



## Finance

Mid-Term Exam – Spring 2012/2013

1 hour and 30 minutes

Version A

This exam consists of 20 questions. Each question is worth 1 point. Work out the problems on scratch paper without any rounding up the partial results. Write down the correct answer with four decimal places on the line provided. No explanation is required. **No partial credit will be given even if the mistake that is made is obvious.**

This is a closed book exam. Calculators are permitted. Good luck!

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*Print Name*

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*Print Number*

**Problem 1**

What is the stated annual interest rate with monthly compounding *equivalent* to a stated annual interest rate with quarterly compounding of 5%?

Answer: \_\_\_\_\_

**Use the following information to answer Problems 2-3:**

You borrow 100,000 euros for five years with semi-annual installments.

**Problem 2**

What is the installment if the stated annual interest rate is 8%?

Answer: \_\_\_\_\_

**Problem 3**

What is the outstanding debt three years from today?

Answer: \_\_\_\_\_

**Problem 4**

How many years does it take a deposit of 10,000 euros to grow to 20,000 euros if the stated annual interest rate is 2% with daily compounding (365 days per year)?

Answer: \_\_\_\_\_

**Problem 5**

Your living expenses are 40,000 euros in the first of year of retirement and grow at 3% per year during the retirement period. How much you have to invest every year (starting one year from now) while you work in a pension plan that offers an effective annual interest rate of 6%? Assume you work for 45 years and the retirement period is 10 years.

Answer: \_\_\_\_\_

**Use the following information to answer Problems 6-8:**

Consider a bond with a coupon rate of 6% with semi-annual frequency and face value of 100 euros. The yield to maturity of a bond with comparable risk is 5%.

**Problem 6**

What is the bond clean price if maturity is 5 years?

Answer: \_\_\_\_\_

**Problem 7**

What is the bond dirty price if maturity is 5 years and 2 months?

Answer: \_\_\_\_\_

**Problem 8**

What is the bond clean price if maturity is 5 years and 2 months?

Answer: \_\_\_\_\_

**Use the following information to answer Problems 9-11:**

A 1-year zero coupon bond price is 96.15% and a 3-year zero coupon bond is 86.38% of face value.

**Problem 9**

What is three-year spot rate?

Answer: \_\_\_\_\_

**Problem 10**

What is the forward rate from year 1 to year 3?

Answer: \_\_\_\_\_

**Problem 11**

What is the clean price of a 2-year bond with coupon rate of 8% with annual frequency and face value 100 euros if the forward rate from year 1 to year 2 is 5.25%?

Answer: \_\_\_\_\_

**Problem 12**

What is the estimated annual growth rate of a stock with an expected annual return of 10% and a dividend yield of 1%?

Answer: \_\_\_\_\_

**Problem 13**

What is the plowback of a stock with a growth rate of 8% and return on equity of 10%?

Answer: \_\_\_\_\_

**Problem 14**

A stock pays a dividend of 1 euro over the next five years and then dividends grow forever at 3%. What is the stock price? Assume the discount rate is 10%.

Answer: \_\_\_\_\_

**Problem 15**

A stock has earnings per share of 1 euro and payout ratio of 100%. What is the stock price if the company decides to invest next year earnings per share in a project with a return on equity of 30% (there are no other investment opportunities)? Assume the discount rate is 10%.

Answer: \_\_\_\_\_

**Problem 16**

What is the price-earnings ratio of a stock with a payout ratio of 100% in the following year and a payout ratio of 40% and growth rate of 3% thereafter? Assume that the discount rate is 10%.

Answer: \_\_\_\_\_

**Problem 17**

Sales are 10 million euros and the EBIT to sales ratio is 20%. What is the project free cash flow if depreciation equals CAPEX and net working capital is zero? Assume the corporate tax rate is 30%.

Answer: \_\_\_\_\_

**Use the following information to answer Problems 18-20:**

Consider an investment project with initial CAPEX of 60 million euros and next year cash flow of 5 million euros that will grow forever at 5%. The discount rate is 10%.

**Problem 18**

What is the net present value (NPV)?

Answer: \_\_\_\_\_

**Problem 19**

What is the internal rate of return (IRR)?

Answer: \_\_\_\_\_

**Problem 20**

What is the profitability index?

Answer: \_\_\_\_\_