ISCTE Business School Instituto Universitário de Lisboa	**FUNDAMENTALS OF FINANCE**

Evaluation: Exam

Date: 3rd June 2015

Duration: 120 minutes

Name: _____

School ID Number: _____ **GAi**

GRADE

GROUP 1	
GROUP 2	
GROUP 3	
GROUP 4	
GROUP 5	
TOTAL	

Please pay attention to the following information:

The test may be done with pen or pencil;

For supporting additional calculations you should use the existing sheet for that purpose;

We do not clarify any doubts during the test, so if you need to take some assumption, please do so (in writing) and respond accordingly;

It is possible to use calculators;

With the exception of the formulas sheet, the rest of the test cannot be unstapled;

The rounding should be carried out to 4 decimal places to interest rates, foreign exchange rates and intermediate calculations (ex: 0.1234) and 2 decimal places for values (ex: 1, 234.12 Euros).

In multiple-choice questions the answer will only be considered if written on the square on the right, given for that purpose. Each wrong answer corresponds to a loss of 0.5 points on the final grade of the test (0.15 points for the True/False answers).

GROUP 1

1. 1. (1.5 points) A company has contracted a 2,600,000 EUR loan in Bank B for 91 days, which will pay 28,753.47 EUR in interest. At the moment of signing, the 3 months EURIBOR was equal to 1,621%. The spread applied by Bank B to the loan granted to this company was:

   A. 2.754%

   B. 4.375%

   C. 1.621%

   D. 0 (zero)

2. (0.5 points each) Consider two alternatives for investment in bank deposits, one in EUR and the other in GBP. Of the following statements, identify the True (T) and False (F):

   a. the option for deposit in GBP by an investor resident in Portugal can imply that the value received in EUR at the end can be lower than the corresponding value applied in EUR. ☐

   b. with an exchange rate EUR/GBP at the time of deposit equal to 0.7099, an investor resident in the United Kingdom can deposit 1.4086 EUR per each GBP invested (consider rounding to 4 decimal places). ☐

   c. the deposit in EUR represents an investment of lower risk than the acquisition of shares quoted in EUR of the Bank in which the deposit would be done. ☐

GROUP 2

3. (1.5 points) In a credit operation (Bank loan), which of the following charges are not included in the calculation of the EGAR?

   A. Interest on Debt.
   B. Credit opening fee.
   C. Management fee of the Cash Deposit Account of the client.
   D. Stamp Tax on paid interest of the loan.

4. (1.5 points) The effective rate for the semester that corresponds to the effective monthly rate of 0.8% is …....

   A. 4.8000%.
   B. 4.8970%.
   C. 4.4535%.
   D. None of the above.

5. (1.5 points) At what price should I sell a property that generates a perpetual monthly income of 500 euros, knowing that my annual opportunity cost if 6% (stated rate)?

   A. 102,721.07 euros.
   B. 8,333.33 euros.
   C. 100 thousand euros.
   D. None of the above.

6. (2.5 points) In a company, a 500 thousand euros loan will be paid in the following conditions:

   - stated annual rate of 8%.
   - total maturity of 20 semesters.
   - deferment of 2 semesters.
   - additional grace period of 2 semesters (after the deferment).
   - in the remaining semesters: constant installment of capital and interest paid at the end of each period.

   a) What is the value of the constant installment for the remaining semesters after the deferment and grace period?

b) If after 10 semesters of the beginning of the contract, the company is able to pay the debt, which is the mathematical expression that allows the calculation of this debt?

c) If all cash flows occurred at the beginning of the corresponding period instead of at the end, the value of the constant installment of capital and interest computed in a) would be a higher value. [indicate whether this statement is true (T) or false (F)]

GROUP 3

7. (1.5 points) A company has a Net ROA equal to 10%, a Net Income of 150 and a financial autonomy of 40%. It is subject to an income tax rate of 25%, and the average cost of the liability is of 5%. What is the value of the Gross ROA?

   A. Gross ROA = 13.33%.

   B. Gross ROA = 14.33%.

   C. Gross ROA = 15.33%.

   D. Gross ROA = 16.33%.

   E. None of the above answers is correct.

8. (1.5 points) Assuming that the company has a Gross ROA that is bigger than the Liabilities average cost and that has a positive Equity:

   A. The ROE will always be bigger than the Gross ROA, because the financial leverage is positive.

   B. The ROE will always be smaller than the Gross ROA, because the financial leverage is negative.

   C. Only with more information can we know which is the higher, ROE or Gross ROA.

   D. The ROE is always lower than the Gross ROA, as the shareholder return must always be lower than the return that the company gets from its assets at the operational level.

   E. If total liabilities is higher than Equity, then the ROE is higher than the Gross ROA.

GRUPO 4

9. (2 points) A company presents a negative Liquidity indicator of -10 thousand euros.

Additional Information:

- Its equity is equal to 100 thousand euros and has 25 thousand euros in non-current liabilities;
- Its non-current assets amounts to 100 thousand euros.
- The company has in its current assets a value of Operating Cash amounting to 7 thousand euros and Trade Receivables of 20 thousand euros (corresponding to total Revenues of 200 thousand euros and a Receivables average term of 1 month.
- Regarding current liabilities, the company owes the State 4 thousand euros in operating taxes.
- The company also owes to suppliers, to which contributed a cost of goods and consumed materials in the amount of 100 000 euros, a variation of stocks of 10 thousand euros and External Supplies of 30 thousand euros (values without VAT). The Payment average term is 1 month, and the rate of the VAT paid is equal to the deductible VAT.

a) Determine the value of the Net Permanent Capital.

b) Determine the value of the Working Capital.

c) Determine the Balance Sheet value for Inventory.

