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1. Company TYK forecasts that it will begin paying dividends seven years from now, at which point dividends are \$1 per share. Thereafter, dividends are expected to grow at a constant rate of 6% per year. The discount rate for TYK is 10%. How much would you pay for one share in Company TYK?

1 / 1 point

**Make sure to input all currency answers without any currency symbols or commas, and use two decimal places of precision.*

12.83

 **Correct**

We must determine the value of all the future dividends at $t = 7$ and then bring it back to the present $t = 0$ using the discount rate of 10% and the constant growth rate of dividends of 6%.

$$\begin{aligned} PV_{t=7} &= \frac{D}{r-g} \\ &= \frac{1}{0.1-0.06} \\ &= \$25 \end{aligned}$$

Now let us discount this value back to $t = 0$ using the 10% discount rate.

$$\begin{aligned} PV &= \frac{25}{(1+0.1)^7} \\ &= \$12.83 \end{aligned}$$

Thus, we are willing to pay \$12.83 for one share of Company TYK today.

2. Golf Ball Inc. expects earnings to be \$10,000 per year in perpetuity if it pays out all of its earnings in dividends. Suppose the firm has an opportunity to invest \$1,000 of next year's earnings to upgrade its machinery. It is expected that this upgrade will increase earnings in all future years (starting two years from now) by \$140. Assume that Golf Ball's next dividend is one year from now. The required rate of return is 12%.

1 / 1 point

What is the value of Golf Ball Inc. if it does not undertake the upgrade?

**Make sure to input all currency answers without any currency symbols or commas, and use two decimal places of precision.*

83333.33

 **Correct**

We use the formula for a perpetuity:

$$P_0 = \frac{10000}{.12} = \$83333.33$$

3. Golf Ball Inc. expects earnings to be \$10,000 per year in perpetuity if it pays out all of its earnings in dividends. Suppose the firm has an opportunity to invest \$1,000 of next year's earnings to upgrade its machinery. It is expected that this upgrade will increase earnings in all future years (starting two years from now) by \$140. Assume that Golf Ball's next dividend is one year from now. The required rate of return is 12%.

1 / 1 point

What is the value of Golf Ball Inc. if it undertakes the upgrade?

**Make sure to input all currency answers without any currency symbols or commas, and use two decimal places of precision.*

83482.14

 **Correct**

We first calculate the NPV of the upgrade as of next year:

$$NPV = -1000 + \frac{140}{.12} = \$166.67$$

Because the NPV is positive, Golf Ball should upgrade the equipment. To calculate the impact on the price, we discount back to this year:

$$NPVGO = \frac{166.67}{1.12} = \$148.81$$

Therefore, the value today if Golf Ball undertakes the upgrade is

$$P_0 = 83333.33 + 148.81 = \$83482.14$$

4. Suppose that the consensus forecast of security analysts of your favorite company is that earnings next year will be \$5.00 per share. The company plows back 50% of its earnings and if the Chief Financial Officer (CFO) estimates that the company's return on equity (ROE) is 16%. Assuming the plowback ratio and the ROE are expected to remain constant forever:

0 / 1 point

If you believe that the company's required rate of return is 10%, what is your estimate of the price of the company's stock?

**Make sure to input all currency answers without any currency symbols or commas, and use two decimal places of precision.*

250.00

✗ Incorrect

5. Suppose that the consensus forecast of security analysts of your favorite company is that earnings next year will be \$5.00 per share. The company plows back 50% of its earnings and if the Chief Financial Officer (CFO) estimates that the company's return on equity (ROE) is 16%. Assuming the plowback ratio and the ROE are expected to remain constant forever:

1 / 1 point

Suppose you observe that the stock is selling for \$50.00 per share, what would you conclude about either your belief of the stock's required rate of return or the CFO's estimate of the company's return on equity? (select all that apply)

- ☐ the ROE on funds plowed back is more than originally estimated
☒ the ROE on funds plowed back is less than originally estimated

✓ Correct

- ☐ the required rate of return is lower than originally expected
☒ the required rate of return is higher than originally expected

✓ Correct

6. Suppose that the consensus forecast of security analysts of your favorite company is that earnings next year will be \$5.00 per share. The company plows back 50% of its earnings and if the Chief Financial Officer (CFO) estimates that the company's return on equity (ROE) is 16%. Assuming the plowback ratio and the ROE are expected to remain constant forever:

0 / 1 point

Suppose that you are confident that 10% is the required rate of return on the stock. What does the market price of \$50.00 per share imply about the market's estimate of the company's expected return on equity? (please give a number)

**Make sure to input all percentage answers as numeric values without symbols, and use four decimal places of precision. For example, if the answer is 6%, then enter 0.0600.*

0.0000

✗ Incorrect

7. Dividends on CCN corporation are expected to grow at a 9% per year. Assume that the discount rate on CCN is 12% and that the expected dividend per share in one year is \$0.50. CCN has just paid a dividend, so the next dividend is the \$0.50 to be paid one year from now.

0 / 1 point

Calculate today's price per share for CCN.

**Make sure to input all currency answers without any currency symbols or commas, and use two decimal places of precision.*

16.67

✗ Incorrect

8. Dividends on CCN corporation are expected to grow at a 9% per year. Assume that the discount rate on CCN is 12%

1 / 1 point

and that the expected dividend per share in one year is \$0.50. CCN has just paid a dividend, so the next dividend is the \$0.50 to be paid one year from now.

Calculate the expected price per share 14 years from now. Assume that a dividend has just been paid.

**Make sure to input all currency answers without any currency symbols or commas, and use two decimal places of precision.*

55.70

✓ **Correct**

The dividend 15 years from today is

$$D_{15} = D_1(1 + g)^{14} = 0.5(1.09)^{14} = \$1.67$$

So the expected price 14 years from today is

$$P_{14} = \frac{D_{15}}{0.12 - 0.09} = \$55.70$$

9. Dividends on CCN corporation are expected to grow at a 9% per year. Assume that the discount rate on CCN is 12% and that the expected dividend per share in one year is \$0.50. CCN has just paid a dividend, so the next dividend is the \$0.50 to be paid one year from now.

1 / 1 point

Assume that CCN's return on equity (ROE) is 12%. What fraction of earnings must CCN be plowing back into the company?

**Make sure to input all fraction answers as such: (numerator)/(denominator)*

$$\frac{1}{2} = 1/2$$

$\frac{3}{4}$

3/4

✓ **Correct**

$$g = ROE \cdot b \Rightarrow b = \frac{g}{ROE} = \frac{0.09}{0.12} = \frac{3}{4}$$

10. Dividends on CCN corporation are expected to grow at a 9% per year. Assume that the discount rate on CCN is 12% and that the expected dividend per share in one year is \$0.50. CCN has just paid a dividend, so the next dividend is the \$0.50 to be paid one year from now.

1 / 1 point

Can CCN alter its price by altering the plowback ratio in the previous question?

☐ Yes

☒ No

✓ **Correct**

Because ROE = discount rate, altering b has no effect on the price. This is because the increase in growth from an increase in b will be exactly offset by the decrease in dividends.