FUNDAMENTALS OF FINANCE

Evaluation: Mini-Test II Date: 17th May 2014 Duration: 75 minutes

Name: ____

School ID Number: _____ GAi

GRADE

GROUP 1	
GROUP 2	
GROUP 3	
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 (0.25 on the TRUE/FALSE ones).

GROUP 1

1. TRC presents the following data (in thousands of euros) for 2013:

EBITDA	500
Depreciation	100
Financial Expenses	200
Assets	4 000
Debt	2 000

A) (1.5 points) Knowing that the company is subject to an income tax rate of 20%, calculate the Gross ROA and ROE.

B) (1.5 points) Consider now that the Operating Needs and the Operating Resources of the company are respectively of 180 thousand euros and 140 thousand euros and that there are 300 thousand euros of non operating assets. Calculate the ROIC.

C) (1.5 points) Knowing that the Working Capital for 2012 was – 60 thousand euros, calculate the Free Cash Flow generated by the activity of the company in 2013. Justify it.

2. (1.5 points) The shareholders are unhappy because the ROE is much lower than the Gross ROA, although the company is exempt from income tax. The best decisions, to resolve this issue, should pass by:

A. increase the Share Capital; decrease the Gross ROA; negotiate the interest on Debt

B. increase the Turnover; repay Debt; increase the Gross ROA

- C. decrease the Share Capital; decrease the Gross ROA; repay Debt
- D. contract a new Bank loan; increase the Margin; negotiate the interest on Debt
- E. none of the previous statements is correct
- 3. (1.5 points) If there are no non operating assets:
- A. the ROIC is equal to the Gross ROA
- B. the Invested Capital is always less than, or at most equals, the Assets
- C. the ROIC increases
- D. all the previous statements are correct
- E. statements B and C are correct

GROUP 2

- 4. (1.5 points) The reduction in the Gross Margin, by the increase in the Cost of Goods:
- A. will increase the WC if the company does not have inventories
- B. will decrease the WC if the company does not have inventories

C. will have a null effect on the WC if the company has inventory and these have the same average duration of the term for trade payables

D. even if the company does not have inventories it is impossible to anticipate the effect on the WC

5. (1.5 points) The VAT position on the Balance Sheet (WC) is 200 euros, relative to a 20% VAT rate and a payment period of 2 months. Knowing that this is a services company which offers a receivables average term of 4 months to its customers, which has no Inventories or Cost of Goods, only has External Supplies amounting EUR 12,000 per year (immediate payment), determine the value of this year's Working Capital.







GROUP 3

6. (3 points) Consider the following investment project (amounts in thousands of euros):

Investment:

Equipment A: acq 400, life of 2 years and selling price of 40

Equipment B: acq 300, life of 3 years and no second-hand-market

EBITDA: 450 in the first year and 500 after

WC: -50 in the first year and 50 after

Corporate Tax rate: 30%

Consider the residual value in Working Capital and the value of the desinvestment in CAPEX in the year following the end of the activity.

Determine the Cash Flows of the project.

7. (2 points) The NPV of a project is 72, the CAPEX is of 80 and the following 4 cash flows are constant. Knowing that the return required by the investors is 10%, calculate the Discounted Payback Period.

- 8. (1.5 points) If the PI is 1.1:
- A. the investment will be recovered only in the last year of the project
- B. the IRR will be 10% higher than the discount rate used in the calculation of the $\ensuremath{\mathsf{NPV}}$
- C. if the CAPEX is 200, the NPV will be $40\,$
- D. statements B and C are true
- E. none of the statements is correct



- 9. (0.75 points) Indicate whether the following statements are true (T) or false (F):
- A. If we increase the Receivables Average Term, the sum of the non discounted cash flows of the project decreases.
- B. In the analysis of a project, the NPV and the DPP always lead to the same decision.
- C. If the IRR is greater than the rate required by the investors, the PI will always be greater than 1.
- D. If there were no taxes the operating cash flow would be equal to the EBITDA.



Supporting Additional Calculations

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FORMULAS

Simple Interest	Compound Interest
$M = C + C \times n \times r$	$\mathbf{M} = \mathbf{C} \times (1+\mathbf{r})^{\mathbf{n}}$
$C = \frac{M}{1 + n \times r}$	$C = \frac{M}{(1+r)^n}$ 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	

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

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

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

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

$$r = Average Cost of Debt$$

$$t = Income Tax Rate$$

$$ROIC = \frac{NOPLAT}{Invested Capital}$$
Working Capital = Permanent Capital – Net non-current Assets

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Net Working Capital = Operating Needs – Operating Resources
Liquidity = Working Capital – Net Working Capital
Liquidity = Liquidity Asset Elements – Liquidity Resource Elements
Operating Free Cash Flow = EBITDA – Δ Net Working Capital
Debt-to-equity = $\frac{\text{Debt}}{\text{Equity}}$
$Financial Autonomy = \frac{Equity}{Assets}$
Receivables Average Term (in months) = $\frac{Trade \ Receivables}{Revenues \ with \ VAT} \times 12$ Pavables Average Term (in months) = $\frac{Trade \ Payables}{Trade \ Payables} \times 12$
Total Purchases with VAT
Inventory Average Duration (in months) = $\frac{Inventory}{Cost of Goods Sold} \times 12$
Cash Flow of the Project = Operating Cash Flow + Residual Value in Net Working Capital + Disinvestment in Capex – CAPEX – Change in Net Working Capital
CAPEX = Capital Expenditure (investment)
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
$\mathbf{r}_{(m)} = \frac{1 + \mathbf{r}_{(nominal)}}{1 - 1}$
1 + i i - inflation rate
Net Present Value (NPV) = Valor Actual Líquido (VAL) = $-I_0 + \sum_{t=1}^{n} \frac{CF_t}{(1+t)^t} \Leftrightarrow VAL = \sum_{t=0}^{n} \frac{CF_t}{(1+t)^t}$
I ₀ - CAPEX (initial) CFt - cash flow of the project of year t n – lifetime of the project.
Internal Rate of Return (IRR) = Taxa Interna de Rendibilidade (TIR) $\Leftrightarrow -I_0 + \sum_{t=1}^n \frac{CF_t}{(1 + TIR)^t} = 0 \Leftrightarrow \sum_{t=0}^n \frac{CF_t}{(1 + TIR)^t} = 0$
Payback Period (PP) = Prazo de Recuperação do Investimento (PRI) = T quando $\sum_{t=0}^{T} \frac{CF_t}{(1+r)^t} = I_0$
Profitability Index (PI) = Índice de Rendibilidade do Projecto (IRP) = $\frac{\sum_{t=0}^{n} \frac{CF_t + I_t}{(1+r)^t}}{\sum_{t=0}^{n} \frac{I_t}{(1+r)^t}} \text{Or}_{PI = (NPV / CAPEX) + 1}$