ADM 2350N Winter 2019 Quiz #1 solutions – version 1

- You must always keep 6 decimal digits while performing your calculations unless specified otherwise. Rough rounding may lead to zero mark for the question.
- You must show your work!!! You do not have to use formulas – indicating which numbers you enter in a calculator is sufficient to show your work
- All interest rates are assumed to be compounded annually unless stated otherwise

Problem 1: If you invest $1000 for one year at 5% interest rate, how much money will you have next year? Round your answer to the nearest cent.

1050

Problem 2: If you invest $1000 for 4 year at 5% interest rate, how much money will you have at the end of the fourth year? Round your answer to the nearest cent.

1000*1.05^4=$1215.51

Problem 3: How much money you need to invest today at 8% interest rate to accumulate $1000 in 6 years? Round your answer to the nearest cent.

1000/1.08^6=$630.17

Problem 4: If you invest $1000 today, how long will it take to quadruple it (i.e., when your investment will grow to $4000) if interest rate is equal to 6%? Round your answer to the 1/100 of a year.

PV=1000; FV=-4000; i=6; CPT N. Find N=23.79

Problem 5: If you have invested $1000 today and end up with $1800 in 4 years, what is your annual interest rate?

PV=1000; FV=-1800 N=4; CPT I/Y. Find i=15.83%

Problem 6: How much money you must invest today to be able to withdraw $1000 per year for 8 years starting next year if annual interest rate is 7%? Round your answer to the nearest cent.

PMT=1000; i=7; N=8; CPT PV. Find $5,971.30

Problem 7: How much money you must invest today to be able to withdraw $1000 per year forever starting next year if annual interest rate is 4%? Round your answer to the nearest cent.

1000/0.04=$25,000

Problem 8: Repeat Problem 7 assuming you start your withdrawals 6 years from now. Round your answer to the nearest cent.

25000/1.04^5=$20,548.18

Problem 9: You plan to retire in 40 years and you would like to save $1,000,000 by the time you retire. To do so, you plan to set aside a fixed amount of money $C for 40 years starting next year. If annual interest rate is 5%, find C. Round your answer to the nearest cent.

N=40, FV=1,000,000; i=5; CPT PMT. Find $8,278.16

Problem 10: You've just retired and you have $1,000,000 on your saving account that pays 5% annual interest rate. You plan to withdraw $80,000 per year from this account starting next year. For how long your retirement funds will last (i.e., how many withdrawals you'll be able to make)? When solving for the number of years (or the number of withdrawals), you may find that the answer is not an integer number. Please, round your answer to 1/100.

PV=1,000,000; PMT=-80,000, i=5; CPT N. Find N=20.10

Problem 11: Find the PV of an annuity that consists of 15 annual payments of $20,000 per year if the first payment is made immediately (i.e., at t=0) and the interest rate is 7%. Round your answer to the nearest cent.

Set calculator to "beginning" mode
N=15, PMT=20,000; i=7; CPT PV. Find $194,909.36

Problem 12: If the bank offers APR=15% with monthly compounding, how much money will you have on your account one year from now if you invest $100,000 today? Round your answer to the nearest cent.

100000*(1+0.15/12)^12=$116,075.45

Problem 13: Similar to question 12, the bank offers APR=15% with monthly compounding. However, you are able to invest $100,000 for 6 months only. How much money will you have on your account in 6 month? Round your answer to the nearest cent.

100000*(1+0.15/12)^6=$107,736.32

Problem 14: Assume that today you have deposited $10,000 on your saving account that earns you 5% per year. If you will withdraw $5000 five years from now and withdraw another $4000 eight years from now, how much money you will have on your account 12 years from now? Round your answer to the nearest cent.

10000*1.05^12-5000*1.05^7-4000*1.05^4=$6,061.04

Problem 15: You plan to retire in 40 years and you would like to save for your retirement by making annual $5,000 deposits on your saving account that pays you 5% interest rate. You plan to make the first deposit exactly 1 year from now. Unfortunately, because of unexpected financial problems, you were not able to make your 30th deposit (but you made all the remaining 39 deposits). How much money will you have on your account 40 years from now (right after your last deposit?) Round your answer to the nearest cent.

FV of annuity:
N=40, PMT=5,000; i=5; CPT FV. Find FV = 603,998.87

FV of missed payment:
N=10, PV=5,000; i=5; CPT FV. Find FV = 8,144.47

Answer: 603998.87 - 8144.47 = $595,854.40