# NANYANG TECHNOLOGICAL UNIVERSITY

## SEMESTER 2 EXAMINATION 2015-2016

## BU8201 – Business Finance

April 2016

Time Allowed: 2 hours

INSTRUCTIONS

1 This paper contains **TWO(2)** questions and comprises **NINE(9)** pages and **ONE(1)** appendix of **TWO(2)** pages.

2 Answer **ALL** questions.

3 The number of marks allocated is shown at the end of each question.

4 For Question 1, shade your answers to the multiple-choice questions on the Scantron sheet. Use only 2B pencils and erasers. Complete the front page of the Scantron sheet as follows:

(a) Write your "Subject Title" as "Business Finance".
(b) Write your "Subject Code" as "BU8201".
(c) Write your Seat Number clearly.
(d) Write the date of the examination clearly.
(e) Write and **shade** your **MATRICULATION NUMBER** in the box provided for matriculation number. Read the examples shown and ask for clarification if you have any doubt.

5 Write your answer to the question in Section B on the answer book.

6 Answers will be graded for content and appropriate presentation, and compliance with instructions.

7 The Scantron sheet and the answer script must be handed in before students leave the examination hall.

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SECTION A

Question 1

This question consists of **TWENTY(20)** multiple-choice questions. Choose the correct answer from the alternatives given. In your **SCANTRON SHEET**, shade the most correct answer (A), (B), (C), (D) or (E) next to the question number. Each multiple-choice question carries **FOUR(4)** marks.

(1) Which of the following statements is most CORRECT?

(A) Prices in the futures market are not determined immediately but at the time of future delivery of the goods transacted.

(B) A derivative security is an example of a financial asset.

(C) A long-term bond is an example of a capital market instrument but a common stock is not a capital market instrument.

(D) A Treasury bill is **not** an example of a money market instrument.

(E) When a person sells shares in SPH, he participates in a primary market transaction as the change in ownership must be recorded by SPH, the issuer of the shares.

(2) Bond XYZ is a 7-year, $1,000 par value bond with a 9% semiannual coupon. The bond, which may be called after two years at a price of $1050, has a nominal yield to call of 6.0%. What is the current price of this bond (rounded to the nearest $1)?

(A) $1,208

(B) $1,127

(C) $1,100

(D) $1,082

(E) $1,054

(3) Which of the following statements is most CORRECT?

(A) Shareholders typically dislike riskier projects more than bondholders, even though these projects offer higher expected returns.

(B) Making it more difficult for outside investors to acquire sufficient shares to control the company will reduce the conflict between managers and shareholders.

(C) Investing in riskier projects will increase the conflict between managers and shareholders.

(D) Paying managers based on stock price's performance over the longer-term will reduce the conflict between managers and bondholders.

(E) Threat of firing of managers by current shareholders will reduce the conflict between managers and stockholders.

Note: Question No. 1 continues on page 3

Question 1 (continued)

(4) An investment under consideration has a payback of seven years and an initial cost of $200,000. Assume the cash flows are normal cash flows. If the required return is 10 percent, what is the worst-case NPV (rounded to nearest $1)?

(A) $20,673
(B) -$50,722
(C) -$75,238
(D) -$97,368
(E) None of the above

(5) Which of the following statements is most CORRECT?

(A) A higher Days Sales Outstanding is an indication of better financial health of a company.
(B) Interest expense reduces net income and also reduces operating cash flow.
(C) Dividends paid reduce the net income that is reported on a company's income statement.
(D) Interest expense reduces net income but has no impact on operating cash flow.
(E) Both (A) and (B) are correct.

(6) You intend to save $500 per month for 5 years and thereafter save $800 per month for another 7 years. The first monthly saving is at the end of the current month. The nominal rate of return on your investment is 6% per year. Calculate the amount of funds you should receive at the end of 12 years (rounded to nearest $100).

(A) $124,500
(B) $130,800
(C) $136,300
(D) $140,200
(E) None of the above

Note: Question No. 1 continues on page 4

Question 1 (continued)

(7) Using its required return of 8%, the intrinsic value of stock ABC is calculated to be $100. The actual stock price in the market is $98.50. You buy ABC stock today and hold it for 1 year. During this one-year period, investors' risk aversion increased significantly. Assume ABC's stock is in equilibrium at the end of the investment period. Which of the following statements is most CORRECT?

(A) The expected return at the time of purchase is more than 8% and the realized return over the 1-year holding period can be negative.

