STAT2032/6046:
Financial Mathematics

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Lecture Questions Week 1

Question 1

An investment of \$50 grows to \$150 after 20 years at a simple effective interest rate i. Find i.

a. 20%

b. 15%

c. 10%

d. 7.5%

Answer=??

Question 2

An investment of \$X at time $t_1 = 6$ grows to \$Y at time $t_2 = 19$. The growth in this investment is best described as:

a. $A(0, 19) - A(0, 6)$

b. $A(6, 19) \times A(0, 6)$

c. $\frac{A(19,0)}{A(0,6)}$

d. $A(0, 6) + A(6, 19)$

e. $\frac{A(0,19)}{A(0,6)}$

Answer=??

Question 3

An investor deposits \$10,000 in a bank. During the first year, the bank credits an annual effective interest rate of i. During the second year, the bank credits an annual effective rate of interest $i - 0.05$. At the end of two years, the account balance is \$12,093.75. What would the account balance have been at the end of three years, if the annual effective rate of interest were $i + 0.09$ for each of the three years?

Question 4

Scott wants to have \$800. He may obtain it by promising to pay \$900 at the end of one year; or he may borrow \$1,000 and repay \$1,120 at the end of the year. If he invests any cash inflows at 10% effective per annum for the year, which should he choose?

Question 5

You invest \$1000 now, at a simple interest rate of 6% per annum for ten years. What is the effective rate of interest in the fifth year of your investment?

a. 6.0%

b. 5.4%

c. 4.8%

d. 5.0%

Question 6

Joe deposits 10 today and another 30 in five years into a fund paying **simple** interest of 11% per year. Tina will make the same two deposits, but the 10 will be deposited n years from today and the 30 will be deposited $2n$ years from today. Tina's deposits earn an annual effective **compound** interest rate of 9.15%. In 10 years, the accumulated amount of Tina's deposits equals the accumulated amount of Joe's deposits. Calculate n.

Question 7

Using an effective annual (compound) interest rate of 5%, the present value at $t_1 = 7$, of \$125 due at $t_2 = 10$ is:

a. \$76.74

b. \$107.98

c. \$88.84

d. \$92.59

e. \$108.70

Question 8

An investment pays a monthly effective (compound) rate of interest $j = 1.5\%$. What is the equivalent quarterly effective (compound) rate of interest?

a. 6.00%

b. 6.14%

c. 4.50%

d. 4.57%