return on Treasury bills, not the risk premium.

Rationale

✗ 12.53%

Using the CAPM, $r_e = r_f + \beta(r_p)$, the rate of return is $0.035 + (1.15 \times 0.085) = 0.13275 = 13.28\%$. 9.78% only adjusts the risk premium for beta, omitting the rate of return on Treasury bills. 12.53% incorrectly applies beta to the rate of return on Treasury bills, not the risk premium.

Rationale

✓ 13.28%

Using the CAPM, $r_e = r_f + \beta(r_p)$, the rate of return is $0.035 + (1.15 \times 0.085) = 0.13275 = 13.28\%$. 9.78% only adjusts the risk premium for beta, omitting the rate of return on Treasury bills. 12.53% incorrectly applies beta to the rate of return on Treasury bills, not the risk premium.

Question 16

L2R34TB-AC009-1512

LOS: LOS-8230

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVG0), and P/E Ratios

Difficulty: medium

Sparky Industries posted a dividend of \$1.15 in 2011, \$1.18 in 2012, and \$1.30 in 2013. What is the compound annual growth rate in the dividends?

- ☐ 4.17%
- ☒ 6.32%
- ☐ 13.04%

Rationale

 **4.17%**

To find the compound annual growth rate (CAGR), divide the ending period result by the beginning period result, then find the root based on the number of years after the first year and finally subtract 1:

$$S_0, (1.30/1.15)^{1/2} - 1 = 0.0632 = 6.32\%$$

4.17% incorrectly uses three for the number of years instead of two. 13.04% is the percent change between 2011 and 2013, not the CAGR.

Rationale

 **6.32%**

To find the compound annual growth rate (CAGR), divide the ending period result by the beginning period result, then find the root based on the number of years after the first year and finally subtract 1:

$$S_0, (1.30/1.15)^{1/2} - 1 = 0.0632 = 6.32\%$$

4.17% incorrectly uses three for the number of years instead of two. 13.04% is the percent change between 2011 and 2013, not the CAGR.

Rationale

 **13.04%**

To find the compound annual growth rate (CAGR), divide the ending period result by the beginning period result, then find the root based on the number of years after the first year and finally subtract 1:

$$S_0, (1.30/1.15)^{1/2} - 1 = 0.0632 = 6.32\%$$

4.17% incorrectly uses three for the number of years instead of two. 13.04% is the percent change between 2011 and 2013, not the CAGR.

Question 17

L2EQ-TB0018-1412

LOS: LOS-8230

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

A company has a required rate of return on equity of 11.2% and the current dividend is \$3. If the current price of the stock is \$65, the growth rate in dividends implied by the market price is closest to:

- ☒ 6.3%.
- ☐ 6.6%.
- ☐ 15.8%.

Rationale

✔ This Answer is Correct

The GGM states that

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

Hence, in this case

$$\begin{aligned} 65 &= 3(1 + g)/(0.112 - g) \\ 65(0.112 - g) &= 3(1 + g) \\ 7.28 - 65g &= 3 + 3g \\ 4.28 &= 68g \\ G &= 4.28/68 = 6.3\% \end{aligned}$$

Alternatively, a quicker solution may be to simply substitute values for g into the model to see which value gives a market price of \$65.

Question 18

L2R34TB-AC019-1512

LOS: LOS-8340

Lesson Reference: Lesson 5: The Financial Determinants of Growth Rates

Difficulty: medium

Big Red Incorporated will pay a dividend of \$0.32 next year on earnings per share of \$2.00. The company's shareholders' equity is \$75,000,000 and it has 5,000,000 shares outstanding. What is Big Red's sustainable growth rate?

- ☐ 2.1%
- ☒ 11.2%
- ☐ 13.3%

Rationale

 **2.1%**

The sustainable growth rate is $g = (b, \text{the mature retention rate}) \times (\text{mature ROE})$. Start by finding the dividend payout, $\$0.32/\$2.00 = 0.16$.

The retention rate is $1 - \text{payout}$, or $1 - 0.16 = 0.84$.

To find the ROE, start by finding equity per share: $\$75 \text{ mil} / 5 \text{ mil} = \15 per share . The return per share on that equity per share is $\$2.00/\$15.00 = 0.1333$.

Combine these numbers into the growth rate equation, $g = b \times \text{ROE}$, and the growth rate equals $0.84 \times 0.1333 = 0.112 = 11.2\%$.

Rationale

 **11.2%**

The sustainable growth rate is $g = (b, \text{the mature retention rate}) \times (\text{mature ROE})$. Start by finding the dividend payout, $\$0.32/\$2.00 = 0.16$.

The retention rate is $1 - \text{payout}$, or $1 - 0.16 = 0.84$.

To find the ROE, start by finding equity per share: $\$75 \text{ mil} / 5 \text{ mil} = \15 per share . The return per share on that equity per share is $\$2.00/\$15.00 = 0.1333$.

Combine these numbers into the growth rate equation, $g = b \times \text{ROE}$, and the growth rate equals $0.84 \times 0.1333 = 0.112 = 11.2\%$.

Rationale

✖ 13.3%

The sustainable growth rate is $g = (b, \text{the mature retention rate}) \times (\text{mature ROE})$. Start by finding the dividend payout, $\$0.32/\$2.00 = 0.16$.

The retention rate is $1 - \text{payout}$, or $1 - 0.16 = 0.84$.

To find the ROE, start by finding equity per share: $\$75 \text{ mil} / 5 \text{ mil} = \15 per share . The return per share on that equity per share is $\$2.00/\$15.00 = 0.1333$.

Combine these numbers into the growth rate equation, $g = b \times \text{ROE}$, and the growth rate equals $0.84 \times 0.1333 = 0.112 = 11.2\%$.

Question 19

L2EQ-PQ3301-1411

LOS: LOS-8210

Lesson Reference: Lesson 2: The Dividend Discount Model

Difficulty: medium

Joshua wants to purchase the stock of Dingo Ltd., which is currently trading at \$31.29. He expects the company's earnings next year to be \$2.08, at which time he expects to be able to sell the stock for \$33.80. Given a required rate of return of 12% and that the company retains 40% of its earnings, the stock is *most likely*:

☐ Undervalued

☐ Overvalued

☒ Fairly valued

Rationale

✔ **This Answer is Correct**

$$D_1 = \$2.08 \times (1 - 0.4) = \$1.248$$

$$V_0 = (D_1 + P_1) / (1 + r)^1$$

$$V_0 = (1.248 + 33.80) / 1.12 = \$31.29$$

The stock is currently trading at its intrinsic value of \$31.29, so it is fairly valued.

Question 20

L2R34TB-AC023-1512

LOS: LOS-8250

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

Redbird Corporation has earnings per share this year of \$1.50 with a 33% payout rate. It has a steady long-term growth rate of 10%. The risk-free rate of return is 3%, the equity risk premium is 7%, and its beta against the market index is 1.20. The justified trailing P/E is *closest* to:

- ☐ 77.1x
- ☒ 25.7x
- ☐ 23.4x

Rationale

✗ 77.1x

Start by finding next year's dividend. It will be based on earnings that grow by 10% and a 33% payout, so $1.50 \times 1.10 \times .33 = 0.54$.

The return on equity based on the information given is 11.4% [using CAPM $11.4\% = 3\% + (1.2)7\%$]. Using the Gordon growth model, the current stock value is estimated as:

$$V_0 = \frac{D_1}{r - g} = \frac{0.54}{0.114 - 0.10} = \$38.57$$

Divide the estimated value by current earnings, $\$38.57/\1.50 , for a trailing P/E₀ of 25.7x.

Choice A incorrectly calculates P/E₀ using the D₀ in the denominator. Choice C uses E_1 (grow earnings by 10%).

Rationale

✓ 25.7x

Start by finding next year's dividend. It will be based on earnings that grow by 10% and a 33% payout, so $1.50 \times 1.10 \times .33 = 0.54$.

The return on equity based on the information given is 11.4% [using CAPM $11.4\% = 3\% + (1.2)7\%$]. Using the Gordon growth model, the current stock value is estimated as:

$$V_0 = \frac{D_1}{r - g} = \frac{0.54}{0.114 - 0.10} = \$38.57$$

Divide the estimated value by current earnings, $\$38.57/\1.50 , for a trailing P/E₀ of 25.7x.

Choice A incorrectly calculates P/E0 using the D0 in the denominator. Choice C uses £1 (grow earnings by 10%).

Rationale

✖ 23.4x

Start by finding next year's dividend. It will be based on earnings that grow by 10% and a 33% payout, so $1.50 \times 1.10 \times .33 = 0.54$.

The return on equity based on the information given is 11.4% [using CAPM $11.4\% = 3\% + (1.2)7\%$]. Using the Gordon growth model, the current stock value is estimated as:

$$V_0 = \frac{D_1}{r - g} = \frac{0.54}{0.114 - 0.10} = \$38.57$$

Divide the estimated value by current earnings, $\$38.57/\1.50 , for a trailing P/E₀ of 25.7x.

Choice A incorrectly calculates P/E0 using the D0 in the denominator. Choice C uses £1 (grow earnings by 10%).

