School of Business and Economics

Exam:	Finance (Midterm test 2)	Version A
Code:	E_IBA2_FIN	
Examinator:	Dr. M.B.J. Schauten	
Co-reader:	Prof. Dr. M.J. van den Assem	
Date:	26 November 2019	
Time:	9:00 – 10:30 hrs	
Duration:	1,5 hours	
Calculator allowed:	Yes	
Graphical calculator allowed:	No	
Number of questions:	16	
Type of questions:	multiple choice	
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. Numbers are written in European (Dutch) format with decimal commas, and dots 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:	To determine the score we take into account the expected number of correct answers when answers are given randomly. Number of points = (number of correctly answered questions – 4) × 7,5. The final grade for this exam is: [number of points + 10] / 10.	
Grades:	The grades will be made public at the latest on 10 December 2019.	
Number of pages:	8 (including front page)	

Name : _____

Student number : _____

1.
In Chapter 6 of their book, Berk & DeMarzo explain the difference between the so-called *dirty price* (or "cash price" or "invoice price") and the so-called *clean price* of a bond.

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

a. The *clean price* equals the *dirty price* minus the coupon rate.
b. The *clean price* equals the *dirty price* minus the accrued interest.
c. The *clean price* equals the *dirty price* plus the coupon rate.
d. The *clean price* equals the *dirty price* plus the accrued interest.

2.
Assume an efficient capital market. Bond AAA is a zero-coupon bond and has no default risk. The nominal value of bond AAA is €1.000. The maturity of this bond is 3 years. The 1-year spot rate (r_1) is 5,0%, the 2-year spot rate (r_2) is 4,0%, and the 3-year spot rate (r_3) is 3,0%.

Question: The yield of bond AAA is closest to

a. 0%
b. 3%
c. 4%
d. 5%

3.
Assume an efficient capital market. Consider three bonds in this world. Bond A has a coupon of 2,0%, bond B of 4,0% and bond C of 0,0%. The maturity of each bond is 7 years. The bonds are bullets and have no default risk. The nominal value of each bond is €1.000. The term structure of interest rates shows an increasing pattern, where the 1-year spot rate (r_1) is 2,00% and the 2-year spot rate (r_2) is 3,00%. The price of bond A is €882,02 and the price of bond B is €1.004,12.

Question: The price of bond C is closest to

a. € 759,92
b. € 779,92
c. € 841,27
d. € 870,56

4.
Assume an efficient capital market. Consider two bonds in this world. Bond A has a coupon of 2,0%. The coupon of bond B is 4,0%. The remaining maturity of bond A is 1 year and that of B is 2 years. The bonds are bullets and have no default risk. The nominal value of both bonds is €1.000. The price of bond A is €1.000. The price of bond B is €970,85.

Question: The 1-year forward rate of year 2 ($_1f_2$) is closest to

a. 3,5%
b. 3,9%
c. 5,0%
d. 5,9%

5.
The price-earnings (P_0/EPS_1) ratio is a popular metric among investors to compare the valuation of the shares of different companies.

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

a. A high price-earnings ratio often indicates high growth perspectives and/or high risk.
b. A high price-earnings ratio often indicates high growth perspectives and/or low risk.
c. A high price-earnings ratio often indicates low growth perspectives and/or high risk.
d. A high price-earnings ratio often indicates low growth perspectives and/or low risk.

6.
In Chapter 6 of their book, Berk & DeMarzo explain, among other things, the concept of *short selling*.

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

a. An investor who sells short a stock first receives the current share price.
b. In practice, a short sale typically reflects a desire of the investor to bet against the stock.
c. To short sell a stock, the investor needs to borrow it from someone who currently owns it.
d. While an investor's short position remains open, she receives any dividends made.

7.
Assume a perfect capital market under certainty. Company Marmar growths perpetually at a fixed percentage per year. Every year, 40 percent of the earnings is being paid out as dividend, and this dividend policy will remain unchanged. The required return is 8,0% per year. The share price of Marmar at t = 0 and at t = 1, just after the payment of the dividend, is €100 and €104, respectively (that is: P_{ex} at t=0 is €100, and P_{ex} at t=1 is €104).