(B) The expected return at the time of purchase is more than 8% and the realized return over the 1-year holding period cannot be negative as all realized returns must be positive.

(C) The expected return at the time of purchase is less than 8% and the realized return over the 1-year holding period can be negative.

(D) The expected return at the time of purchase is more than 8% and the required return after the 1-year holding period is less than 8% as ABC stock's price would have fallen during this one year.

(E) Statements (B) and (D) are correct.

(8) Which of the following statements is most CORRECT?

(A) The more liquid the trading of a corporate bond is, the higher its liquidity premium will be.

(B) Other things held constant, a 5-year 8% annual coupon bond has more reinvestment rate risk than a 15-year 6% annual coupon bond.

(C) The price of a 3-year, 7% coupon bond is more sensitive to changes in interest rates than the price of an 8-year, 2% coupon bond.

(D) Over the same investment period, the capital gains yield on Bond AA is less than the capital gains yield on Bond BB; therefore Bond AA must have a lower yield to maturity than Bond BB.

(E) On an expected yield basis, the expected capital gains yield will never be negative because an investor would not purchase a bond with an expected capital loss.

(9) Which of the following statements is most CORRECT?

(A) Catering theory assumes that corporations adapt their dividend policy to the preference of their current dominant group of share investors.

(B) Stock price rising following a dividend increase can only be explained by the bird-in-the-hand theory.

(C) Stock price rising following a dividend increase can be explained by the tax preference theory (in the U.S. context).

(D) Stock price rising following a dividend increase can only be explained by the signaling hypothesis.

(E) Stock price rising following a dividend increase can be explained by the bird-in-the-hand theory or the signaling hypothesis.

Note: Question No. 1 continues on page 5

Question 1 (continued)

(10) Assume a project has normal cash flows, i.e., it has a cash outflow followed by a series of cash inflows. Keeping all else unchanged, which of the following statements is CORRECT?

(A) The project's IRR increases as the WACC declines.
(B) The project's IRR decreases as the WACC declines.
(C) The project's NPV decreases as the WACC increases.
(D) The project's MIRR is unaffected by changes in the WACC.
(E) The project's discounted payback decreases as the WACC increases.

(11) Fabo Transport's 6-year bonds currently yield X%. The real risk-free rate, r*, is 3.5% and is assumed to be constant. The maturity risk premium (MRP) is estimated to be 0.15% (t - 1), where t is equal to the time to maturity measured in years. The sum of default risk premium and liquidity premium for this company's bonds is 1.8%, and is believed to be the same for all bonds issued by this company. The average inflation rate is expected to be 5.5% for years 7, 8 and 9, and the yield on a 9-year bond issued by Fabo Transport is 10.5%. Disregard cross-product terms, i.e., if averaging is required, use the arithmetic average. The value of X% is closest to:

(A) 9.3%
(B) 8.4%
(C) 8.1%
(D) 7.8%
(E) 7.6%

(12) 30 years ago, your father purchased an antique vase for $5,000. Now, your father plans to sell the antique vase for $20,747.58. Assuming semi-annual compounding, the nominal rate of return that your father gets from this investment is closest to:

(A) 2.4%
(B) 3.2%
(C) 4.2%
(D) 4.8%
(E) 6.2%

(13) Which of the following statements is most CORRECT?

(A) If management spends lavishly on personal perks, a company should decrease debt to have less interest payments.
(B) The optimal capital structure maximizes earnings per share of a company.
(C) Signaling effect of **stock issue** leads one to conclude that announcement of a new share issue is a positive signal.
(D) Even though the cost of debt is always lower than the cost of equity, it is possible that the WACC of a company can increase when financial leverage is increased. This is possible even though the company will then have more of its capital structure in debt which has a relatively lower cost than equity.
(E) Applying the Hamada equation, one concludes that the cost of equity will decline when a company increases financial leverage as the company enjoys greater tax savings arising from the increased interest expense.

Note: Question No. 1 continues on page 6

Question 1 (continued)

(14) Grower Finance recently reported $3,500,000 of operating costs other than depreciation, and $175,000 of depreciation. The sales for the corresponding period was $7,000,000. The company had no amortization charges, it had $3,000,000 of bonds that carry a 6% interest rate, and its federal-plus-state income tax rate was 40%. Grower's Operating Cash Flow was closest to:

(A) $1,090,000
(B) $2,170,000
(C) $2,225,000
(D) $2,305,000
(E) $2,350,000

(15) Which of the following statements is most CORRECT?

