



UNIVERSIDADE TÉCNICA DE LISBOA
INSTITUTO SUPERIOR DE ECONOMIA E GESTÃO
Quantitative Finance



EXAM – 2012/13

2 hours duration

Lisboa, 09/11/2013

Full Name: _____

Process Number: _____ **Licenciatura/Course:** _____ **Turma/Class:** _____

Read the resolution before starting the exam:

- ▶ On the desk you should leave only: writing materials, calculator, and identification card;
- ▶ All the required equation and formulas are provided at the back of the examination sheet;
- ▶ No books, notes or reference materials may be used;
- ▶ Fill in your identification on all examination sheets (any sheets without a name will not be considered);
- ▶ Scratch paper will be given before the exam starts;
- ▶ Mobile phones or calculators with communication devices should be disconnected. Failure to comply with this rule implies the immediate cancellation of the exam;
- ▶ No doubts will be answered during the exam. Should you have any doubt related with the interpretation of any question, you should submit with the answer a clear statement of any assumption made,
- ▶ All exercises should be answered on the examination sheet;
- ▶ Write in a clear way. If your answer is not readable, it will not be considered;
- ▶ You are only allowed to leave the room 1 hour after the start of the exam. In this case, you cannot return;
- ▶ **Good luck!**

Answer Grid

Correction Grid

1st Part

	a)	b)	c)	d)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

↓ RESERVED FOR THE LECTURE ↓

1ª Parte	
Múltiplas	

11.	
12.	

2ª Parte

1.	
2.	
3.	
4.	
TOTAL	



EXAM – SEPTEMBER - 2012/13

Full Name: _____

Student Number: _____ Licenciatura/Course: _____ Turma/Class: _____

Group 1 (5 val.)

Fill in the grid for this group on page 1, by putting the symbol X in the cell corresponding to the answer (letter) you think is correct for each question. For each correct answer you get 0,625, for each incorrect answer you get -0,156. The lowest mark you can have in this group is 0.

- Under compound interest, Mr. Rock will deposit 100€ monthly, at the end of each month, during 10 years. Consider an interest rate of 9% convertible monthly. At the end this 10 year period, Mr. Rock will have a cumulative value of:
 - € 12.000,00 if the terms are constants;
 - € 7.894,17 if the terms are anticipated;
 - € 19.351,43 if the terms are normal;
 - None of the above.
- An annual interest rate of 15% with quarterly capitalizations, is equivalent to an effective annual rate of:
 - 15,7625%
 - 3,75%
 - 15,8650%
 - None of the above.
- The ZW company borrowed €15.000 with an interest rate of 8% per year. The loan will be paid all at once, all inclusive, with a value of € 18,042.98. Considering the regime of compound interest, which is the term of this loan?
 - 1 year, 2 months and 12 days
 - 2 years, 5 months and 24 days
 - 7 months and 7 days
 - None of the above.
- Under compound interest, which the average annual interest rate is equivalent to the following annual rates: 1st year = 3%, 2nd year = 5%, 3rd year = 5%? (Approximately)
 - 4,3291%
 - 4,3333%
 - 3,7853%
 - None of the above.
- Under simple interest and an annual interest rate of 8%, which is the investment required to generate an accumulated capital of € 2,000.00 after 9 months?
 - € 1.887,83;
 - € 1.886,79;
 - € 2.120,00;
 - None of the above.
- Consider a lease contract on an equipment worth € 30.000. The lease contract defines 36 monthly constant payments (annuity due). The monthly effective rate will be 0.75% and the residual value is zero. What is the value of each payment?
 - € 953,99;
 - € 833,33;
 - € 946,89;
 - None of the above.

7. €36.000 is invested at a semiannual rate of 5,0%, compounded continuously, during five years. This investment will produce an accumulated capital of:
- a) € 59.354,00;
 - b) € 57.968,03;
 - c) € 45.946,14;
 - d) None of the above.
8. An investor bought 200 bonds, at par, on 1st March, 2012 for € 3,000 and sold them on 1st June, 2013. The bonds bear annual effective interest rate of 7% effective. The interest was paid on 1 September. Knowing that the investor obtained an effective annual rate of return of 8.16%, which is the sale value of these bonds?
- a) € 3.210,00;
 - b) € 3.273,57;
 - c) € 3.086,34;
 - d) There is insufficient data to answer this question.