Question 21

L2EQ-ITEMSET-PQ3311-1411

LOS: LOS-8250

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Use the following information to answer the next 2 questions:

An analyst gathered the following information regarding Alturius Inc.

Current market price per share = \$29.48

Current year EPS = \$3.18

Current year dividend per share = \$1.272

Required rate of return on equity = 12%

Dividends are expected to grow at a rate of 6.5% forever.

i.

The company's justified leading P/E ratio is *closest to*:

☐ 7.75

☒ 7.27

☐ 10.91

Rationale

✔ This Answer is Correct

Justified leading P/E = $(1 - b) / (r - g)$

Dividend payout ratio = $D / E = 1.272 / 3.18 = 0.4$

Justified leading P/E = $0.4 / (0.12 - 0.065) = 7.27$

ii.

Based on the justified trailing P/E ratio, the stock is *most likely*:

☐ Undervalued

☒ Overvalued

☐ Fairly valued

Rationale

✔ This Answer is Correct

Justified trailing P/E = $(0.40 \times 1.065) / (0.12 - 0.065) = 7.75$

Trailing P/E based on market price = $29.48 / 3.18 = 9.27$

Since the company's trailing P/E based on the market price is greater than its justified trailing P/E, it is overvalued.

Question 22

L2EQ-TBB213-1412

LOS: LOS-8280

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

An analyst expects the dividends of a company to fall by 15% for five years, when the company will undergo a restructuring and pay a special dividend to shareholders. Post the restructuring, dividends are expected to remain stable for five years before a period of sustainable growth of 3% begins in perpetuity. Which of the following approaches would *most likely* be best suited to value the company based on the present value of expected dividend payments?

- ☐ The H-model.
- ☒ Spreadsheet modeling.
- ☐ The Gordon growth model.

Rationale

This Answer is Correct

The company has a nonstandard pattern of dividends that would most easily be assessed using a spreadsheet model. While the Gordon growth model may be used to estimate a terminal value, it would be very cumbersome to value the other dividends prior to the period of perpetual growth without using a spreadsheet.

The next two questions relate to the following information:

Adriana Inc. has reported the following figures in its most recent financial statements (amounts are in \$m):

Net income	244
Depreciation charge	330
Interest expense	110
Increase in inventories	33
Increase in accounts receivable	44
Decrease in accounts payable	50
Cash flow used for investing activities	440
Tax rate	40%
Net borrowing	80

Question 23

L2EQ-PQ3321-1411

LOS: LOS-8320

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

The stock of Tulip Inc. is currently trading at \$78.30 per share. The company recently paid a dividend of \$1.50 per share. The current dividend growth rate of 12% is expected to decline linearly over the next 6 years to a long-term constant growth rate of 5%. Given that the stock is fairly priced, the required rate of return on the stock is *closest to*:

- ☐ 2.41%
- ☒ 7.41%
- ☐ 14.41%

Rationale

✔ **This Answer is Correct**

$$\text{Required return} = \{(D_0 / P_0) [(1 + g_L) + H (g_S - g_L)]\} + g_L$$

$$\text{Required return} = \{(1.50 / 78.30) [(1 + 0.05) + 6/2 (0.12 - 0.05)]\} + 0.05$$

$$\text{Required return} = 7.4138\%$$

Question 24

L2R34TB-ITEMSET-AC004-1512

LOS: LOS-8300

LOS: LOS-8310

LOS: LOS-8230

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

Use the following information to answer the next 3 questions:

Cowboy Corporation is a global food processing company that pays semiannual dividends. It paid total dividends of \$0.12 in 2012, \$0.16 in 2013, and \$0.21 in 2014. Charles Gibbs, CFA, is an analyst reviewing Cowboy Corporation as part of his equity firm's annual review process. To determine the required rate of return on equity for his analysis of Cowboy, Gibbs uses the risk free rate of return of 2.8%, an equity risk premium of 6.4%, and a beta of 1.05.

Gibbs believes that the growth rate in earnings for Cowboy will be 20% for 2015–2018, and then decline as the company's markets become more mature. He is curious to see how different assumptions about the rate and nature of the decline in the growth rate will affect the company's terminal value. Specifically, Gibbs wants to assess the effect of the dividend growth rate given the following scenarios:

1. After a 20% growth rate beginning in 2015, the dividend growth rate immediately declines to 8 percent in 2019 and stays at that rate indefinitely.
2. After a 20% growth rate beginning in 2015, the dividend growth rate declines linearly from the 20 percent rate in 2018 to 6 percent in 2024.

One question he considers is how to model the company. Although Gibbs thinks that the two scenarios in question will give a good range of possible prices, Gibbs' supervisor is concerned about over-simplifying a complex situation. He would prefer that the analyst do a detailed spreadsheet to show the drivers for growth, as he believes that understanding those will give better valuation information than a number coming out of an equation.

i.

Using the two-stage DDM, the terminal value of the stock that Gibbs determines under scenario 1 will be *closest to*:

- ☐ \$21.51
- ☐ \$22.57
- ☒ \$30.94

Rationale

 **This Answer is Correct**

Using the CAPM, the required rate of return is:

$$r_e = r_f + B(r_p) = 0.028 + 1.05(0.064) = 0.0952 = 9.52\%$$

The two-stage DDM can be used to find the value of the stock:

$$\begin{aligned} V_0 &= \sum_{t=1}^n \frac{D_0(1+g_s)^t}{(1+r)^t} + \frac{D_0(1+g_s)^n(1+g_L)}{(1+r)^n(r-g_L)} \\ &= \frac{0.21(1.20)}{1.0952} + \frac{0.21(1.20)^2}{(1.0952)^2} + \frac{0.21(1.20)^3}{(1.0952)^3} + \frac{0.21(1.20)^4}{(1.0952)^4} + \frac{0.21(1.20)^4(1.08)}{(1.0952)^4(0.0952-0.08)} = \$22.57 \end{aligned}$$

Note it is the second term that calculates and discounts the terminal value. Undiscounted, the terminal value is the last term's numerator divided by $(r - g_L)$:

$$\text{Terminal value} = \frac{0.21(1.20)^4(1.08)}{(0.0952 - 0.08)} = \$30.94$$

Choices A and B are the present value of the terminal value and the value of the stock, respectively.

Rationale

✔ This Answer is Correct

Using the CAPM, the required rate of return is:

$$r_e = r_f + B(r_p) = 0.028 + 1.05(0.064) = 0.0952 = 9.52\%$$

The two-stage DDM can be used to find the value of the stock:

$$\begin{aligned} V_0 &= \sum_{t=1}^n \frac{D_0(1+g_s)^t}{(1+r)^t} + \frac{D_0(1+g_s)^n(1+g_L)}{(1+r)^n(r-g_L)} \\ &= \frac{0.21(1.20)}{1.0952} + \frac{0.21(1.20)^2}{(1.0952)^2} + \frac{0.21(1.20)^3}{(1.0952)^3} + \frac{0.21(1.20)^4}{(1.0952)^4} + \frac{0.21(1.20)^4(1.08)}{(1.0952)^4(0.0952-0.08)} = \$22.57 \end{aligned}$$

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Using the CAPM, the required rate of return is:

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$$\text{Terminal value} = \frac{0.21(1.20)^4(1.08)}{(0.0952 - 0.08)} = \$30.94$$

Choices A and B are the present value of the terminal value and the value of the stock, respectively.

ii.

Using the H-model, the value of the stock under scenario 2 will be *closest to*:

- ☐ \$19.37
- ☒ \$13.79
- ☐ \$12.73

Rationale

 **This Answer is Incorrect**

Using the CAPM, the required rate of return is:

$$r_e = r_f + B(r_p) = 0.028 + 1.05(0.064) = 0.0952 = 9.52\%$$

The dividends from 2015 to 2018 are valued using the standard DDM:

$$\begin{aligned} V_0 &= \frac{D_1}{(1+r)^1} + \dots + \frac{D_n}{(1+r)^n} \\ V_0 &= \sum_{t=1}^n \frac{0.21(1.20)^t}{1.0952^t} + \frac{0.21(1.20)^2}{(1.0952)^2} + \frac{0.21(1.20)^3}{(1.0952)^3} + \frac{0.21(1.20)^4}{(1.0952)^4} \\ V_0 &= 0.2301 + 0.2521 + 0.2762 + 0.3027 = 1.0611 \end{aligned}$$

To use the H-model, substitute the 2018 dividend D_4 (\$0.4355) as the dividend D_0 and determine the terminal value:

$$TV_4 = \frac{D_0(1+g_L) + D_0H(g_s - g_L)}{r - g_L} = \frac{0.4355(1+0.06) + 0.4355(3)(0.20 - 0.06)}{0.0952 - 0.06} = \$18.31$$

The present value of the terminal value is $\$18.31/(1+r)^4 = \12.73 . Add this to the present value of D_1 through D_4 , which is $\$1.0611$, for a total present value of $\$13.79$.

Choice A does not discount the terminal value to the present value. It adds the present value of D_1 through D_4 ($\$1.0611$) to the terminal value of $\$18.31$. Choice C is the present value of the terminal value; it omits adding the present value of the D_1 through D_4 to come up with the price of the stock.