(A) When a business generates a lot of profits, often it makes more sense to incorporate it rather than set it up as a partnership.
(B) A partnership is subject to double taxation: one at the partnership level and one at the personal income tax level of the respective partners.
(C) Unlimited life and typically lower tax rates are both advantages of a partnership.
(D) Unlimited life and typically lower tax rates are both advantages of a corporation.
(E) Limited Liability Partnership is a newer form of partnership while Limited Liability Corporation is not a newer form of partnership.

(16) Nite Tester's stock is currently selling for $45 a share. The stock is expected to pay a $3 dividend at the end of the year. The dividend growth rate is expected to be a constant 5% per year, forever. The risk-free rate is 4% and the required market return is 14%. Assuming the stock is in equilibrium, the beta of this stock is closest to?

(A) 0.77
(B) 0.98
(C) 1.12
(D) 1.27
(E) 1.35

Note: Question No. 1 continues on page 7

Question 1 (continued)

(17) Given the following probability distribution of a stock's return, the Coefficient of Variation (CV) of the stock's returns is closest to:

| Probability | Return |
|---|---|
| 10.0% | 7% |
| 15.0% | 8% |
| 50.0% | 10% |
| 15.0% | 12% |
| 10.0% | 13% |

(A) 0.30
(B) 5.78
(C) 0.82
(D) 1.20
(E) 0.17

(18) Tussa Corp. has sales of $2,000,000 per year, all on credit terms calling for payment within 30 days, and its accounts receivable is $400,000. By how much would its accounts receivable decline (rounded to nearest $1) if the company could take actions that caused all of its customers making on-time payments (i.e. making payments exactly on the maximum number of 30 days allowed under the credit terms), without affecting sales? Assume there are 365 days in a year.

(A) $180,688
(B) $198,726
(C) $222,400
(D) $235,616
(E) None of the above

(19) Lazarus Resources currently has no debt and the required return of its stock is 9.4%. The CEO of Lazarus is considering changing its capital structure to be 50% debt and 50% equity. Its corporate tax rate is 40%, the risk-free rate is 5% and the required market return is 9%. What will be Lazarus' weighted average cost of capital (WACC) under the new capital structure, given that the yield to maturity of its debt at the new capital structure level is 8%? Round your answer to the nearest 0.1%.

(A) 7.8%
(B) 8.4%
(C) 8.8%
(D) 9.2%
(E) None of the above

Note: Question No. 1 continues on page 8

Question 1 (continued)

(20) Let $C_0$ be the initial cash flow of a project. Which of the following statements is most CORRECT? (Hint: if $C_0 > 0$ and all future cash flows are negative, the project is a financing project, for example, a firm engaging this type of project borrows $C_0$ and the future negative cash flows are the repayments for this borrowing.)

(A) If $C_0 < 0$ and all future cash flows are positive, reject the project if the internal rate of return is greater than or equal to the discount rate.

(B) If $C_0 < 0$ and all future cash flows are positive, accept the project if the internal rate of return is less than the discount rate.

(C) If $C_0 > 0$ and all future cash flows are negative, reject the project if the internal rate of return is less than or equal to the discount rate.

(D) If $C_0 > 0$ and all future cash flows are negative, reject the project if the internal rate of return is greater than the discount rate.

(E) The IRR analysis cannot be used for acceptance and rejection of a project if $C_0 > 0$ and all future cash flows are negative.

(TOTAL: 80 marks)

SECTION B

Question 2

(a) Michael borrowed a 20-year mortgage loan from a bank which requires him to pay $1,500 every month. The first payment is at the end of the first month. The nominal rate of this mortgage is 12% per year. Calculate the amount he still owes the bank after 8 years, i.e. after 96 monthly payments have been made (rounded to nearest $1).

(4 marks)

(b) Simon Tan, the CEO of Dreamland, has to decide between the following two competing projects with cash flows as indicated below:

| Year | Project Smally | Project Biggie |
|---|---|---|
| 0 | -$3,600 | -$X |
| 1 | X + 480 | X + 1,200 |
| 2 | 2,880 | 3,600 |
| 3 | 3,600 | 4,800 |

The weighted average cost of capital (WACC) for either project is 10%. X is a positive number. If $X < $Y, then Simon would prefer Project Biggie for all values of X. Calculate the value of Y (rounded to nearest $1).

(6 marks)

(c) The stock of Cellutase Corp. just paid a dividend of $D_0$. The dividend is expected to increase at a rate of 8% per year for 3 years, and at a rate of 6% per year in the fourth and fifth year, and at a constant growth rate of 3% per year forever after that. The required return of its stock is 12% per year. If the intrinsic value of this stock after 5 years is $114.69 (i.e. $P_5$ = $114.69), calculate the value of $D_0$ (rounded to nearest $0.01).