Question: The expected earnings per share (EPS) at t = 1 are closest to

a. € 4
b. €10
c €12
d. €14

8.
Assume a perfect capital market under certainty. For firm A and B, the following data is given:

	A	B
Earnings per share at t = 1 (EPS_1)	€ 2	?
Dividend payout ratio	25%	25%
Annual growth rate (g)	4,0%	5,0%

For both firms the discount rate is 10,0%. Assume that the payout ratio and growth rate of both firms remain constant over time. Also, just after the payment of dividend at t=3, the prices of shares A and B are identical (that is: at t=3 it holds that $P_{ex,A} = P_{ex,B}$).

Question: The earnings per share of B at t=1 are closest to

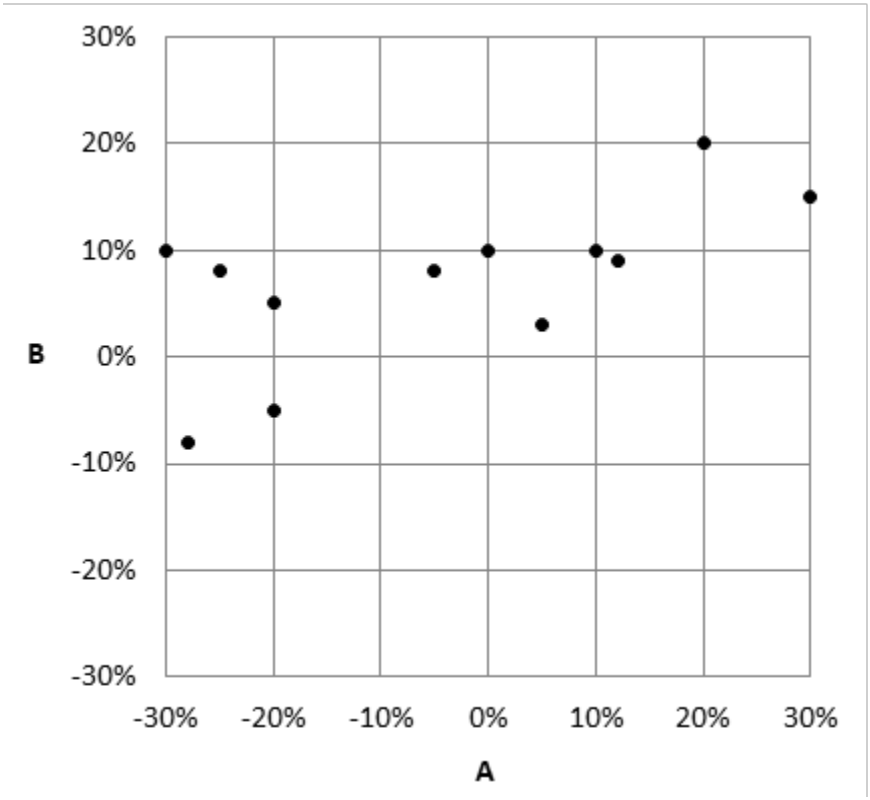
a. € 1,46
b. € 1,53
c € 1,62
d. € 2,16

9.
Consider a world in which the assumptions of the portfolio theory hold.

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

a. The expected return of a portfolio of securities does not depend on the correlations between the securities it is composed of (*ceteris paribus*).
b. The expected return of a portfolio of securities depends on the variances of the returns of the securities it is composed of (*ceteris paribus*).
c. The standard deviation of the return of a portfolio of securities does not depend on the correlations between the securities it is composed of (*ceteris paribus*).
d. The standard deviation of the return of a portfolio of securities depends on the level of the expected return of a security it is composed of (*ceteris paribus*).

10.
Consider the figure below, which plots twelve historical returns of security A and of security B (as pairs of observations).



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

a. The correlation between the returns of A and B is imperfect.
b. The correlation coefficient between the returns of A and B is negative.
c. The variance of the return of A is higher than that of B.
d. The mean return of B is higher than that of A.

11.
Consider a world in which the assumptions of the portfolio theory hold, with one exception: short-selling is not permitted. In this world, only the two securities A and B are traded. The expected return of A is 5,0%, the standard deviation of the return of A is 30,0%. The expected return of B is 55,0%, the standard deviation of the return of B is 40,0%. The correlation coefficient between the returns of A and B is 0,0.

