Faculty of Economics and Business Administration

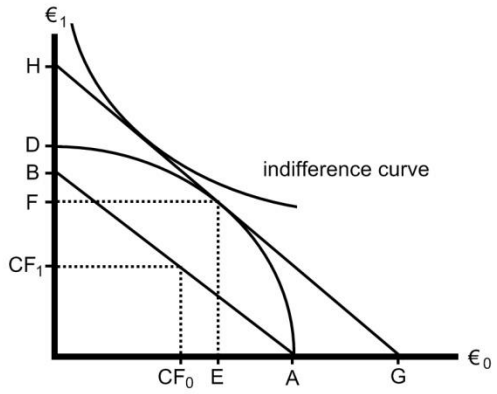
Exam:	Finance	Version A
Code:	E_IBA2_FIN	
Examinator:	Dr. M.B.J. Schauten	
Co-reader:	Dr. M.J. van den Assem	
Date:	21 December 2016	
Time:	15:15 – 17:15 hrs	
Duration:	2 hours	
Calculator allowed:	Yes	
Graphical calculator allowed:	No	
Number of questions:	19	
Type of questions:	16 multiple choice and 3 open	
Answer in:	English	
Remarks:	Answer the **multiple choice questions** by filling the corresponding box on the mc-answering form. Only one answer is correct (a, b, c or d). If you give more than one answer or no answer then your response is counted as wrong. The answers to the **open questions** should be given in the space below the open questions. There is more than enough space to write your answers. Numbers are written in European (Dutch) format with decimal commas, and points separating thousands (e.g. 1.234.567,89). **Write your name on the mc-answering form as well as on this exam form. At the end of the exam you hand in the mc-answering form as well as the exam form with the supervisor**.	
Credit scores:	The maximum score for the mc questions is 72 points. To determine the score we take into account the expected number of correct answers when answers are given randomly. The maximum score for the open questions is 18 points. The final grade for this exam is: [total number of points + 10] / 10.	
Grades:	The grades will be made public at the latest on 18 January 2017.	
Inspection:	Will be announced via Blackboard.	
Number of pages:	12 (including front page)	

Name : _____

Student number : _____

Part A: Multiple Choice questions (72 points)

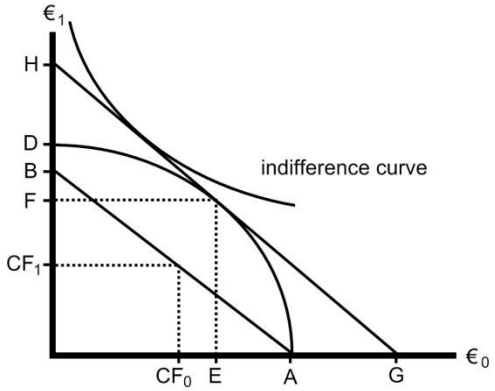
1.
Assume a world according to the Hirshleifer model. At t = 0 Remco borrows €140,00 and his income is €50,00 (CF_0). At t = 1 the revenue of the investment is €102,00 (OF) and Remco's consumption €25,50 (C_1). The risk free interest rate is 2,00%. The figure below is not drawn to scale.



Question: At t = 1 the income of Remco (CF_1) is closest to

a. €40
b. €46
c. €51
d. €66

2.
Assume a world according to the Hirshleifer model. The income of Jack at t = 0 and t = 1 is equal to €100,00 (CF_0) and €102,00 (CF_1), respectively. At t = 0 Jack consumes nothing (C_0) and at t = 1 he consumes €244,80 (C_1). The risk free interest rate is 2,00%. The investment outlay at t = 0 is € 102,00. The figure below is not drawn to scale.



Question: The net present value of the investment (AG) is closest to

a. €40
b. €42
c. €140
d. €142

3.
On March 31 2016 the number of outstanding shares of LukasBolz is equal to 12,5 mln. On that day the price per share is €18. On that day the amount of cash and cash equivalents is €6,5 mln, the receivables €15 mln, the payables €9 mln, the inventories €7 mln and the market value of interest bearing debt €57 mln.