(5 marks)

(d) Project XYZ is a 3-year project and requires an initial investment of $25,000. The cash flows are $12,000, $18,000 and $22,000 in Year-1, Year-2 and Year-3 respectively. The weighted average cost of capital for this project is 7%. Calculate the Equivalent Annual Annuity (EAA) of this project (rounded to nearest $10).

(5 marks)

(TOTAL: 20 marks)

**- END OF PAPER -**

Appendix 1

## Selected Formulas

### Chapter 3

$$\text{Stockholders' equity} = \text{Paid-in capital} + \text{Retained earnings}$$

$$\text{Stockholders' equity} = \text{Total assets} - \text{Total liabilities}$$

Net operating working capital (NOWC)
= Current assets – (Current liabilities – Notes payable)

$$\text{Operating income (or EBIT)} = \text{Sales revenue} - \text{Operating costs}$$

$$\text{FCF} = [\text{EBIT}\,(1 - \text{T}) + \text{Depreciation}] - [\text{Capex} + \text{Increase in NOWC}]$$

### Chapter 4

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Quick, or acid test, ratio} = \frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$$

$$\text{Inventory turnover ratio} = \frac{\text{Sales}}{\text{Inventories}}$$

$$\text{Days sales outstanding (DSO)} = \frac{\text{Receivables}}{\text{Average sales per day}} = \frac{\text{Receivables}}{\text{Annual sales}/365}$$

$$\text{Fixed assets turnover ratio} = \frac{\text{Sales}}{\text{Net fixed assets}}$$

$$\text{Total assets turnover ratio} = \frac{\text{Sales}}{\text{Total assets}}$$

$$\text{Debt ratio} = \frac{\text{Total debt}}{\text{Total assets}}$$

$$\text{Debt-to-capital ratio} = \frac{\text{Total debt}}{\text{Total capital}} = \frac{\text{Debt}}{\text{Debt + Equity}}$$

$$\text{Debt-to-equity ratio} = \frac{\text{Total debt}}{\text{Total equity}} = \frac{\text{Debt}}{\text{Equity}}$$

$$\text{Times-interest-earned (TIE) ratio} = \frac{\text{EBIT}}{\text{Interest charges}}$$

$$\frac{\text{D}}{\text{E}} = \frac{\text{D/A}}{1 - \text{D/A}} \quad \text{and} \quad \frac{\text{D}}{\text{A}} = \frac{\text{D/E}}{1 + \text{D/E}}$$

Note: Appendix 1 continues on page 11

Appendix 1 (continued)

$$\text{Operating margin} = \frac{\text{Operating income (EBIT)}}{\text{Sales}}$$

$$\text{Profit margin} = \frac{\text{Net income}}{\text{Sales}}$$

$$\text{Return on total assets (ROA)} = \frac{\text{Net income}}{\text{Total assets}}$$

$$\text{Basic earning power (BEP)} = \frac{\text{EBIT}}{\text{Total assets}}$$

$$\text{Return on investors' capital (ROIC)} = \frac{\text{EBIT}(1-\text{T})}{\text{Total capital}} = \frac{\text{EBIT}(1-\text{T})}{\text{Debt}+\text{Equity}}$$

$$\text{Return on common equity (ROE)} = \frac{\text{Net income}}{\text{Common equity}}$$

$$\text{Price/Earnings (P/E) ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

$$\text{Book value per share} = \frac{\text{Common equity}}{\text{Shares outstanding}}$$

$$\text{Market/Book ratio (M/B)} = \frac{\text{Market price per share}}{\text{Book value per share}}$$

$$\begin{aligned}\text{ROE} &= \text{Profit margin} \times \text{Total assets turnover} \times \text{Equity multiplier} \\ &= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Total common equity}}\end{aligned}$$

**– END OF APPENDIX 1 –**

# BU8201 BUSINESS FINANCE

Please read the following instructions carefully:

1. **Please do not turn over the question paper until you are told to do so. Disciplinary action may be taken against you if you do so.**

2. You are not allowed to leave the examination hall unless accompanied by an invigilator. You may raise your hand if you need to communicate with the invigilator.

3. Please write your Matriculation Number on the front of the answer book.

4. Please indicate clearly in the answer book (at the appropriate place) if you are continuing the answer to a question elsewhere in the book.