Rationale

 **This Answer is Incorrect**

Using the CAPM, the required rate of return is:

$$r_e = r_f + B(r_p) = 0.028 + 1.05(0.064) = 0.0952 = 9.52\%$$

The dividends from 2015 to 2018 are valued using the standard DDM:

$$\begin{aligned} V_0 &= \frac{D_1}{(1+r)^1} + \dots + \frac{D_n}{(1+r)^n} \\ V_0 &= \sum_{t=1}^n \frac{0.21(1.20)^t}{1.0952^t} = \frac{0.21(1.20)}{1.0952} + \frac{0.21(1.20)^2}{(1.0952)^2} + \frac{0.21(1.20)^3}{(1.0952)^3} + \frac{0.21(1.20)^4}{(1.0952)^4} \\ V_0 &= 0.2301 + 0.2521 + 0.2762 + 0.3027 = 1.0611 \end{aligned}$$

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Rationale

 **This Answer is Incorrect**

Using the CAPM, the required rate of return is:

$$r_e = r_f + B(r_p) = 0.028 + 1.05(0.064) = 0.0952 = 9.52\%$$

The dividends from 2015 to 2018 are valued using the standard DDM:

$$V_0 = \frac{D_1}{(1+r)^1} + \dots + \frac{D_n}{(1+r)^n}$$
$$V_0 = \sum_{t=1}^n \frac{0.21(1.20)^t}{(1.0952)^t} = \frac{0.21(1.20)}{(1.0952)} + \frac{0.21(1.20)^2}{(1.0952)^2} + \frac{0.21(1.20)^3}{(1.0952)^3} + \frac{0.21(1.20)^4}{(1.0952)^4}$$
$$V_0 = 0.2301 + 0.2521 + 0.2762 + 0.3027 = 1.0611$$

To use the H-model, substitute the 2018 dividend D_4 (\$0.4355) as the dividend D_0 and determine the terminal value:

$$TV_4 = \frac{D_0(1 + g_L) + D_0H(g_s - g_L)}{r - g_L} = \frac{0.4355(1 + 0.06) + 0.4355(3)(0.20 - 0.06)}{0.0952 - 0.06} = \$18.31$$

The present value of the terminal value is $\$18.31/(1 + r)^4 = \12.73 . Add this to the present value of D_1 through D_4 , which is \$1.0611, for a total present value of \$13.79.

Choice A does not discount the terminal value to the present value. It adds the present value of D_1 through D_4 (\$1.0611) to the terminal value of \$18.31. Choice C is the present value of the terminal value; it omits adding the present value of the D_1 through D_4 to come up with the price of the stock.

iii.

The analyst's supervisor is curious to know what happens if 20% growth ends in 2016 instead of 2018. All else being equal, *most likely* the:

- ☐ total value of the shares will increase.
- ☐ value of the early dividends will become more important.
- ☒ terminal value will become a larger share of the present value.

Rationale

✗ This Answer is Incorrect

If the high growth period (first stage) is shorter, the terminal value will be received earlier and will become a larger share of the present value.

Rationale

✗ This Answer is Incorrect

If the high growth period (first stage) is shorter, the terminal value will be received earlier and will become a larger share of the present value.

Rationale

✗ This Answer is Incorrect

If the high growth period (first stage) is shorter, the terminal value will be received earlier and will become a larger share of the present value.

Question 25

L2EQ-TB0019-1412

LOS: LOS-8240

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

A stock has a forward P/E ratio of 12 and a required rate of return of 12%. Which of the following is closest to the component of the P/E value that relates to growth opportunities?

- ☒ 3.7.
- ☐ 8.3.
- ☐ 12.0.

Rationale

This Answer is Correct

The leading P/E ratio can be expressed as $(1 / r) + (PVGO / E_1)$, where $(1 / r)$ is the value of the P/E for a no-growth company and $(PVGO / E_1)$ is the component of the P/E ratio that relates to growth opportunities. In this case:

$$12 = (1 / 0.12) + \text{growth opportunities component}$$

$$12 = 8.3 + \text{growth opportunities component}$$

This implies the component of the P/E value that relates to growth opportunities is 3.7

Question 26

L2EQ-PQ3314-1411

LOS: LOS-8300

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

Sasha Hemmington is analyzing the stock of Jeremy Traders. She expects the company's current annual dividend of \$1.20 to grow at a rate of 12% for the next five years and then stabilize at a long-term growth rate of 6%. The company's trailing P/E ratio at the end of the initial high-growth period is expected to be 10, and its retention rate is expected to be 40%. The required rate of return on the company's stock is 13%. The terminal value of the stock at the end of Year 5, based on the Gordon growth model and the earnings multiple approach, is *closest* to:

Gordon Growth Model Earnings Multiple Approach

A	\$32.02	\$35.25
B	\$34.14	\$52.87
C	\$32.02	\$52.87

- ☒ Row A
☐ Row B
☐ Row C

Rationale

✔ This Answer is Correct

Terminal value based on the Gordon growth model:

$$P_5 = D_6 / (r - g)$$

$$P_5 = [(1.20 \times 1.12^5) \times 1.06] / (0.13 - 0.06) = \$32.02$$

Terminal value based on the earnings multiple approach:

$$D_5 = 1.20 \times 1.12^5 = \$2.1148$$

$$D_5 = E_5 \times \text{Payout rate}$$

$$E_5 = 2.1148 / (1 - 0.4) = \$3.5247$$

$$P_5 = P_5 / E_5 \times E_5$$

$$P_5 = 10 \times 3.5247 = \$35.25$$

Question 27

L2EQ-PQ3313-1411

LOS: LOS-8260

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

Octimus Inc. has a \$100 par fixed-rate perpetual preferred stock outstanding with a dividend of 7%. The stock is currently trading for \$56.36. Given a required rate of return of 11%, the stock is *most likely*:

- ☒ Undervalued
- ☐ Overvalued
- ☐ Fairly valued

Rationale

 **This Answer is Correct**

Dividend = $0.07 \times \$100 = \7

Value of preferred stock = $7 / 0.11 = \$63.64$

The stock's current market price is lower than its intrinsic value; therefore, it is undervalued.

Question 28

L2R34TB-ITEMSET-AC001-1512

LOS: LOS-8230

LOS: LOS-8340

LOS: LOS-8270

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: N/A

Use the following information to answer the next 3 questions:

An analyst looks at shares of Staley Bear Corporation for inclusion in a high-growth equity portfolio. A key question under review is the company's sustainable growth rate of dividends. The company has consistently paid 50 to 55 percent of its earnings in dividends over the past fifteen years. It is expected to pay a dividend next year of \$0.50 on earnings per share of \$0.95.

One of the analyst's concerns is that Staley Bear's balance sheet has a great deal of debt. The debt load could limit management's ability to fund long-term growth. The company has many opportunities to expand its business into other countries. The return on equity is 17.52%, though, and has been stable for several years. The analyst believes management may lower its dividend payout ratio in the future to closer to 40% to support international expansion plans.

Along with the company information, the analyst looks at the market data and notes that the current stock price is \$15.78. The current Treasury bill rate is 2.5%; the market risk premium is 7% and the beta she applies to determine the required rate of return is 1.25. She plans to use the Gordon growth model to value Staley Bear's shares because it incorporates long-term growth rates better than the other financial models.

i.

If the current market price is the fair value for the stock, the implied growth rate of dividends is *closest to*:

☐ 7.8%.

☒ 8.1%.

☐ 14.4%.

Rationale

 **This Answer is Correct**

Using the CAPM, to find the required rate of return:

$$r_e = r_f + B(r_p) = 2.5\% + 1.25(0.07) = 11.25\%$$

If the current stock price is the fair value, then the Gordon growth model can be used to determine the implied growth rate of dividends:

$$V_0 = \frac{D_1}{r - g}$$

$$\$15.78 = \frac{0.50}{0.1125 - g}$$

$$\$15.78 (0.1125) - \$15.78g = 0.50$$

$$1.775 - 15.78g = 0.50$$

$$g = 0.0808 = 8.1\%$$

Choice A incorrectly grows D_1 by $(1 + g)$, not recognizing it was already next year's dividend.
Choice C uses ROE instead CAPM as the required rate of return in the denominator.

Rationale

✔ This Answer is Correct

Using the CAPM, to find the required rate of return:

$$r_e = r_f + B(r_p) = 2.5\% + 1.25 (0.07) = 11.25\%$$

If the current stock price is the fair value, then the Gordon growth model can be used to determine the implied growth rate of dividends:

$$V_0 = \frac{D_1}{r - g}$$

$$\$15.78 = \frac{0.50}{0.1125 - g}$$

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Choice C uses ROE instead CAPM as the required rate of return in the denominator.