Question: The standard deviation of the return of a portfolio that consists for one half of A and for the other half of B is closest to

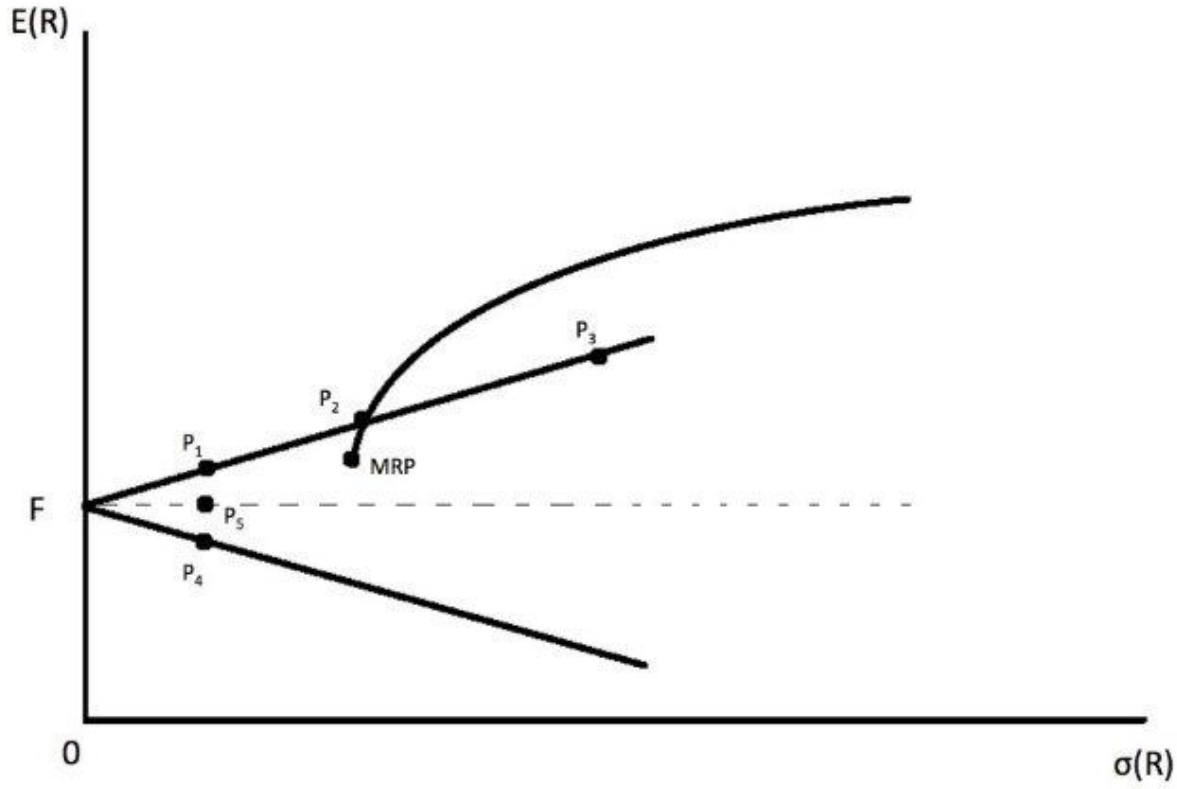
a. 25%
b. 28%
c. 30%
d. 35%

12.
Consider the information provided with the previous question.

Question: The expected return of the minimum risk portfolio is closest to

a. 23%
b. 26%
c. 34%
d. 37%

13.
Consider a world in which the assumptions of the portfolio theory hold. In this world, risk-bearing securities and the risk-free security F are traded. Investors can both lend and borrow at the risk-free return of F. Short selling is allowed. In the figure below, the curve that starts at MRA and runs through P_2 represents the efficient frontier of the risk-bearing securities. MRP is the minimum-risk portfolio of the risk-bearing securities. P_1, P_2, P_3 and F are on the same straight line. P_4 is the mirror image of P_1 relative to the horizontal line through F and P_5.



