



Finance

Mid-Term Exam – Fall 2012/2013

Version A

1 hour and 30 minutes

This exam consists of 20 questions. Each question is worth 1 point. Work out the problems on scratch paper without any rounding up of 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. You are allowed one double-sided A4 sheet of notes. Calculators are permitted. Good luck!

Print Name

Print Number

Name: _____ Number: _____

Use the following information to answer Problems 1-3:

Becas, your bank manager, suggests you should invest € 700 in a savings account with an interest rate of 5% (stated annual) with monthly compounding.

Problem 1

If you follow Becas' advice, how much will you have in 3 years time?

Answer: _____

Problem 2

What is the effective annual rate (EAR) of this savings account?

Answer: _____

Problem 3

How much should you deposit every month in this account if you want to withdraw exactly € 3,000 in three years? Consider that you do the first deposit today and then make equal deposits every month.

Answer: _____

Use the following information to answer Problems 4-6:

Egas borrowed € 80,000 today to buy an apartment. The loan will be paid back through constant monthly installments during 10 years, and starting next month. The loan interest rate is 3% (stated annual).

Problem 4

What is the value of the installment?

Answer: _____

Problem 5

How much will Egas owe the bank after the payment of the second installment?

Answer: _____

Problem 6

What is the value of the monthly installment, if the first installment is to be paid exactly one year from now (maintaining 10 years of monthly intallments)?

Answer: _____

Name: _____ Number: _____

Use the following information to answer Problems 7-10:

The following zero coupon and annual coupon bonds, with a face value of € 100, are available in the market:

Maturity	Dirty Price	Coupon Rate
0.5 year	104,02	5%
1 year	97,56	0%
1.5 year	95,52	0%
2 years	108,04	8%

Problem 7

What are the 1-year and the 1.5 years maturity spot rates?

Answer: _____

Problem 8

What are the 0.5 and 2 years maturity sport rates?

Answer: _____

Problem 9

What is the forward rate from 1.5 years to 2 years?

Answer: _____

Problem 10

What is the clean price of a 8% coupon bond that pays annual coupons and matures in one semester?

Answer: _____

Problem 11

What is the dirty price of a 5% coupon bond that pays annual coupons and matures in one and a half (1.5) years?

Answer: _____

Name: _____ Number: _____

Use the following information to answer Problems 12-16:

Company XPTO is a publicly-listed company with 1,000,000 shares outstanding that generates constant earnings of € 25,000,000 per year. The company has just distributed dividends to its shareholders. The appropriate discount rate is 10%.

Problem 12

If the company behaves as a cash cow, what is the price per share today?

Answer: _____

Problem 13

What would be the required rate by investors if the price per share of Company XPTO was € 100?

Answer: _____

Problem 14

If company XPTO decides to change its dividend policy such that it starts retaining 40% of its earnings every year (starting exactly one year from now) to invest each year in growth opportunity projects that allow earnings to grow at a rate of 5% per year forever, what is the value of the NPVGO?

Answer: _____

Problem 15

What is the current price per share if the firm decides to change its dividend policy according with the previous question?

Answer: _____

Problem 16

Imagine that the Financial Advisor of XPTO tells you that the value of the company will increase further if the company starts retaining 80% of its earnings instead of the above 40%. In this case, earnings will grow at a rate of 6% per year forever. Is the Financial Advisor right or wrong? What is the value of the NPVGO and what is the new price of the share?

Answer: _____

Name: _____ Number: _____

Use the following information to answer Problems 17-19:

A company must choose between the two mutually exclusive perpetual projects with the following cash flows (in Euros):

	Project A	Project B
Year 0	-1500	-750
Year 1	400	245
Perpetual growth rate	2%	3%

The appropriate discount rate is 10% for both projects.

Problem 17

What are the NPVs of projects A and B?

Answer: _____

Problem 18

What are the internal rates of return of projects A and B?

Answer: _____

Problem 19

Which project should the company choose (or none of them)?

Answer: _____

Problem 20

You have an idea to buy a bakery machine to make a special type of bread. The machine costs € 150. If your business is a success, you can estimate the annual free cash flow to be € 20 in perpetuity. If the business does not succeed as you imagined, the annual free cash flow is always € 5.50. Success and failure are equally likely next year. Also, your “fortune” will never reverse in the future (i.e. if it is a failure in year 1, it will remain so in the years to come; success in year 1 will also be forever). You will need to wait one year to know if the project is a success or a failure. Discount rate is 10%. At any time, you can sell the machine at second-hand market prices (it is € 100 today). Obviously, if you sell the machine, your future cash flow goes to zero and your business is closed, as you cannot produce any more bread.

What is the NPV of the project, with and without the option to shut down your business?

Answer: _____