

## BA870

### SAMPLE TEST QUESTIONS and SAMPLE SOLUTIONS

These are examples of the types of *Financial & Accounting Analytics* questions that can appear on a BA870 in-class test

#### **Sample Question 1:**

Financial statement information and additional data for Wilson Enterprises is presented below.

##### **Wilson Enterprises Balance Sheet and Income Statement Data**

	December 31, 2016	December 31, 2015
Current Assets:		
Cash	\$122,000	\$113,000
Accts Receivable (net allowance of \$5K & \$4K in 2016 & 2015)	52,000	50,000
Inventories	<u>54,000</u>	<u>38,000</u>
Total Current Assets	228,000	201,000
Property, Plant, and Equipment (Gross)	37,000	22,000
Less: Accumulated Depreciation	<u>(17,000)</u>	<u>(11,000)</u>
Total Assets	<u>\$248,000</u>	<u>\$212,000</u>
Current Liabilities:		
Accounts Payable	<u>20,000</u>	<u>15,000</u>
Total Current Liabilities	20,000	15,000
Bonds Payable	<u>100,000</u>	<u>100,000</u>
Total Liabilities	<u>120,000</u>	<u>115,000</u>
Stockholders' Equity:		
Common Stock	100,000	80,000
Retained Earnings	<u>28,000</u>	<u>17,000</u>
Total Stockholders' Equity	<u>128,000</u>	<u>97,000</u>
Total Liabilities & Stockholders' Equity	<u>\$248,000</u>	<u>\$212,000</u>

##### **Additional Information:**

Net earnings of \$34,000 was reported in 2016. All declared dividends were paid in 2016. New equipment was purchased and none was sold.

See **QUESTIONS** on below related to this financial information:

- **Calculate the Current Ratio for Wilson Enterprises on December 31, 2016:**

Current Ratio = Current Assets/Current Liabilities = \$228K/\$20K = 11.4 times

- **Calculate the Quick Ratio for Wilson Enterprises on December 31, 2016:**

Quick Ratio = (Current Assets – Inventories)/Current Liabilities = (\$228K-\$54K)/\$20K= 8.7 times

[ Note that the above formula is the most common definition of the Quick Ratio (also known as the Acid Test ratio. However, you may also sometimes see the Quick Ratio defined as:

Quick Ratio = (Current Assets + Marketable Securities + Accounts Receivable)/Current Liabilities. OR  
Quick Ratio = Current Assets – Inventories – Prepaid Expenses)/Current Liabilities (see Merrell Lynch doc)

In most cases, these different definitions will give the same answer if a company does not have prepaid expenses or other less common forms of current assets.

- **What is the Net PPE on December 31, 2016?**

Net PPE = Gross PPE – Accumulated Depreciation = \$37K - \$17K = \$20,000

- **What is the Gross Accounts Receivable on December 31, 2015?**

Net A/R = Gross A/R – Allowance for Doubtful Accounts

So, Gross A/R in 2015 = Net A/R + Allowance for Doubtful Accounts = \$50K + \$4K = \$54,000

**Example Question 2:** What are the 3 keys reasons discussed in class “why a dollar received today is worth more than a dollar promised at some time in the future.” (Answer only in the box space provided).

- |  |
|--|
| 1. Opportunity Cost – Dollar received <u>today</u> can be used for some purpose and it is still available at the future date |
| 2. Inflation – Dollar in future cannot purchase same things as today.  |
| 3. Risk/uncertainty – Question of whether you will receive \$1 in future   |

**Example Question 3:**

One year from today you will deposit \$10,000 in a bank account that will accumulate compound interest of 5% per year. What will it be worth 5 years after you make the deposit (ie, 6 years from today).

**Method 1: Calculator**

PV=10K, PMT=0, N=5, I=5% → So, FV=\$12,763

**Method 2:**

FV = 10,000\*(1.05)<sup>5</sup> = \$12,763

**Example Question 4:**

What is the P/E ratio of a company with projected earnings of \$100 next year and then earnings are expected to grow at 4% per year thereafter. The company’s discount rate is 10% for future earnings?

Perpetuity: $P = CF / (r - g) \rightarrow P / CF = 1 / (r - g)$ and note that Earnings = $E \approx CF$ So, $P/E = 1 / (r - g) = 1 / (0.10 - 0.04) = 16.67$
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**Example Question 5:**

**Define** the financial accounting term: “Days inventory”. Based on our class discussions, **explain** why a company like Walmart is expected to have either higher/lower/same “Days Inventory” as a company like Tiffany.

$Days\ inventory = 365\ Days / Inventory\ Turnover = 365\ Days / [COGS / Avg\ Inventory]$   
 $= Average\ time\ it\ takes\ the\ firm\ to\ sell\ its\ through\ inventory\ in\ days$

Walmart is a high volume and low margin retailer than sells seasonal items (Therefore, expect to have lower days inventory – Actual number is around 45 days)

Tiffany is a low volume and high margin retailer that has longer days inventory (Therefore, expect to have higher days inventory – Actual number is around 490 days)

**Example Question 6:**

The cost of equity capital ( $r_e$ ) of a firm with current stock price (P) and 1-year ahead earnings (E) that are expected to grow at a constant annual rate (g) is well approximated by: (Circle only **ONE** answer):

- (a) The firm’s weighted average cost of capital (WACC) minus the growth rate (g).
- (b) The current yield on long-term bonds.
- (c) ROA of the company.
- (d)  $r_e = E / (P - g)$

(e) $r_e = (E/P) + g$
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(f) Not enough information is given in the question.