Rationale

✔ This Answer is Correct

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$$r_e = r_f + B(r_p) = 2.5\% + 1.25 (0.07) = 11.25\%$$

If the current stock price is the fair value, then the Gordon growth model can be used to determine the implied growth rate of dividends:

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$$\$15.78 = \frac{0.50}{0.1125 - g}$$

$$\$15.78 (0.1125) - \$15.78g = 0.50$$

$$1.775 - 15.78g = 0.50$$

$$g = 0.0808 = 8.1\%$$

Choice A incorrectly grows D_1 by $(1 + g)$, not recognizing it was already next year's dividend.
Choice C uses ROE instead CAPM as the required rate of return in the denominator.

ii.

If the company's management changes its dividend policy in future years as the analyst expects, all else being equal, the stock price will *most likely*:

- ☒ increase.
- ☐ decrease.
- ☐ stay the same.

Rationale

✗ This Answer is Incorrect

The current earnings payout rate is $0.50/0.95 = 0.5263$. This means that $1 - 52.63\%$, or 47.37% , of earnings are retained. The analyst anticipates the payout rate may fall to 40% ; the earnings retention rate will increase to $1 - 40\%$ or 60% .

One way to find the sustainable growth rate is to use the equation $g = b(\text{ROE})$, where b is the retention rate. ROE is given as 17.52% , so the growth rate would be expected to increase from 8.30% (0.1752×0.4737) to 10.51% (0.1752×0.60).

Look at the Gordon growth model equation,

$$V_0 = \frac{D_1}{r - g}$$

If g in the denominator increases, then the term $(r - g)$ will fall, all else being equal, the price, V_0 , increases.

Rationale

✗ This Answer is Incorrect

The current earnings payout rate is $0.50/0.95 = 0.5263$. This means that 1 – 52.63%, or 47.37%, of earnings are retained. The analyst anticipates the payout rate may fall to 40%; the earnings retention rate will increase to 1 – 40% or 60%.

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Look at the Gordon growth model equation,

$$V_0 = \frac{D_1}{r - g}$$

If g in the denominator increases, then the term $(r - g)$ will fall, all else being equal, the price, V_0 , increases.

Rationale

✗ This Answer is Incorrect

The current earnings payout rate is $0.50/0.95 = 0.5263$. This means that 1 – 52.63%, or 47.37%, of earnings are retained. The analyst anticipates the payout rate may fall to 40%; the earnings retention rate will increase to 1 – 40% or 60%.

One way to find the sustainable growth rate is to use the equation $g = b(\text{ROE})$, where b is the retention rate. ROE is given as 17.52%, so the growth rate would be expected to increase from 8.30% (0.1752×0.4737) to 10.51% (0.1752×0.60).

Look at the Gordon growth model equation,

$$V_0 = \frac{D_1}{r - g}$$

If g in the denominator increases, then the term $(r - g)$ will fall, all else being equal, the price, V_0 , increases.

iii.

The analyst states she chose the Gordon growth model to value Staley Bear Corporation because it incorporates long-term growth better than other models. The other *most likely* reason she chose this model is because of Staley Bear's:

- ☐ stable ROE.
- ☐ high debt load.
- ☒ consistent dividend payout ratio.

Rationale

This Answer is Incorrect

The Gordon growth model is most appropriate for companies showing long-term steady dividend growth, where dividends have a consistent meaningful relationship to earnings and cash flow.

Rationale

This Answer is Incorrect

The Gordon growth model is most appropriate for companies showing long-term steady dividend growth, where dividends have a consistent meaningful relationship to earnings and cash flow.

Rationale

This Answer is Incorrect

The Gordon growth model is most appropriate for companies showing long-term steady dividend growth, where dividends have a consistent meaningful relationship to earnings and cash flow.

Question 29

L2R34TB-AC028-1512

LOS: LOS-8300

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

An analyst believes that Hawkeye Incorporated will have a trailing P/E of 15x and an earnings retention rate of 0.65 in eight years. The expected dividend in year eight is \$0.56. The terminal value of the stock in year 8 is *closest* to:

- ☐ \$8.40
- ☐ \$12.92
- ☒ \$24.00

Rationale

✗ **\$8.40**

In the question, you're given a P/E of 15 and a dividend payout rate of $1 - 0.65 = 0.35$. The analyst projects a dividend for year 8 of \$0.56.

Using the equation for the payout rate, dividend/earnings, $\$0.56/E = 0.35$, then the earnings for year eight must be $\$0.56/0.35 = \1.60 .

Multiply this earnings estimate, \$1.60, by 15 for a terminal value of \$24.

Choice A incorrectly multiplies the dividend in year 8, \$0.56, by the P/E multiple of 15x. Choice B incorrectly divides the dividend by the retention ratio to determine earnings for year 8; instead of determining the payout ratio.

Rationale

✗ **\$12.92**

In the question, you're given a P/E of 15 and a dividend payout rate of $1 - 0.65 = 0.35$. The analyst projects a dividend for year 8 of \$0.56.

Using the equation for the payout rate, dividend/earnings, $\$0.56/E = 0.35$, then the earnings for year eight must be $\$0.56/0.35 = \1.60 .

Multiply this earnings estimate, \$1.60, by 15 for a terminal value of \$24.

Choice A incorrectly multiplies the dividend in year 8, \$0.56, by the P/E multiple of 15x. Choice B incorrectly divides the dividend by the retention ratio to determine earnings for year 8; instead of determining the payout ratio.

Rationale

✔ **\$24.00**

In the question, you're given a P/E of 15 and a dividend payout rate of $1 - 0.65 = 0.35$. The analyst projects a dividend for year 8 of \$0.56.

Using the equation for the payout rate, dividend/earnings, $\$0.56/E = 0.35$, then the earnings for year eight must be $\$0.56/0.35 = \1.60 .

Multiply this earnings estimate, \$1.60, by 15 for a terminal value of \$24.

Choice A incorrectly multiplies the dividend in year 8, \$0.56, by the P/E multiple of 15x.

Choice B incorrectly divides the dividend by the retention ratio to determine earnings for year 8; instead of determining the payout ratio.

Question 30

L2EQ-TBB211-1412

LOS: LOS-8260

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

McClean Corp. has in issuance 8% preferred securities with \$50 par value. If investors require a return of 10% from the securities, the value of the preferred stock is closest to:

- ☒ \$40.
- ☐ \$60.
- ☐ \$80.

Rationale

This Answer is Correct

The preferred shares will pay a dividend of $0.08 \times \$50 = \4 per share on a perpetual basis. The fair value of these securities at a required return of 10% will be $\$4 / 0.1 = \40 .

Question 31

L2EQ-TB0015-1412

LOS: LOS-8200

Lesson Reference: Lesson 1: Present Value Models

Difficulty: medium

Costa Lotta, CFA, is an equity analyst looking at valuing a new technology company that is experiencing high growth rates and has significant fixed capital investment. Which of the following valuation methods is *most likely* to be appropriate for this company?

- ☐ Dividend discount model.
- ☐ Free cash flow valuation.
- ☒ Residual income valuation.

Rationale

This Answer is Correct

The new technology company is likely to be reinvesting all earnings and not paying out a dividend making the dividend discount model inappropriate. With high fixed capital investment there is also the risk that free cash flow is negative, which would rule out free cash flow valuation methods. The best candidate is likely residual income valuation since this does not require a dividend to be paid or for free cash flow of the firm to be positive.

Question 32

L2R34TB-AC017-1512

LOS: LOS-8310

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

Crimson Corporation pays a current annual dividend of \$0.48. It is expected to grow by 15% for the next three years, and then decline linearly over six (6) years from 15% to 6%. It will grow at 6% thereafter. The required rate of return is 10%. Using a three-stage DDM, the value of the stock is *closest* to:

☐ \$24.27

☒ \$19.81

☐ \$18.24

Rationale

 **\$24.27**

The first step is to find the present value of the first three years of dividends:

Year Dividend Present Value

0	\$0.48	
1	\$0.55	\$0.50
2	\$0.63	\$0.52
3	\$0.73	<u>\$0.55</u>
Total:		\$1.57

Then, use the H-model to value the remaining dividends for the second and third stages, setting the dividend for year 3 as D_0 :

$$\begin{aligned} V_3 &= \frac{D_0(1+g_L) + D_0H(g_S - g_L)}{r - g_L} \\ &= \frac{0.73(1.06) + 0.73(3)(0.15 - 0.06)}{0.10 - 0.06} \\ &= \$24.27 \end{aligned}$$

The present value of the year three value found using the H-model is:

$$\text{PV of year 3 value} = \frac{\$24.27}{(1.10)^3} = \$18.24$$

Finally, find the present value of the second and third stages and add it to the present value of the first stage:

$$\text{Total PV} = \$18.24 + \$1.57 = \$19.81$$

Choice A is the terminal value and choice C is the present value of the terminal value only, it does not include the present value of the D1 through D3.