Question: The enterprise value of LukasBolz is closest to

a. €225,0 mln
b. €231,5 mln
c. €275,5 mln
d. €282,0 mln

4.
Company Barjols considers to invest €10.000 (at t = 0) in a new project. The expected cash flows before corporate tax (measured in nominal terms) at the end of year 1 and 2 are €12.000 and €6.000 respectively. The investment of €10.000 will be depreciated straight-line in 2 years to zero on the basis of historical cost. The corporate tax rate is 25,00%. The real cost of capital is 8,00%. The expected inflation is 2,00%.

Question: The net present value of the project is closest to

a. €1.878
b. €3.703
c. €4.043
d. €5.838

5.
Corporation Jung Properties B.V. considers to invest in real estate (a shop-premises). At t = 0 the investment outlay needed is €650.000. The property is rented for the next 4 years to store Akktion. After four years of the contract expires. The contract will not be renewed. At t = 4 the property will be sold for €300.000. This amount will be received at t = 4 – just as the last rental payment. The following table shows the investment expenditure at t = 0 and the expected cash flows at t = 1 to t = 4, realized with the rental of the property. The cost of capital of this project is 5,00%.

T	0	1	2	3	4
Expected cash flow in euros from rental of property	– 650.000	70.000	85.000	90.000	100.000

Question: The net present value of the project is closest to

a. – € 175.000
b. – € 99.409
c. € 0
d. € 550.590

6.
At DekaBank, the annual percentage rate (APR) for a savings account is 2,7500% with monthly compounding.

Question: The effective annual rate (EAR) of this savings account is closest to

a. 2,7500%
b. 2,7543%
c. 2,7849%
d. 2,7874%

7.
Assume a perfect capital market and a flat term structure of interest rates. The 'duration' of bond A is 5,00 and of bond B 6,00. The yield to maturity of bond B is 6,00%. The bonds have no default risk.

Question: The modified duration of bond A is closest to

a. 4,17
b. 4,72
c. 5,00
d. 5,30

8.

Consider a world that satisfies the assumptions of the CAPM. In this world, only three risk bearing securities are traded, A, B and C, as well as a risk-free security F, with a return of 2,00%. The following is known:

Security	**A**	**B**	**C**
E(R)	6,00%	10,00%	14,00%
σ(R)	6,00%	12,00%	18,00%
Number of shares outstanding	40.000	10.000	10.000
Current price per share	€ 10	€ 20	€ 40

The risk of market portfolio M measured in terms of the standard deviation of its return is 8,00%. An investor X, who operates optimally in this world, has a wealth of €30.000. Investor X holds a long position of €15.000 in the risk-free asset F (he lends €15.000).

Question: The risk of the optimal portfolio of investor X measured in standard deviations of its return is closest to

a. 4,00%
b. 6,00%
c. 8,00%
d. 10,00%

9.

Assume an efficient capital market. Assume that r_1 = 0,50%; r_2 = 0,60%; r_3 = 0,70%; r_4 = 0,80%; r_5 = 0,70%; r_6 = 0,60% and r_7 = 0,50%.

Vraag: The one-year forward rate for year 3 ($_2f_3$) and year 5 ($_4f_5$) are closest to

a. 0,90% and 0,30% respectively.
b. 0,30% and 0,90% respectively.
c. 1,10% and -0,10% respectively.
d. 0,70% and 0,10% respectively.

10.
Assume an efficient capital market. Consider three bonds in this world. Bond A has a coupon of 1,0%, bond B has a coupon of 2%. Bond C is a zero coupon bond. The maturity of bond A is 1 year, of bond B 2 years and of bond C 3 years. The bonds are bullets and have no default risk. All bonds have a nominal value of €1.000. The price of bond A is €1.010,00 (or 101,000% of its face value) and the price of bond B is €1.000,39 (or 100,039% of its face value).

