MBAS 821 Assignment 1 (Due on August 11th at 11:59pm through Course Portal)

1) Aaron has credit card debt of $25,000 that has an APR (monthly compounding) of 15%. Each month Aaron pays the minimum monthly payment only and he is required to pay only the outstanding interest. Aaron has received an offer in the mail for an otherwise identical credit card with an APR (monthly compounding) of 12%. After considering all alternatives, Aaron decides to switch cards, roll over the outstanding balance on the old card into the new card and borrow additional money as well. How much can Aaron borrow today on the new card without changing the minimum monthly payment that he will be required to pay?

2) Assume that the interest rate is 10% per year. Ben is planning to retire in 40 years and hope to live for 25 years in retirement. Ben estimates that in retirement he will need to withdraw $40,000 per year (starting one year after retirement) so that he will just exhaust his savings with the 25th withdrawal. Ben plans to deposit in the bank a constant amount each year starting in one year and retire immediately after making the 40th deposit. What amount will Ben need to deposit in the bank account each year?

3) Smith Industries Ltd. is considering whether or not to invest in a project. The project requires an initial investment of $15,000. It will pay off $34,500 in the first year, but will require a settlement cost of $19,800 in the second year. What is the IRR of the project? At what cost of capital would Smith Industries Ltd. decide to invest in the project?

4) You are deciding between two mutually exclusive investment opportunities. Both require the same initial investment of $9.8 million. Investment A will generate $2.01 million per year (starting at the end of the first year) in perpetuity. Investment B will generate $1.47 million at the end of the first year and its revenues will grow at 2.6% per year for every year after that.

a. Which investment has the higher IRR?

b. Which investment has the higher NPV when the cost of capital is 7.8%?

c. In this case, for what values of the cost of capital does picking the higher IRR give the correct answer as to which investment is the best opportunity?

d. Use the incremental IRR rule to correctly choose between the investments when the cost of capital is 7%. At what cost of capital does your decision change?

5) Pear Inc. is deciding whether or not to invest in a new product in 2020. This investment would require $6 million investment in machinery and will have revenues and cost as follows.

|  |  |  |  |
| --- | --- | --- | --- |
| Year (in thousands of $) | 2021 | 2022 | 2023 |
| Sales | $10,000 | $12,000 | $14,000 |
| Manufacturing Costs | $3,000 | $4,000 | $5,000 |
| Marketing Costs | $2,000 | $0 | $0 |
| Inventory | $1,200 | $1,400 | $0 |
| Account Receivables | $1,000 | $1,200 | $0 |

Pear Inc. uses straight-line depreciation for the machinery and the machines will depreciate over 3 years. The corporate tax rate is 40% and the cost of capital is 7%. What is the NPV of the project?