GROUP 5

10. (2 points) A company is considering investing in a new project that has sunk costs of 20 thousand euros. This project involves an investment in the year 0 of 200 thousand euros, and has no other investment in the course of the project. It is expected that the PI is 1.35 and it is also known that the DPP is 3 years, the project will have a lifetime of 4 years (including the year of disinvestment). The cash flows from year 1 and 2 are respectively of 40 and 60 thousand euros. The discount rate is 8%. Determine the cash flows of year 0, year 3 and year 4.

11. (1.5 points) Select the false statement:

A. I should accept an investment project if the NPV is higher than 0.

B. I should accept an investment project if the IRR is higher than the minimum rate required by investors.

C. I should accept an investment project if the PI is higher than 1.

D. I should accept a project if the DPP is higher than the lifetime of the project.

12. (1.5 points) A project has a planned initial investment of 50 thousand euros and will generate cash flows of 20, 25 and 30 thousand euros in years 1, 2 and 3. The discount rate of this project is 8%. Choose the correct answer:

A. The NPV of this project is 12.77.

B. The NPV of this project is 13.77.

C. The DPP of this project is 3.

D. Both B) and C) are correct.

SUPPORTING CALCULATION

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FORMULAS

Simple Interest	Compound Interest
$M = C + C \times n \times r$	$M = C \times (1 + r)^n$
$C = \frac{M}{1 + n \times r}$	$C = \frac{M}{(1 + r)^n}$ or $C = M \times (1 + r)^{-n}$
$r = m \times r_m$	$1 + r = (1 + r_m)^m$
	$1 + r = (1 + \frac{r_{(m)}}{m})^m$, where $r_m = \frac{r_{(m)}}{m}$
	$A_{\overline{n}\|r} = \frac{1 - (1 + r)^{-n}}{r}$
	PV Perpetuity = $\frac{T}{r}$
	PV Growing Perpetuity = $\frac{T}{r - g}$

C – principal / present value; M – compound value; PV – present value; T – cash flow

r – effective annual rate

$r_{(m)}$ – stated rate with a frequency of m

r_m – effective rate for the sub-period (can be repeated m times per year)

n – number of compounding times (periods) using the given interest rate

g – growth rate

$$Gross\ ROA = \frac{EBIT}{Assets} = \frac{EBIT}{Revenues} x \frac{Revenues}{Assets}$$

$$Asset\ Turnover = \frac{Revenues}{Assets}$$

$$Net\ ROA = \frac{Net\ Income}{Assets} = \frac{Net\ Income}{Revenues} x \frac{Revenues}{Assets}$$

$$ROE = \frac{Net\ Income}{Equity} = \left(Gross\ ROA + (Gross\ ROA - r) x \frac{Debt}{Equity} \right) x (1 - t)$$

r = Average Cost of Debt

t = Income Tax Rate

$$ROIC = \frac{NOPLAT}{Invested\ Capital}$$

Net Permanent Capital = Permanent Capital – Non-current Assets

Working Capital = Operating Needs – Operating Resources

Liquidity = Net Permanent Capital – Working Capital

Liquidity = Liquidity Asset Elements – Liquidity Resource Elements

Operating Free Cash Flow = EBITDA – Δ Working Capital

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

$$Financial\ Autonomy = \frac{Equity}{Assets}$$

$$Receivables\ Average\ Term\ (in\ months) = \frac{Trade\ Receivables}{Revenues\ with\ VAT}\ x\ 12$$

$$Payables\ Average\ Term\ (in\ months) = \frac{Trade\ Payables}{Total\ Purchases\ with\ VAT}\ x\ 12$$

$$Inventory\ Average\ Duration\ (in\ months) = \frac{Inventory}{Cost\ of\ Goods\ Sold}\ x\ 12$$

Cash Flow of the Project = Operating Cash Flow + Residual Value in Net Working Capital + Disinvestment in Capex – CAPEX – Change in Working Capital

CAPEX = Capital Expenditure (i*nvestment)*

Operating Cash Flow = NOPLAT + Depreciation = EBIT (1 – t) + Depreciation

EBITDA (current prices) = EBITDA (constant prices) (1 + i)

Discount Rate = r = r_f + risk premium

r- discount rate of the project
r_f – risk-free rate

$$r_{(real)} = \frac{1 + r_{(nominal)}}{1 + i} - 1$$

i – inflation rate

$$\text{Net Present Value (NPV)} = \text{Valor Actual Líquido (VAL)} = -I_0 + \sum_{t=1}^{n} \frac{CF_t}{(1 + r)^t} \Leftrightarrow VAL = \sum_{t=0}^{n} \frac{CF_t}{(1 + r)^t}$$

I_0 - CAPEX (initial)
CF_t - cash flow of the project of year t
n – lifetime of the project.

$$\text{Internal Rate of Return (IRR)} = \text{Taxa Interna de Rendibilidade (TIR)} \Leftrightarrow -I_0 + \sum_{t=1}^{n} \frac{CF_t}{(1 + TIR)^t} = 0 \Leftrightarrow \sum_{t=0}^{n} \frac{CF_t}{(1 + TIR)^t} = 0$$

$$\text{Payback Period (PP)} = \text{Prazo de Recuperação do Investimento (PRI)} = T \quad \text{quando} \quad \sum_{t=0}^{T} \frac{CF_t}{(1 + r)^t} = I_0$$

$$\text{Profitability Index (PI)} = \text{Índice de Rendibilidade do Projecto (IRP)} = \frac{\sum_{t=0}^{n} \frac{CF_t + I_t}{(1 + r)^t}}{\sum_{t=0}^{n} \frac{I_t}{(1 + r)^t}}$$

PI is also = (NPV / Discounted CAPEX) + 1