Rationale

✔ \$19.81

The first step is to find the present value of the first three years of dividends:

Year Dividend Present Value

0	\$0.48	
1	\$0.55	\$0.50
2	\$0.63	\$0.52
3	\$0.73	<u>\$0.55</u>
Total:		\$1.57

Then, use the H-model to value the remaining dividends for the second and third stages, setting the dividend for year 3 as D_0 :

$$\begin{aligned} V_3 &= \frac{D_0(1+g_L) + D_0H(g_S - g_L)}{r - g_L} \\ &= \frac{0.73(1.06) + 0.73(3)(0.15 - 0.06)}{0.10 - 0.06} \\ &= \$24.27 \end{aligned}$$

The present value of the year three value found using the H-model is:

$$\text{PV of year 3 value} = \frac{\$24.27}{(1.10)^3} = \$18.24$$

Finally, find the present value of the second and third stages and add it to the present value of the first stage:

$$\text{Total PV} = \$18.24 + \$1.57 = \$19.81$$

Choice A is the terminal value and choice C is the present value of the terminal value only, it does not include the present value of the D_1 through D_3 .

Rationale

✘ \$18.24

The first step is to find the present value of the first three years of dividends:

Year Dividend Present Value

0	\$0.48	
1	\$0.55	\$0.50

	Year	Dividend	Present Value
	2	\$0.63	\$0.52
	3	\$0.73	<u>\$0.55</u>
	Total:		\$1.57

Then, use the H-model to value the remaining dividends for the second and third stages, setting the dividend for year 3 as D_0 :

$$\begin{aligned} V_3 &= \frac{D_0(1+g_L)+D_0H(g_S-g_L)}{r-g_L} \\ &= \frac{0.73(1.06)+0.73(3)(0.15-0.06)}{0.10-0.06} \\ &= \$24.27 \end{aligned}$$

The present value of the year three value found using the H-model is:

$$\text{PV of year 3 value} = \frac{\$24.27}{(1.10)^3} = \$18.24$$

Finally, find the present value of the second and third stages and add it to the present value of the first stage:

$$\text{Total PV} = \$18.24 + \$1.57 = \$19.81$$

Choice A is the terminal value and choice C is the present value of the terminal value only, it does not include the present value of the D_1 through D_3 .

Question 33

L2R34TB-AC020-1512

LOS: LOS-8340

Lesson Reference: Lesson 5: The Financial Determinants of Growth Rates

Difficulty: medium

Blackhawk Enterprises has the following financial information:

	2014 (\$ in millions)
Revenue	150,750
Net income	14,851
Total assets	95,860
Shareholders' equity	62,134
Earnings per share	0.99
Dividends per share	0.30

The company's sustainable growth rate is *closest* to:

- ☐ 30.3%
- ☐ 23.9%
- ☒ 16.7%

Rationale

✗ 30.3%

Using the PRAT model, the following answer is generated:

$$\begin{aligned} g &= \frac{\text{Net income} - \text{Dividends}}{\text{Net income}} \times \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Shareholders' equity}} \\ &= \frac{0.99 - 0.30}{0.99} \times \frac{14,851}{150,750} \times \frac{150,750}{95,860} \times \frac{95,860}{62,134} \\ &= 0.1666 \end{aligned}$$

30.3% is the payout ratio and 23.9% is the return on equity.

Rationale

✗ 23.9%

Using the PRAT model, the following answer is generated:

$$\begin{aligned}
 g &= \frac{\text{Net income} - \text{Dividends}}{\text{Net income}} \times \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Shareholders' equity}} \\
 &= \frac{0.99 - 0.30}{0.99} \times \frac{14,851}{150,750} \times \frac{150,750}{95,860} \times \frac{95,860}{62,134} \\
 &= 0.1666
 \end{aligned}$$

30.3% is the payout ratio and 23.9% is the return on equity.

Rationale

✔ 16.7%

Using the PRAT model, the following answer is generated:

$$\begin{aligned}
 g &= \frac{\text{Net income} - \text{Dividends}}{\text{Net income}} \times \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Shareholders' equity}} \\
 &= \frac{0.99 - 0.30}{0.99} \times \frac{14,851}{150,750} \times \frac{150,750}{95,860} \times \frac{95,860}{62,134} \\
 &= 0.1666
 \end{aligned}$$

30.3% is the payout ratio and 23.9% is the return on equity.

Question 34

L2R34TB-AC008-1512

LOS: LOS-8210

Lesson Reference: Lesson 1: Present Value Models

Difficulty: medium

Husky Industries is expected to report earnings per share of \$1.00 in one year. Earnings are expected to grow at 10% for the next three years, when the stock will be worth \$15.00. The company is committed to a 55% payout ratio. The required rate of return is 13%. The value of the company's shares today is *closest* to:

- ☐ \$10.62
- ☒ \$11.82
- ☐ \$12.98

Rationale

 **\$10.62**

With a payout rate of 55% and a 10% growth rate, dividends are $\$1.00 \times .55 = \0.55 for year 1, $\$0.55(1.10) = \0.605 for year 2, and $\$0.605(1.10) = \0.666 for year 3. Also in year 3, you receive a stock worth \$15. Using a 13% discount rate and the general DDM model, the value is determined as:

$$\begin{aligned} V_0 &= \frac{D_1}{(1+r)^1} + \dots + \frac{D_n}{(1+r)^n} + \frac{P_n}{(1+r)^n} \\ &= \frac{0.55}{(1.13)^1} + \frac{0.605}{(1.13)^2} + \frac{0.666}{(1.13)^3} + \frac{\$15}{(1.13)^3} = 11.82 \end{aligned}$$

Choice A incorrectly discounts the price of the stock at four periods not three. Choice C incorrectly discounts earnings per share instead of dividend.

Rationale

 **\$11.82**

With a payout rate of 55% and a 10% growth rate, dividends are $\$1.00 \times .55 = \0.55 for year 1, $\$0.55(1.10) = \0.605 for year 2, and $\$0.605(1.10) = \0.666 for year 3. Also in year 3, you receive a stock worth \$15. Using a 13% discount rate and the general DDM model, the value is determined as:

$$\begin{aligned} V_0 &= \frac{D_1}{(1+r)^1} + \dots + \frac{D_n}{(1+r)^n} + \frac{P_n}{(1+r)^n} \\ &= \frac{0.55}{(1.13)^1} + \frac{0.605}{(1.13)^2} + \frac{0.666}{(1.13)^3} + \frac{\$15}{(1.13)^3} = 11.82 \end{aligned}$$

Choice A incorrectly discounts the price of the stock at four periods not three. Choice C incorrectly discounts earnings per share instead of dividend.

Rationale

✖ \$12.98

With a payout rate of 55% and a 10% growth rate, dividends are $\$1.00 \times .55 = \0.55 for year 1, $\$0.55(1.10) = \0.605 for year 2, and $\$0.605(1.10) = \0.666 for year 3. Also in year 3, you receive a stock worth \$15. Using a 13% discount rate and the general DDM model, the value is determined as:

$$\begin{aligned} V_0 &= \frac{D_1}{(1+r)^1} + \dots + \frac{D_n}{(1+r)^n} + \frac{P_n}{(1+r)^n} \\ &= \frac{0.55}{(1.13)^1} + \frac{0.605}{(1.13)^2} + \frac{0.666}{(1.13)^3} + \frac{\$15}{(1.13)^3} = 11.82 \end{aligned}$$

Choice A incorrectly discounts the price of the stock at four periods not three. Choice C incorrectly discounts earnings per share instead of dividend.

Question 35

L2R34TB-AC013-1512

LOS: LOS-8340

Lesson Reference: Lesson 5: The Financial Determinants of Growth Rates

Difficulty: medium

An analyst is using the Gordon growth model to value FlameCo. The company had earnings per share of \$1.50 this year, with a retention rate of 66.67%. The expected return on equity is 15% and the required rate of return is 12%. Assume all dividends are paid at the end of the year. What is the company's sustainable growth rate?

- ☐ 5.00%
- ☐ 8.00%
- ☒ 10.00%

Rationale

✗ 5.00%

The sustainable growth rate is $g = b(\text{ROE}) = 0.15 \times 0.6667 = 10\%$. Choice A incorrectly uses the payout rate, not the retention rate, to calculate g . Choice B incorrectly uses the required rate of return, not ROE, to calculate g .

Rationale

✗ 8.00%

The sustainable growth rate is $g = b(\text{ROE}) = 0.15 \times 0.6667 = 10\%$. Choice A incorrectly uses the payout rate, not the retention rate, to calculate g . Choice B incorrectly uses the required rate of return, not ROE, to calculate g .

Rationale

✓ 10.00%

The sustainable growth rate is $g = b(\text{ROE}) = 0.15 \times 0.6667 = 10\%$. Choice A incorrectly uses the payout rate, not the retention rate, to calculate g . Choice B incorrectly uses the required rate of return, not ROE, to calculate g .

Question 36

L200-PQ0025-1412

LOS: LOS-8200

Lesson Reference: Lesson 1: Present Value Models

Difficulty: medium

When using the free cash flow model for forecasting equity values, what changes need to be made to the time horizon of the forecast if the company expects to start producing negative cash flows?

- ☐ The forecasting horizon would remain unchanged.
- ☐ The forecasting horizon would have to be extended to the point where free cash flows turn neutral.
- ☒ The forecasting horizon would have to be extended to the point where free cash flows turn positive.

Rationale

✔ **This Answer is Correct**

The forecasting horizon would have to be extended to the point where free cash flows turn positive.

