**Final Exam**

**Corporate Finance**

**NOTE:** The solution should be submitted before 14:00. I will not grade any exam that I receive after 14:00.

**NOTE:** If I suspect cheating in any exam, I will report it to the committee. Be careful.

**NOTE:** Make necessary assumption wherever required.

**Question-1 (10 Points)**

Toll road investments are usually realized through Build-Operate-Transfer (BOT) projects. Since these projects last for a long period of time, they are exposed to various risks. The successful delivery of BOT projects implies that these risks are efficiently mitigated. In order to alleviate project risks, the public partner may offer the private partner the possibility of abandoning the project and transferring it back to the public sector for a specific pre-determined price. In one such project, the public partner offers the private partner the possibility of abandoning the project within 4 years for the salvage value of $80 million. Use one of the binomial option pricing technique to value this option? Assume that the present value of future cash flows from the toll road investment is $100 million and it can go up or down once a year. The volatility is 30% per annum. The risk-free rate is 5%.

**Question-2 (10 Points)**

In many countries, short selling is not allowed. How can you create a trading strategy that will give you a payoff that resembles the payoff of short stock? Assume that you can buy or sell options or stocks in this market. Illustrate your answer.

**Question-3 (5 + 10 = 15 Points)**

OF Corporation invested $100 to buy an equipment 5 years ago. At the time of purchase, the equipment had an expected life of 10 years. If the equipment is not replaced, the company can sell it for $10 at the end of its expected life. However, if it is replaced, the old equipment can be sold today for $40. Assume straight-line depreciation.

A new equipment can be bought for $140, including installation costs. During its 5-year useful life, it will reduce operating expenses by $50 per year. Revenues are not expected to change. At the end of its useful life, the equipment is estimated to be worthless. MACRS depreciation will be used. The equipment will be depreciated over its 3-year class life, rather than its 5-year economic life. Therefore, the applicable depreciation rates are 33%, 45%, 15%, and 7%.

The firm’s tax rate is 30%. What is the initial investment (cash flow at Year 0)? And, what are the incremental net operating cash flows that will occur at the end of Years 1 through 5?

**Question-4 (10 Points)**

OF Corporation has undertaken four loans. All of these loans will mature in six years and can be repaid any time before maturity. The amount of loan remaining along with associated annual interest rate are provided in the following table:

|  |  |  |
| --- | --- | --- |
| **Loans** | **Remaining Balance** | **Annual Interest Rate** |
| A | $25,000 | 6% |
| B | $17,000 | 9% |
| C | $24,000 | 5% |
| D | $15,000 | 7% |

The CFO of the corporation can create a consolidated loan of $81,000 by combining all loans. The bank will charge 7.95% annual interest rate for a period of six years.

Should the CFO create the consolidated loan?

**Question-5 (25 Points)**

Answer the following questions: The answer should not be more than half page.

1. In one of the meetings, the CEO of your organization commented: *“We should not be drilling the oil well because there is a 90% of the chance that we will find a dry well”*. Can this decision represent agency problem? Explain.
2. Consider two equal risk projects (Project-A and Project-B) with equal initial investment. Both projects are expected to last for three years. The Project-A will generate the lowest returns in initial year. The returns of this project will gradually increase and will become the highest in the last year. The Project-B will generate the highest returns in initial year. The returns of this project will gradually decrease and will become the lowest in the last year. Which of the two projects is more desirable? All other things the same for both projects.
3. What is optimal capital structure according to the Pecking Order Theory? Explain.
4. Your boss made the following statement. *“You have to be foolish not to sell a call option on stock you own. You don’t really lose anything because if the stock is called, you own it and just have to give it up. In return, you receive fee income that you get to keep no matter what the buyer of the call option does, it is a no-lose proposition in my opinion.”* Is his view of correct? Explain.
5. In one of the lectures, your professor mentioned that the debt can be used to reduce the agency problems. What was the underlying reason behind his claim?

**Question-6 (10 Points)**

OF Corporation is a technology firm that specializes in contactless delivery products. The CFO has announced that the company is planning to issue new stocks for $33 to finance its new projects. What is OF Corporation’s cost of retained earnings and cost of new common stock?

Assume that its stocks are currently traded at $40 per share. The company is expected to pay a dividend of $4 one year from today. The dividend is expected to grow at a perpetual rate of 5%.

**Question-7 (10 Points)**

OF Corporation (an all-equity financed firm) is contemplating about changing its capital structure. It plans to have 35% debt in the proposed capital structure. Currently, there are 7600 shares outstanding and the price per share is $55. EBIT is expected to remain at $36,000 per year forever. The interest rate on new debt is 8%, and there are no taxes. Which capital structure should Mr. ABC, a shareholder of the firm, prefer? He owns 100 shares of OF Corporation. Assume that dividend payout ratio is 100%.

**Question-8 (10 Points)**

The relationship between capital structure and firm value can be represented as follows: The x-axis represents the proportion of debt in capital structure and y-axis represents firm value. Briefly explain why the impact of capital structure on firm value is negative initially, then it turns positive and finally it becomes negative again.

