INTERTEMPORAL CHOICE AND ASSETS

Problem #1
Income of Mr. X is this year given by $m_1 = 1000$. Next year he expects to earn $m_2 = 2000$. The interest rate amounts to 10%. The values consumption in the following way: $U(C_1,C_2) = C_1*C_2$, where C_1 – consumption this year and C_2 – consumption next year.
a)   On the graph relating to intertemporal choice indicate:
-    the present (PV) and future value (FV) of his income stream;
-    his consumption in first the second period (C_1, C_2).
b)   Is Mr. X a lender or a borrower in the first period?
c)   How much does he save (borrow) in the first period?
d)   How much more (less) does he consume in the second period?
e)   Specify the equilibrium conditions (formula).
f)   What is the slope of the budget constraint?
g)   Assume the interest rate increases. Analyze graphically the impact of this change on Mr. X's choice.
-    Will he borrow more or less after the change?
-    Can he become a lender?
-    Is he better or worse off?

Problem #2
The annual income of an Economics student currently amounts to 20 000 *zloty*. Next year he expects to be hired by a world known consulting company, which should increase his income to 90 000 *zloty*. He can borrow money for an average interest rate of 10% *per annum*. Consumption this year costs on average 1 *zloty* per unit and there is no inflation. Since he plans to get married and have kids next year, he values next year's consumption more than this year's and his utility function can be approximated by $U = C_1*C_2^2$, where C_1 and C_2 are consumption in period 1 and 2 respectively. Will he borrow (and if yes how much) this year?

Problem #3
The life of a typical unemployed consists of two periods: the unemployment period (t_1) and the new job period (t_2). During the unemployment period the income of this person typically amounts to 10 000 *zloty*, whereas the new job will bring this person 40 000 *zloty*. On the basis of labor market observation we know that these incomes will change if unemployed persons undergo additional training. Participation in such training costs 2 000 *zloty* during the unemployment period. Income at the new job increases following such training by 5 000 *zloty*. How much will a typical unemployed be willing to spend for training provided that the interest rate between period t_1 and t_2 amounts to 20% (the criterion: compare PV)? Will he decide to undergo such training?

Problem #4
Authorized dealers' sales of new cars have recently decreased. The management board of one of such firms is planning to introduce reductions. Two systems have been proposed:
a)   The reduction of prices of all cars by 10%;
b)   Spreading the payment for a purchased car over the entire year, i.e. at the time of purchase the buyer pays 25% of the car's value and the rest (75% of the car's value) is paid after a year.
At what level of interest rates will it be beneficial for the firm to apply the first system?

Problem #5
Mr. A wants to invest 100 000 *zloty* for 3 years. Below you will find investment offers which he received from his financial consultant. The latter only presented the payment stream generated by each investment. On the basis of such data determine which investment is most beneficial for Mr. A. Calculate the present value of these income streams, as well as their future value.
a) Bank deposit – 5% *per annum* – assume this is an alternative for all other offers, i.e. the interest rate level that will be used to discount the income streams corresponding to the remaining offers.
b) 3-year bonds yielding constant interest of 10%

Years	1	2	3
Income stream	10 000 *zloty*	10 000 *zloty*	110 000 *zloty*

We now invest 100 000 *zloty*. In the first and second year we receive interest. In the third year we obtain interest and reimbursement of the capital we invested.
c) Investment in a service company.

Years	1	2	3
Income stream	0	0	170 000 *zloty*

We now invest 100 000 *zloty*. In the first and second year we receive nothing, in the third year we obtain 170 000 *zloty*.
d) Investment in a computer firm.

Years	1	2	3
Income stream	30 000 *zloty*	30 000 *zloty*	100 000 *zloty*

We now invest 100 000 *zloty*. In the first and second year we earn 30 000 *zloty*, while in the third year we obtain 100 000 *zloty*.

Problem #6
Assume you bought an apartment and you intend to lease it. Its market price currently amounts to 150 000 *zloty*. Every year you will be paid 15 000 *zloty* for the lease. Moreover, every year the price of the apartment increases by 10 000 *zloty*. An alternative investment is purchasing bonds yielding 12.5% *per annum*. After how many years are you going to sell the apartment?