Group 2 (3 val.)

Comment the following sentence: "Which is worth more: a discount at a bank discount of 5% or interest at an interest rate of 5%? Why?"

Comment the following sentence: "A deferred annuity always has a present value lower than the same ordinary annuity"

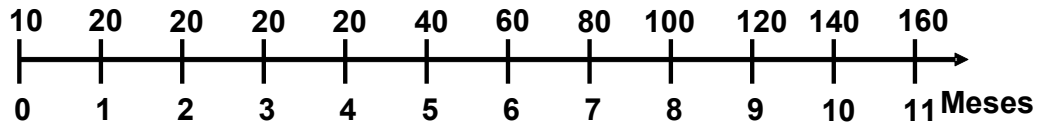
Group 3 (2,5 val.)

Full Name: _____

Student Number: _____ Course: _____ Turma/Class: _____

For the following question, use the space provided below.

The company Corporate should reimburse following monthly debt payments (in Euros):



Using the annuity formulas, indicate the expression to compute the value of debt at time 0. Consider a semi-annual interest rate, with monthly capitalizations, of 4,5% during the first 4 months and a semi-annual interest rate, with monthly capitalizations, of 6,0% after that period.

Full Name: _____

Student Number: _____ Licenciatura/Course: _____ Turma/Class: _____

Group 4 (3,5 val.)

In this group write your answer in space provided below the question. Do not forget to present the formulas and intermediate calculations that allowed you to arrive at the result.

The company ANDERS borrowed from the Bank CIF a total of €12.000. This loan will be paid off through 36 constant quarterly payments (capital + interest). The interest rate is the nominal annual of 8,0%. It is known that the first payment will occur one semester after the loan contract date.

a. Determine the amount of each payment of this loan.

b. Fill out the following lines of the amortization table (Euros).

Period (Quarter)	Debt at beginning of the period	Interest	Payment	Amortization	Accumulative Amortization	Debt at end of the period
1						
2						
36						
37						

Full Name: _____

Student Number: _____ Licenciatura/Course: _____ Turma/Class: _____

Group 5 (3,0 val.)

In this group write your answer in space provided below the question. Do not forget to present the formulas and intermediate calculations that allowed you to arrive at the result.

On May 3, 2004 Valera bids 96,2 on 182-day \$500.000 T-bill deal.

a) Find the present value and future value of those T-Bills.

b) On August 5, 2004 Valera sells the T-Bills to an investor desiring a 6,0% simple interest rate return on the investment. Find the amount the investor paid for the T-bills.

Full Name: _____

Student Number: _____ Licenciatura/Course: _____ Turma/Class: _____

Group 6 (3,0 val.)

In this group write your answer in space provided below the question. Do not forget to present the formulas and intermediate calculations that allowed you to arrive at the result.

The company BONDS decided to issue a bond loan, the conditions were as follows:

- Date of issue: 01/03/N.
- Nominal value: 12,00 Euros (par)
- Issued at par
- Number of Bonds: 800 000.
- Loan term: 3 years.
- Semi-annual coupon rate of 6,0%.
- Payment of semi-annual interest.
- First interest payment: 6 months after issuance.
- Mode of redemption: Repayment of bonds in 2 equal batches (number of bonds).
- Date of first redemption: two years after issuance.
- Date of second redemption: three years after issuance.
- Redemption premiums € 0.40 (1st redemption) and € 0.80 (2nd redemption)

a) Fill out the following lines for the amortization table for this bond loan.

Period (Quarter)	Debt at beginning of the period	Interest	N.º of redemption bonds	Amortization	Redemption Premium	Total payment (interest+amortization)
1						
2						
3						
4						
5						
6						

b) Consider that an investor purchased 400 bonds of this loan in the next day after the first redemption. The second batch of bonds was reimbursed, and the investor obtained an effective semi-annual rate of return of 6.50%. Compute the value that the investor paid for each of those bonds.