Question 37

L2EQ-PQ3302-1411

LOS: LOS-8320

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

Diego Investments' stock is currently trading at \$22.45 per share. The company recently paid a dividend of \$1.80, which is expected to grow at a rate of 5.5% forever. Given that the stock is fairly valued, the required rate of return on the stock is *closest to*:

- ☐ 13.51%
- ☐ 11.39%
- ☒ 13.96%

Rationale

✔ This Answer is Correct

$$V_0 = D_1 / (r - g)$$

$$22.45 = (1.80 \times 1.055) / (r - 0.055)$$

$$r = 13.96\%$$

Question 38

L2EQ-TB0020-1412

LOS: LOS-8240

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

If a company has a return on equity equal to its required return on equity, then its present value of growth opportunities (PVGO) will be:

- ☐ Negative.
- ☒ Zero.
- ☐ Positive.

Rationale

This Answer is Correct

The PVGO will be positive when the company has a return on equity higher than that of its required return on equity and vice versa. When the return on equity is equal to the required return on equity, the PVGO will be zero.

Question 39

L2R34TB-AC014-1512

LOS: LOS-8240

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

An analyst is using the Gordon growth model to value Zipper Industries. The company had earnings per share of \$1.50 this year, with a retention rate of 66.67%. The expected return on equity is 12%, and the required rate of return is 11%. Assume all dividends are paid at the end of the year. The present value of growth opportunities (PVGO) is *closest* to:

- ☐ \$18.00
- ☐ \$13.64
- ☒ \$4.36

Rationale

 **\$18.00**

First, find the long-term growth rate, which is $g = b(\text{ROE}) = 12\% \times 0.6667 = 8.0\%$.

Next, find the dividend. If earnings per share for this year are \$1.50, then the dividend with a 66.67% retention rate is $\$1.50 \times (1 - 0.6667) = \0.50 . With a growth rate of 8%, the dividend for next year (D_1) would be $\$0.50 \times 1.08 = \0.54 .

Using the Gordon growth model, find the present value of a share:

$$V_0 = \frac{D_1}{r - g} = \frac{0.54}{0.11 - 0.08} = \$18.00$$

To find the present value of growth opportunities, subtract the no-growth value of the company from the present value with the growing dividend. With no growth, the company would pay out all its earnings, so the value would be a perpetuity:

$$V_0 = \frac{D}{r} = \frac{1.50}{0.11} = \$13.64$$

The present value of growth opportunities (PVGO) is the difference between the valuation with growth and the valuation without it:

$$\text{PVGO} = \$18.00 - \$13.64 = \$4.36$$

Rationale

 **\$13.64**

First, find the long-term growth rate, which is $g = b(\text{ROE}) = 12\% \times 0.6667 = 8.0\%$.

Next, find the dividend. If earnings per share for this year are \$1.50, then the dividend with a 66.67% retention rate is $\$1.50 \times (1 - 0.6667) = \0.50 . With a growth rate of 8%, the dividend for next year (D_1) would be $\$0.50 \times 1.08 = \0.54 .

Using the Gordon growth model, find the present value of a share:

$$V_0 = \frac{D_1}{r - g} = \frac{0.54}{0.11 - 0.08} = \$18.00$$

To find the present value of growth opportunities, subtract the no-growth value of the company from the present value with the growing dividend. With no growth, the company would pay out all its earnings, so the value would be a perpetuity:

$$V_0 = \frac{D}{r} = \frac{1.50}{0.11} = \$13.64$$

The present value of growth opportunities (PVGO) is the difference between the valuation with growth and the valuation without it:

$$\text{PVGO} = \$18.00 - \$13.64 = \$4.36$$

Rationale

✔ **\$4.36**

First, find the long-term growth rate, which is $g = b(\text{ROE}) = 12\% \times 0.6667 = 8.0\%$.

Next, find the dividend. If earnings per share for this year are \$1.50, then the dividend with a 66.67% retention rate is $\$1.50 \times (1 - 0.6667) = \0.50 . With a growth rate of 8%, the dividend for next year (D_1) would be $\$0.50 \times 1.08 = \0.54 .

Using the Gordon growth model, find the present value of a share:

$$V_0 = \frac{D_1}{r - g} = \frac{0.54}{0.11 - 0.08} = \$18.00$$

To find the present value of growth opportunities, subtract the no-growth value of the company from the present value with the growing dividend. With no growth, the company would pay out all its earnings, so the value would be a perpetuity:

$$V_0 = \frac{D}{r} = \frac{1.50}{0.11} = \$13.64$$

The present value of growth opportunities (PVGO) is the difference between the valuation with growth and the valuation without it:

$$\text{PVGO} = \$18.00 - \$13.64 = \$4.36$$

Question 40

L2EQ-PQ3319-1411

LOS: LOS-8380

LOS: LOS-8310

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

Joanna Kaprikova is evaluating the stock of Maya Company which is currently trading at \$100.76 per share. The stock recently paid a dividend of \$2.25 per share, which is expected to grow at a rate of 25% for the next 2 years, followed by a 17% growth rate for 3 years, after which it is expected to stabilize at a perpetual constant growth rate of 8%. Given a required rate of return of 12%, the stock is *most likely*:

- ☐ Undervalued
- ☒ Fairly valued
- ☐ Overvalued

Rationale

✔ This Answer is Correct

$$D_1 = 2.25 \times 1.25 = \$2.8125$$

$$D_2 = 2.25 \times 1.25^2 = \$3.5156$$

$$D_3 = 3.5156 \times 1.17 = \$4.1133$$

$$D_4 = 3.5156 \times 1.17^2 = \$4.8125$$

$$D_5 = 3.5156 \times 1.17^3 = \$5.6307$$

$$D_6 = 5.6306 \times 1.08 = 6.0810$$

$$V_5 = 6.0810 / (0.12 - 0.08) = \$152.025$$

[CF] [2nd] [CE|C]

[Enter] [↓]

2.8125 [Enter] [↓] [↓]

3.5156 [Enter] [↓] [↓]

4.1133 [Enter] [↓] [↓]

4.8125 [Enter] [↓] [↓]

157.6556 [Enter]

[NPV] 12 [Enter] [↓] [CPT]

NPV = \$100.7680

Since the stock's current price (\$100.76) is the same as its intrinsic value (\$100.76), it is fairly valued.

Question 41

L2EQ-PQ3304-1411

LOS: LOS-8220

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

Daniela wants to estimate the price of Alpha Ltd.'s stock. The company is expected to pay a dividend of \$2.50 next year, which is expected to grow at a constant rate of 4.5% forever. Given a required rate of return of 12.5%, the intrinsic value of the stock is *closest to*:

☐ \$20.25

☒ \$31.25

☐ \$32.66

Rationale

✔ **This Answer is Correct**

$$V_0 = D_1 / (r - g)$$

$$V_0 = 2.50 / (0.125 - 0.045) = \$31.25$$

Question 42

L2R34TB-AC024-1512

LOS: LOS-8230

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

Saluki Industries stock trades at \$25.57. The company will pay a dividend of \$1.20 this year, and it is expected to grow at a constant rate indefinitely. The risk-free rate of return is 3%, the market risk premium is 8%, and the company's beta is 1.05. The implied growth rate of the company's dividends is *closest* to:

- ☒ 6.41%
- ☐ 11.40%
- ☐ 15.61%

Rationale

✓ **6.41%**

Using the CAPM, the required rate of return is:

$$r_e = r_f + \beta(r_p) = 0.03 + 1.05(0.08) = 0.114$$

Next, use the Gordon growth model, to find the growth rate:

$$\begin{aligned} V_0 &= \frac{D_1}{r-g} \\ 25.57 &= \frac{1.20(1+g)}{0.114-g} \\ 25.57(0.114) - 25.57g &= 1.2 + 1.2g \\ 1.715 &= 26.77g \\ g &= 6.41 \end{aligned}$$

Choice B is the required rate of return; choice C miscalculates backing out growth rate.

Rationale

✗ **11.40%**

Using the CAPM, the required rate of return is:

$$r_e = r_f + \beta(r_p) = 0.03 + 1.05(0.08) = 0.114$$

Next, use the Gordon growth model, to find the growth rate:

$$\begin{aligned}
 V_0 &= \frac{D_1}{r-g} \\
 25.57 &= \frac{1.20(1+g)}{0.114-g} \\
 25.57(0.114) - 25.57g &= 1.2 + 1.2g \\
 1.715 &= 26.77g \\
 g &= 6.41
 \end{aligned}$$

Choice B is the required rate of return; choice C miscalculates backing out growth rate.

Rationale

✖ 15.61%

Using the CAPM, the required rate of return is:

$$r_e = r_f + \beta(r_p) = 0.03 + 1.05(0.08) = 0.114$$

Next, use the Gordon growth model, to find the growth rate:

$$\begin{aligned}
 V_0 &= \frac{D_1}{r-g} \\
 25.57 &= \frac{1.20(1+g)}{0.114-g} \\
 25.57(0.114) - 25.57g &= 1.2 + 1.2g \\
 1.715 &= 26.77g \\
 g &= 6.41
 \end{aligned}$$

Choice B is the required rate of return; choice C miscalculates backing out growth rate.