Question: The1-year spotrate (r_1) and the 2-year spot rate is closest to

a. 0,00% and 0,00% respectively.
b. 1,00% and 2,00% respectively.
c. 0,00% and 2,00% respectively.
d. 1,00% and 0,00% respectively.

11.
Assume a perfect capital market under certainty. The annual growth rate of the earnings per share of corporation PRINCE is and remains equal to 3,00% (g = 3,00%). Every year, 30,00% of the earnings is being paid out as dividend. The dividend policy will remain unchanged. The discount rate is 5,00%.

Question: The forward P/E ratio of PRINCE (where P is the price at t = 0 and E the earnings per share at t = 1) is closest to

a. 10
b. 12
c. 13
d. 15

12.
Assume a perfect capital market. For firm A and B, the following data is given:

	A	B
Earnings per share at t = 1 (EPS_1)	€5,00	€5,00
Dividend payout ratio	40,00%	40,00%
Annual growth rate of the EPS (g)	?	?
Price at t = 0	€100,00	€200,00
Discount rate	4,00%	6,00%

For both firms we assume that the payout ratio, the annual growth rate of the earnings per share as well as the discount rate remain constant.

Question: Which of the following statements is **true**?

a. At t = 1 the price of A is higher than €100,00.
b. The expected return of A is higher than the expected return of B.
c. The annual growth rate of the earnings per share of A is 3,00%.
d. The annual growth rate of the earnings per share of B is 4,00%.

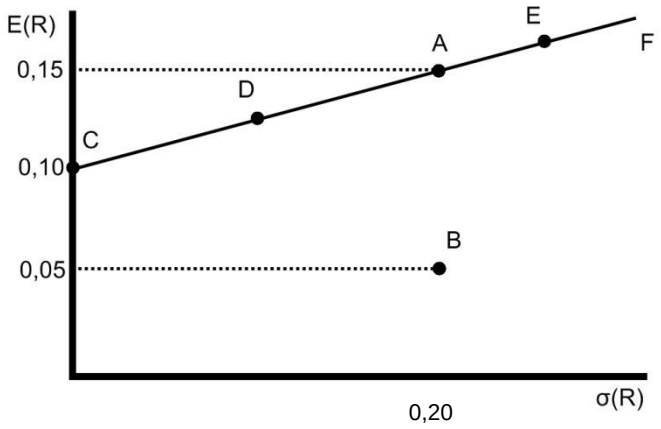
13.
Consider a world in which the assumptions of the portfolio theory hold. Short selling is not allowed. In this world only two securities are traded, security A and B. Security A has an expected return of 8,00% and a standard deviation of the return of 30,00%. Security B has an expected return of 12,00% and a standard deviation of the return of 40,00%. The correlation coefficient between the returns of A and B is 0,5.

Question: The expected return of the minimum-risk portfolio (MRP), i.e. the portfolio with the lowest risk, is closest to

a. 8,92%
b. 10,00%
c. 11,08%
d. 12,59%

14.
Consider a world where the assumptions of the portfolio theory hold. In this world only two risk-bearing securities A and B are traded. Short selling is allowed.

The risk of security A in terms of the standard deviation of its return is 20,0% and equal to the risk of security B. The expected return of security A is 15,0% and the expected return of security B is 5,0%. The correlation coefficient between the returns of A and B is -1,00. The risk-free portfolio C has an expected return of 10,0%.The expected return of portfolio E is 17,0%. With x_A we mean the proportion of security A in the portfolio and with x_B we mean the proportion of security B in the portfolio.



Question: Which of the following statement is **false**?

a. Portfolio E is efficient.
b. For portfolio E it holds that $x_A = 1,1$ en $x_B = -0,1$.
c. A portfolio where $x_A = 0,6$ and $x_B = 0,4$ is efficient.
d. A portfolio where $x_A = 0,5$ and $x_B = 0,5$ has no risk.