(g) None of the above.

Solution derivation for Q6: Use the fact that:  $P = E / (r - g)$

### Example Question 7:

What is the maximum you would pay today (Oct.1, 2014) for an investment that has the following future free cash inflows:

*October 1, 2014: \$0*

*October 1, 2015: \$0*

*October 1, 2016: \$1,000,000*

*October 1, 2017: \$1,000,000*

*October 1, 2018: \$1,000,000*

*October 1, 2019: \$8,000,000*

The discount rate for these cash flows is 5%. **Show your work.**

Solution: Just calculate the present value of future cash flows.

$$PV = \$1M/(1+0.05)^2 + \$1M/(1+0.05)^3 + \$1M/(1+0.05)^4 + \$8M/(1+0.05)^5$$

Compute and present your number

### Example Question 8:

Profitability analysis of a firm has the following features (**Circle ALL that are valid**):

- a. Shows there is a trade-off of between margins and turnover.
- b. Helps to give insights into a firm's strategy (luxury vs discount vs high volume).
- c. Only works for publicly-traded firms in the same industry.
- d. Reflects various economic, regulatory and competitive forces facing a firm.
- e. All of the above.

### Example Question 9:

During this course, you have learned how to use Markdown to document your Colab Notebooks for the Assignments and the Group Project. On the next page are formatted items (A)-(F) from a formatted text box in a Colab Notebook.

**REQUIRED:** In the box below, enter the complete Markdown code to reproduce the Markdown items (A)-(F) above.

(A)

(B)

(C)

(D)

(E)

(F)

## ▼ (A) Section Heading

### (B) Subsection Heading

(C) **Bold Text** and *Italic Text* on the same line

(D) An ordered list:

1. Item One
2. Item Two

(E) An unordered list:

- Bullet 1
- Bullet 2

(F) An equation:

$$y = x + z$$

#### Example Question 10:

In an important 2011 research paper, Loughran & McDonald documented how sentiment analysis using a more generic lexicon, developed for human psychology/sociology, could easily misclassify financial documents. They wrote, “In the case of finance and accounting, it is best to avoid use of word classifications schemes that come from outside the business domain.”

QUESTION: Given the recent advances in NLP, is Loughran and McDonald's recommendation still applicable today for financial documents? Discuss 2 examples where their recommendation would still apply and 2 examples where it would no longer apply.

#### Example Question 11:

You are given time-series data for the monthly stock returns (**Ret**) of a company and matching time-series data for two explanatory variables **F1** and **F2**. The descriptive statistics for the variables are as follows:

**Ret:** Mean = 1.5%, Stddev = 3%

**F1:** 25th percentile value = 0.6; 75th percentile value = 1.8

**F2:** 25th percentile value = 0.02; 75th percentile value = 0.06

You then estimate an OLS regression for the following predictive model of stock returns (**Ret**) based on 2 explanatory variables (**F1** and **F2**):

(Regression 1):  $\text{Ret} = a + b_1 \cdot F_1 + b_2 \cdot F_2 + e$

The summary statistics for estimated Regression 1 are as follows:

- Adjusted  $R^2 = 28\%$
- Estimate for  $b_1 = 0.29$  with t-stat = 3.7
- Estimate for  $b_2 = 1.47$  with t-stat = 2.1

You also estimated the following two nested regressions using the same data:

(Regression 2):  $\text{Ret} = a + b_1 \cdot F_1 + e$  and find Adj  $R^2 = 14\%$ , Estimate for  $b_1 = 0.33$  with t-stat = 3.9

(Regression 3):  $\text{Ret} = a + b_2 \cdot F_2 + e$  and find Adj  $R^2 = 19\%$ , Estimate for  $b_2 = 1.09$  with t-stat = 2.4

NOTE: All time subscripts are not listed in equations above for simplicity.

**QUESTION:** Using the information listed above, explain whether  $F_1$  or  $F_2$  is more important in explaining the stock returns ( $\text{Ret}$ ) of the company. You should consider various features including statistical, economic and overall explanatory attributes.

**Example Question 12:**

Which of the following innovations are combined together in the BERT model that allow it to achieve "state of the art" performance for NLP and Textual Analysis tasks?

- ☒ A. Bi-directional training of word associations (both left-to-right and right-to-left).
- ☒ B. Two semi-supervised training tasks based on massive generic datasets: (1) predicting words that have been masked, and (2) predicting sentence associations.
- ☒ C. The use of Transformers developed by researchers in other recent deep learning NLP algorithms (such as ELMo and ULM-Fit).
- ☒ D. The use of contextualized sentence embeddings.

Answer Key: A,B,C,D