Question 43

L2EQ-ITEMSET-TBX106-1502

LOS: LOS-8310

LOS: LOS-8340

LOS: LOS-8320

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

The next three questions relate to the following information:

Charlie Onlap, CFA, is an equity analyst using the dividend discount model to value the shares of Scios Corporation. Scios has just paid a dividend of \$0.17 per share, and Onlap expects this dividend to grow at 12% for the next three years. At that time, the growth rate in dividends will begin to fall in a roughly linear fashion over the next five years to settle at a long-term growth rate of 2%. Onlap estimates a required return of 10% for the shares of Scios.

Scios is expected to have long-term stable net profit margin of 5%, total asset turnover of 0.5x, financial leverage of 1.5x, and a payout ratio of 55%.

The share price of Scios Corp is currently \$2.50.

i.

Using Onlap's assumptions, the fair value of Scios shares is *closest* to:

☐ \$3.14

☒ \$3.38

☐ \$3.79

Rationale

 **This Answer is Correct**

Given the expected linear decline in growth rates, the relevant model to use is the H-model.

The H-model should be used at the point in time where the growth rate in dividends begins to decline, namely, time 3 before being discounted back to the present. Dividends at times 1, 2, and 3 should be discounted explicitly and added to the H-model value to achieve the present fair value of the shares.

Dividend at time 0 = \$0.17

Dividend at time 1 = $\$0.17 \times 1.12 = \0.1904

Dividend at time 2 = $\$0.17 \times 1.12^2 = \0.2132

Dividend at time 3 = $\$0.17 \times 1.12^3 = \0.2388

Using the H-model at time 3 gives the present value at time 3 of dividends that occur after time 3 as:

$$V_3 = \frac{D_3(1+g)}{(r-g)} + \frac{D_3H(G-g)}{(r-g)}$$

Where: g = low long-term growth rate

r = required return

G = high initial growth rate

H = half the period taken to transition from the high growth rate to the low growth rate.

Hence, in this case:

$$V_3 = \frac{\$0.2388(1.02)}{(0.1-0.02)} + \frac{\$0.2388 \times 2.5 \times (0.12-0.02)}{(0.1-0.02)} = \$3.0447 + \$0.74625 \\ = \$3.791$$

Then the present value of the shares is given by:

$$\$0.1904/(1.1) + \$0.2131/(1.1)^2 + (\$0.2388 + \$3.791)/(1.1)^3 = \$3.377$$

ii.

According to the fundamental drivers of growth for Scios Corp., the sustainable long-term growth rate is *closest* to:

- ☒ 1.7%.
- ☐ 2.1%.
- ☐ 3.8%.

Rationale

This Answer is Correct

The sustainable long-term growth rate is equal to the return on equity multiplied by the retention rate of the company.

Using the Dupont expansion, the return on equity of Scios is expected to be net margin \times total asset turnover \times financial leverage multiplier, which in this case is:

Return on equity = $0.05 \times 0.5 \times 1.5 = 0.0375$ or 3.75%

The retention rate = $1 - \text{payout rate} = 1 - 0.55 = 0.45$

Hence, the sustainable growth rate is $3.75\% \times 0.45 = 1.69\%$

iii.

Under the single-stage dividend discount model with an assumed long-term growth rate of 2%, which of the following is *closest* to the implied market required rate of return for Scios Corp.?

- ☒ 9%.

- ☐ 10%.
- ☐ 12%.

Rationale

✔ **This Answer is Correct**

The implied market required rate of return can be found by solving for the required return that values Scios shares at their current market price using the single-stage dividend discount model.

In this case, $\$2.50 = (\$0.17 \times 1.02) / (r - 0.02)$.

Hence, $r = 0.0893$ or 8.9%.

Question 44

L2EQ-TBB212-1412

LOS: LOS-8270

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

The Gordon growth model is *most likely* to be appropriate when valuing:

- ☐ The equity of new start-up companies.
- ☒ The value of a developed market index.
- ☐ The equity of a company with an unstable capital structure.

Rationale

This Answer is Correct

The Gordon growth model is appropriate for valuing the equity of dividend-paying companies when its key assumptions of a stable future dividend and earnings growth rate is expected to be satisfied. It is unlikely that the new start-up company will pay any dividends in the early stages of the company's life. It is also not appropriate for a company that changes its capital structure, since the model assumes the company does not raise any external equity finance. Broad equity market indices of developed markets tend to satisfy the conditions of the model fairly well.

Question 45

L2R34TB-AC025-1512

LOS: LOS-8230

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

Badger Business Machines stock trades at \$18.82. The analyst covering this company believes the current price is fairly value based on his analysis. He estimates the company will pay a dividend of \$0.60 next year, and it is expected to grow at a constant rate indefinitely. The risk-free rate of return is 3%, the market risk premium is 8%, and the company's beta is 0.85. The expected capital gains yield is *closest to*:

- ☐ 6.4%
- ☒ 6.6%
- ☐ 9.8%

Rationale

 6.4%

Using the CAPM, the required rate of return is:

$$r_e = r_f + \beta(r_p) = 0.03 + 0.85(0.08) = 0.098$$

Because the analyst believes the stock is fairly valued in the market, the capital gains yield should be the same as the expected dividend growth rate. The g rate is found using the Gordon growth model:

$$\begin{aligned} V_0 &= \frac{D_1}{r-g} \\ \$18.82 &= \frac{\$0.60}{0.098-g} \\ \$18.82(0.098) - \$18.82g &= \$0.60 \\ g &= 0.0661 = 6.61\% \end{aligned}$$

Choice A grows the dividend by one year; this is not necessary, this dividend is D_1 . Choice C is the required rate of return.

Rationale

 6.6%

Using the CAPM, the required rate of return is:

$$r_e = r_f + \beta(r_p) = 0.03 + 0.85(0.08) = 0.098$$

Because the analyst believes the stock is fairly valued in the market, the capital gains yield should be the same as the expected dividend growth rate. The g rate is found using the Gordon growth model:

$$\begin{aligned} V_0 &= \frac{D_1}{r-g} \\ \$18.82 &= \frac{\$0.60}{0.098-g} \\ \$18.82(0.098) - \$18.82g &= \$0.60 \\ g &= 0.0661 = 6.61\% \end{aligned}$$

Choice A grows the dividend by one year; this is not necessary, this dividend is D_1 . Choice C is the required rate of return.

Rationale

 **9.8%**

Using the CAPM, the required rate of return is:

$$r_e = r_f + \beta(r_p) = 0.03 + 0.85(0.08) = 0.098$$

Because the analyst believes the stock is fairly valued in the market, the capital gains yield should be the same as the expected dividend growth rate. The g rate is found using the Gordon growth model:

$$\begin{aligned} V_0 &= \frac{D_1}{r-g} \\ \$18.82 &= \frac{\$0.60}{0.098-g} \\ \$18.82(0.098) - \$18.82g &= \$0.60 \\ g &= 0.0661 = 6.61\% \end{aligned}$$

Choice A grows the dividend by one year; this is not necessary, this dividend is D_1 . Choice C is the required rate of return.

Question 46

L2R34TB-AC016-1512

LOS: LOS-8350

Lesson Reference: Lesson 5: The Financial Determinants of Growth Rates

Difficulty: medium

Rambler Resources will pay a dividend of \$0.60 this year. It is expected to pay \$0.70 next year, \$0.80 in two years, and \$0.92 in three years for a compound annual growth rate (CAGR) of 15%. An analyst estimates the value of this stock using a three-stage DDM. He assumes the following: the growth rate will decline linearly to 8% over 7 years; the required rate of return is 12% and a fair value range is 10%. The current stock price is \$22.00. Based on this information, the analyst concludes Rambler Resources is *most likely*:

- ☐ undervalued.
- ☒ fairly valued.
- ☐ overvalued.

Rationale

 **undervalued.**

The first step is to find the present value of the first three years of dividends:

Year Dividend Present Value

0	\$0.60	
1	\$0.70	\$0.63
2	\$0.80	\$0.64
3	\$0.92	<u>\$0.65</u>
Total:		\$1.92

Then, use the H-model to value the remaining dividends for the second and third stages, setting the dividend for year 3 as D_0 :

$$\begin{aligned} V_3 &= \frac{D_0(1+g_L) + D_0H(g_S - g_L)}{r - g_L} \\ &= \frac{0.92(1.08) + 0.92(3.5)(0.15 - 0.08)}{0.12 - 0.08} \\ &= \frac{0.9936 + 0.2254}{0.04} \\ &= \$30.48 \end{aligned}$$

The present value of the year three value found using the H-model is:

$$\text{PV of year 3 value} = \frac{\$30.48}{(1.12)^3} = \$21.69$$

Finally, find the present value of the second and third stages and add it to the present value of the first stage:

$$\text{Total PV} = \$21.69 + \$1.92 = \$23.61$$

If the fair-value range is 10%, then the value can be between \$21.25 ($\23.61×0.90) and \$25.97 ($\23.61×1.10) to be considered to be fairly valued.

Rationale

✔ fairly valued.