15.
Consider a capital market in which the semi strong form of the Efficient Market Hypothesis holds.

Question: Which of the following statements is **the least credible one**, considering this capital market?

a. Investors are unable to earn systematically abnormal returns using historical prices to predict future price movements.
b. It is possible to earn a return higher than expected on a particular stock.
c. Diversification is rational on this market.
d. In this market prices immediately and fully reflect *inside* information.

16.
Firm B considers to acquire firm T. The market value of equity and debt of B as separate entity is €500 mln and €250 mln, respectively. Firm T is 100% equity financed. The market value of T as separate entity is €400 mln. The acquisition is financed by an issue of new shares B. The synergy of the acquisition is €100 mln. Because of the acquisition the risk for the debt- holders of B will decrease. As a result the market value of debt increases from €250 mln to €260 mln.

Question: The market value of the equity of B directly after the acquisition of T is closest to

a. €850 mln
b. €890 mln
c. €900 mln
d. €990 mln

See the next pages for **Part B: Open questions**.

Part B: Open questions (18 points)

17. (6 points)
General Activities N.V. consists of three different divisions:

Division	Percentage of the value of the firm
Food	50
Electronics	30
Chemicals	20

General Activities has identified three different competitors (matching or similar firms) to estimate the cost of capital of each of its divisions. The compititors are Tjumbo Foods, MJ Electronics and MarMar Chemicals. In the table below you find the beta of the equity of each of the competitors as well as the proportion market value equity (E) to the sum of E and the market value of the debt (D). Assume a risk-free interest rate of 1,00% and a market risk premium of 6,00%. Ignore taxes.

	Beta Equity	E/(E+D)
Tjumbo Foods	0,8	0,6
MJ Electronics	1,4	0,8
MarMar Chemicals	1,2	0,5

Assume the beta of the debt of each competitor is zero.

Questions:

a. Determine the cost of capital of the division electronics of General Activities. Show your calculation.

b. In what way will the computed cost of capital of division Electronics change if one assumes that the debt beta of MJ Electronics is 0,2? Show a calculation to motivate your answer.

18. (6 points)
Consider a world in which the assumptions of the CAPM hold. The following information about the capital market of the United Islands is given: the risk-free rate is 2,00%, the expected return of the market portfolio is 8,00% and the standard deviation of its return is 25,00%. The standard deviation of the return of security Coogle that is traded on this market is 35,00%. The correlation coefficient of the return of Coogle and the return of the market portfolio is 0,40.

Questions:

a. Determine the beta (β) of security Coogle. Show your calculation.

b. Determine the non-systematic risk of security Coogle in terms of the standard deviation of its return. Show your calculation.

19. (6 points)
Orange Tree Breweries N.V. considers to launch the product "Palmos Light". The product will first be pre-launched during an experimental phase of two years on the Belgian market. This will lead to an initial cash outflow of €400.000. This phase will not generate any cash flow, but it will reveal consumer preferences. Thus, in the first two years there are no cash flows other than the initial investment.

The probability that product demand will be high enough to operationalise geographical expansion is 70 percent. In this case Orange Tree Breweries will spend €10 million immediately after the 2nd year (i.e. t = 2) to launch the product in Germany and France. Then this project will generate annual cash flows of €1,5 mln in perpetuity. If the demand would not appear to be high enough, "Palmos Light" will be withdrawn from the market after the experimental phase. The cash flow after t = 2 then is zero.

During the first two years the level of risk of the project is high. Once the consumer preferences are known, the level of risk will be substantially lower. The CFO of Orange Tree Breweries assumes the required return in year 1 and 2 is 25% and starting year 3 – if the project is a success – 10% on an annual basis.

Question: Calculate the net present value of the project. Show your calculations.