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

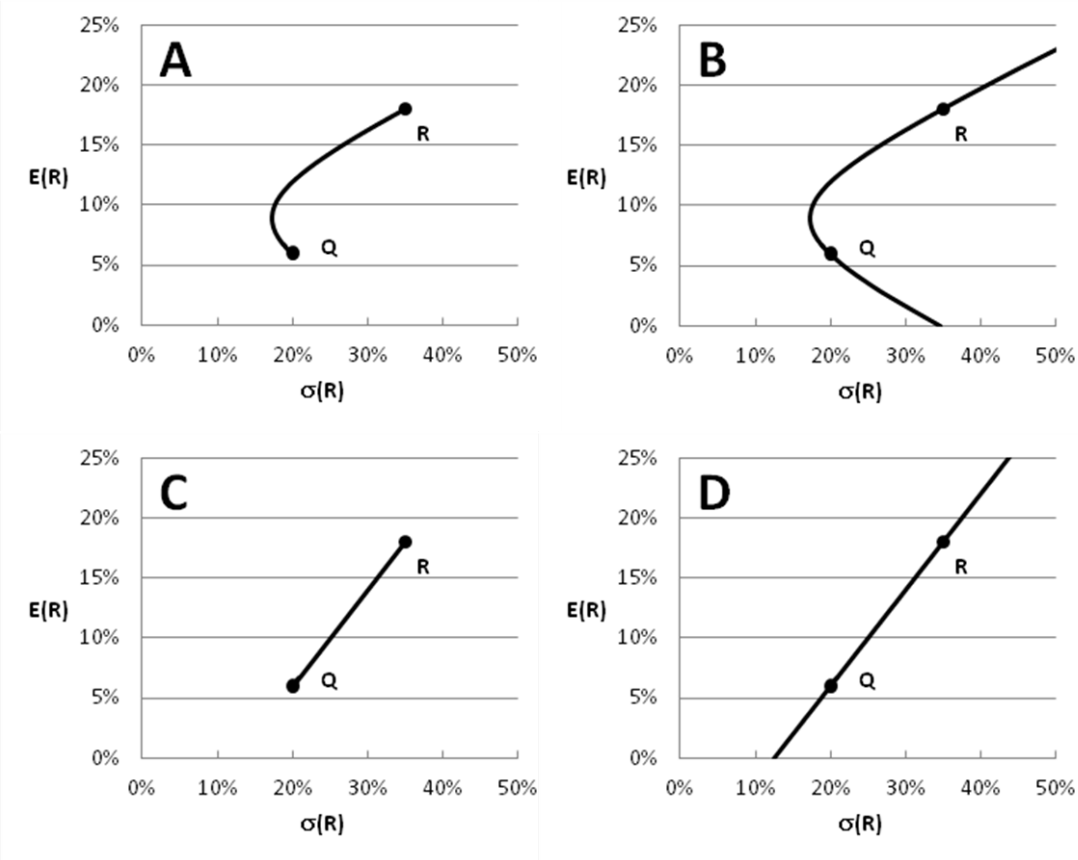
a. Portfolio P_5 can be constructed by combining P_1 and P_4.
b. The Sharpe Ratio of P_1 equals the Sharpe Ratio of P_3.
c. The sum of the Sharpe Ratios of P_2 and P_4 equals 0.
d. The portfolio weights of P_4 satisfy: $x_{P2} < 0$ and $x_F > 1$.

14.
Consider the information and figure provided with the previous question.

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

a. An investor can form portfolio P_3 by combining F and P_2.
b. P_1 can be composed with the same risk-bearing securities as P_2.
c. P_1 can be composed with the same risk-bearing securities as P_3.
d. P_2 is MV-efficient.

15.
Consider a world in which the assumptions of the portfolio theory hold, with one exception: short-selling is not permitted. In this world, only the two risk-bearing securities Q and R are traded. The returns of Q and R are completely uncorrelated. The expected return of Q is 6%, that of R is 18%. R is riskier than Q. One of the four figures below displays the investment opportunities correctly.



Question: Which figure displays the investment opportunities correctly?

a. A
b. B
c. C
d. D

16.
Consider the information provided with the previous question.

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

a. A risk-averse investor will invest exclusively in Q.
b. A risk-neutral investor will invest exclusively in Q.
c. A risk-neutral investor will invest exclusively in R.
d. A risk-neutral investor will invest in both Q and R.

End of test