The first step is to find the present value of the first three years of dividends:

Year Dividend Present Value

0	\$0.60	
1	\$0.70	\$0.63
2	\$0.80	\$0.64
3	\$0.92	<u>\$0.65</u>
Total:		\$1.92

Then, use the H-model to value the remaining dividends for the second and third stages, setting the dividend for year 3 as D_0 :

$$\begin{aligned}
 V_3 &= \frac{D_0(1+g_L)+D_0H(g_S-g_L)}{r-g_L} \\
 &= \frac{0.92(1.08)+0.92(3.5)(0.15-0.08)}{0.12-0.08} \\
 &= \frac{0.9936+0.2254}{0.04} \\
 &= \$30.48
 \end{aligned}$$

The present value of the year three value found using the H-model is:

$$\text{PV of year 3 value} = \frac{\$30.48}{(1.12)^3} = \$21.69$$

Finally, find the present value of the second and third stages and add it to the present value of the first stage:

$$\text{Total PV} = \$21.69 + \$1.92 = \$23.61$$

If the fair-value range is 10%, then the value can be between \$21.25 ($\23.61×0.90) and \$25.97 ($\23.61×1.10) to be considered to be fairly valued.

Rationale

✗ overvalued.

The first step is to find the present value of the first three years of dividends:

Year Dividend Present Value

0	\$0.60	
1	\$0.70	\$0.63
2	\$0.80	\$0.64
3	\$0.92	<u>\$0.65</u>
Total:	\$1.92	

Then, use the H-model to value the remaining dividends for the second and third stages, setting the dividend for year 3 as D_0 :

$$\begin{aligned}
 V_3 &= \frac{D_0(1+g_L)+D_0H(g_S-g_L)}{r-g_L} \\
 &= \frac{0.92(1.08)+0.92(3.5)(0.15-0.08)}{0.12-0.08} \\
 &= \frac{0.9936+0.2254}{0.04} \\
 &= \$30.48
 \end{aligned}$$

The present value of the year three value found using the H-model is:

$$\text{PV of year 3 value} = \frac{\$30.48}{(1.12)^3} = \$21.69$$

Finally, find the present value of the second and third stages and add it to the present value of the first stage:

$$\text{Total PV} = \$21.69 + \$1.92 = \$23.61$$

If the fair-value range is 10%, then the value can be between \$21.25 ($\23.61×0.90) and \$25.97 ($\23.61×1.10) to be considered to be fairly valued.

Question 47

L2EQ-TB0016-1412

LOS: LOS-8210

Lesson Reference: Lesson 2: The Dividend Discount Model

Difficulty: medium

For the next four years, annual dividends of a stock are expected to be 5p, 5p, 6p, and 7p. After four years, the cum-dividend price of the stock is expected to be 110p. If the required return on equity is 8%, the value of the stock today is closest to:

- ☒ 94.5p.
- ☐ 99.7p.
- ☐ 110.0p.

Rationale

This Answer is Correct

The price of 110p in four years time is a cum-dividend price, that is, it already includes the dividend payable at the end of the fourth year of 7p. Hence, the present value of the cash flows expected from the stock is: $V_0 = 5/(1.08) + 5/(1.08)^2 + 6/(1.08)^3 + 110/(1.08)^4 = 94.5p$

Question 48

L2R34TB-AC018-1512

LOS: LOS-8320

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

Bobcat Software has a dividend yield of 5% and a current growth rate of 12% per year. Growth is expected to decline linearly for 8 years until the company hits its mature growth rate of 4% per year. Using the H-model, the required rate of return is *closest* to:

- ☐ 12.4%
- ☒ 10.8%
- ☐ 6.80%

Rationale

 **12.4%**

The H-model can be rearranged to solve for r :

$$\begin{aligned}V_0 &= \frac{D_0(1+g_L)+D_0H(g_S-g_L)}{r-g_L} \\r &= \frac{D_0}{P_0}[(1+g_L) + H(g_S - g_L)] + g_L \\r &= 0.05 \left[(1 + 0.04) + \frac{8}{2}(0.12 - 0.04) \right] + 0.04 = 0.1080\end{aligned}$$

Choice A incorrectly uses 8 instead of 4 as H in the formula. Choice C omits the final factor of 4% mature growth rate.

Rationale

 **10.8%**

The H-model can be rearranged to solve for r :

$$\begin{aligned}V_0 &= \frac{D_0(1+g_L)+D_0H(g_S-g_L)}{r-g_L} \\r &= \frac{D_0}{P_0}[(1+g_L) + H(g_S - g_L)] + g_L \\r &= 0.05 \left[(1 + 0.04) + \frac{8}{2}(0.12 - 0.04) \right] + 0.04 = 0.1080\end{aligned}$$

Choice A incorrectly uses 8 instead of 4 as H in the formula. Choice C omits the final factor of 4% mature growth rate.

Rationale

✖ 6.80%

The H-model can be rearranged to solve for r :

$$V_0 = \frac{D_0(1+g_L) + D_0H(g_S - g_L)}{r - g_L}$$

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

$$r = 0.05 \left[(1 + 0.04) + \frac{8}{2}(0.12 - 0.04) \right] + 0.04 = 0.1080$$

Choice A incorrectly uses 8 instead of 4 as H in the formula. Choice C omits the final factor of 4% mature growth rate.

Question 49

L2R34TB-AC026-1512

LOS: LOS-8310

Lesson Reference: Lesson 4: Multistage Dividend Discount Models, and Terminal Value

Difficulty: medium

Iguana Incorporated will pay a dividend of \$0.48 this year. The dividend is then expected to grow by 14% a year for 3 years; it will be 6% per year after that. The required rate of return is 10%. The value of a share of Iguana Incorporated's stock is *closest* to:

- ☒ \$15.71
- ☐ \$14.42
- ☐ \$14.16

Rationale

✓ **\$15.71**

Using the equation for the two-stage DDM, the value is:

$$\begin{aligned} V_0 &= \sum_{t=1}^n \frac{D_0(1+g_s)^t}{(1+r)^t} + \frac{D_0(1+g_s)^n(1+g_L)}{(1+r)^n(r-g_L)} \\ &= \frac{0.5472}{1.10} + \frac{0.6238}{1.21} + \frac{0.7111}{1.33} + \frac{0.48(1.14)^3(1.06)}{(1+0.10)^3(0.10-0.06)} \\ &= \$15.71 \end{aligned}$$

Choice B incorrectly discounts the terminal value by four periods, not three. Choice C is the present value of the terminal value; it excludes the present value of the early dividends.

Rationale

✗ **\$14.42**

Using the equation for the two-stage DDM, the value is:

$$\begin{aligned} V_0 &= \sum_{t=1}^n \frac{D_0(1+g_s)^t}{(1+r)^t} + \frac{D_0(1+g_s)^n(1+g_L)}{(1+r)^n(r-g_L)} \\ &= \frac{0.5472}{1.10} + \frac{0.6238}{1.21} + \frac{0.7111}{1.33} + \frac{0.48(1.14)^3(1.06)}{(1+0.10)^3(0.10-0.06)} \\ &= \$15.71 \end{aligned}$$

Choice B incorrectly discounts the terminal value by four periods, not three. Choice C is the present value of the terminal value; it excludes the present value of the early dividends.

Rationale

✖ \$14.16

Using the equation for the two-stage DDM, the value is:

$$\begin{aligned}V_0 &= \sum_{t=1}^n \frac{D_0(1+g_s)^t}{(1+r)^t} + \frac{D_0(1+g_s)^n(1+g_L)}{(1+r)^n(r-g_L)} \\&= \frac{0.5472}{1.10} + \frac{0.6238}{1.21} + \frac{0.7111}{1.33} + \frac{0.48(1.14)^3(1.06)}{(1+0.10)^3(0.10-0.06)} \\&= \$15.71\end{aligned}$$

Choice B incorrectly discounts the terminal value by four periods, not three. Choice C is the present value of the terminal value; it excludes the present value of the early dividends.

Question 50

L2EQ-TBB210-1412

LOS: LOS-8250

Lesson Reference: Lesson 3: The Gordon Growth Model, Present Value of Growth Opportunities (PVGO), and P/E Ratios

Difficulty: medium

An analyst collects the following data for a UK company:

Current stock price	340p
Trailing EPS	27.2p
Most recent dividend declared	9.0p
Dividend growth rate	3.5%
Required return on equity	6.0%

Which of the following statements is most accurate?

- ☐ The justified trailing PE is 13.2x and the stock is undervalued.
- ☒ The justified trailing PE is 13.7x and the stock is undervalued.
- ☐ The justified trailing PE is 13.7x and the stock is overvalued.

Rationale

 **This Answer is Correct**

The justified trailing PE based on the Gordon growth model is:

$$\text{Justified trailing PE} = [\text{payout ratio} \times (1 + g)] / [r - g]$$

Where g is the growth rate in dividend and r is the required return on equity. Hence, in this case:

$$\text{Justified trailing PE} = [(9 / 27.2) \times (1.035)] / [0.06 - 0.035] = 13.7x$$

$$\text{The actual trailing PE of the stock is } 340 / 27.2 = 12.5x$$

Hence, the fair PE of the stock is higher than the actual PE, therefore, the stock is undervalued.