Question 1 (6 points) Consider the following statement, state whether it is true or not, and explain why it is true or not. For full marks, be precise and concise and use a graph.

Statement: You are evaluating two projects A and B. You can only choose one of the two projects, but not both. You have the following information on net present values of the two projects.

\[
NPV_A > NPV_B \text{ for cost of capital } k < 8\%
\]
\[
NPV_A < NPV_B \text{ for cost of capital } k > 8\%
\]

You also know that \( IRR_A = 7\% \). Then, both IRR and NPV methods will always yield the same decision.
Question 2 (6 points) Consider the following statement, state whether it is true or not, and explain why it is true or not. For full marks, be precise and concise and use a graph.

Statement: You are evaluating two projects A and B. You can only choose one of the two projects, but not both. You have the following information on the IRRs of the two projects

\[ IRR_A = 10\% \text{ and } IRR_B = 12\% \]

If your cost of capital is 8\%, then in this situation NPV criteria will always pick project B.
Question 3 (6 points) Consider the following statement, state whether it is true or not, and explain why it is true or not. For full marks, show your calculation, be precise and concise.

Statement: You are evaluating a single project A. You have

$$NPV_A = 2,145$$

Your firm is 100% internal equity financed and you use CAPM to calculate your cost of internal equity. Suppose your $$\beta_s = 1.4$$, the risk free rate of return is 2% and $$r_M = 7$$. Then this project’s IRR must be less than 9%.
Question 4 (6 points) Consider the following statement, state whether it is true or not, and explain why it is true or not. For full marks, show your calculation, be precise and use a graph

Statement: You are evaluating two projects A and B. You can only choose one of the two projects, but not both. Let \( k \) denote your cost of capital. You have the following information on the NPVs of the two projects

\[
NPV_A > NPV_B \quad \text{for all } k < 8\%
\]
\[
NPV_A > NPV_B \quad \text{for all } k > 8\%
\]

You also know that \( IRR_A = 9\% \). Then in this situation IRR and NPV criteria will NOT always yield the same decision.
Question 5 (6 points) Consider the following statement, state whether it is true or not, and explain why it is true or not. For full marks, be precise and refer to the MIRR formula on the last page.

Statement: Suppose you are evaluating a two year project using the MIRR criteria. Suppose your cost of capital increases. Then MIRR of this project will increase.
Question 6 (15 points) Consider a company which uses internally generated equity to finance its capital budget. The company uses CAPM to compute its cost of capital and uses IRR method to evaluate projects. The company is considering a 10 year project which requires a date 0 outlay of $67,100 and generates $10,000 in each of the following 10 years. The risk free rate is $r_{RF} = 1\%$ and stock’s beta is $\beta = 2$. What is the highest $r_m$ such that the company should undertake the project according to the IRR method?
Question 7 (15 points) Suppose you are evaluating a two year project using the MIRR criteria. The project will generate a fixed positive cash flow $40,000 for both of the next two years.

Your cost of capital is 12%. For you to accept the project according the MIRR criteria, what should be the maximum intial cost to be incurred today to start the project?
Question 8 (15 points): A company finances its operations with 40 percent debt and 60 percent equity. Its net income is $I = $30$ million and it has a dividend payout ratio of $x = 25\%$. Its capital budget is $B = $30 million this year. The annual yield on the company’s debt is $r_d = 6\%$ and the company’s tax rate is $T = 30\%$.

The company’s common stock trades at $P_0 = $40 per share, and its next expected dividend is $D_1 = $3.2 per share is expected to grow at a constant rate of $g = 5\%$ a year. The flotation cost of external equity is $F = 20\%$ of the dollar amount issued. What is the company’s WACC?
Question 9 (15 points): Suppose you are evaluating a two year project using the MIRR criteria. The MIRR of the project is 12%. The project will generate a fixed positive cash flow $x$ for both of the next two years. The initial cost of the project is $60,000. Your cost of capital is 10%. What is the fixed cash flow $x$ that the project is expected to generate in both of the next two years?
SOME FORMULAS:

• CAPM Equation:
  \[ r_s = r_{RF} + \beta_s(r_M - r_{RF}) \]

• Constant Dividend Growth Stock Valuation
  \[ P_0 = \frac{D_0(1 + g)}{r_s - g} \text{ or } P_0 = \frac{D_1}{r_s - g} \Rightarrow r_s = \frac{D_1}{P_0} + g \]

• Note that the required return on equity (stock) can be computed in two ways.
  \[ r_s = \frac{D_1}{P_0} + g \text{ or } r_s = r_{RF} + \beta_s(r_M - r_{RF}) \]

• Choice between internal and external equity
  If \( w_eB > I(1 - x) \) external equity.
  If \( w_eB < I(1 - x) \) internal equity

• Cost of Internal equity
  \[ r_e^{internal} = \frac{D_1}{P_0} + g \]

• Cost of External equity
  \[ r_e^{external} = \frac{D_1}{P_0(1 - F)} + g \]
  where \( F \) is the floatation cost.

• Weighted Average Cost of Capital
  \[ WACC = w_d r_d (1 - T) + w_e r_e \]
  where cost of equity \( r_e \) depends on whether equity is internal or external.

• Modified IRR in a two year project is defined as
  \[ (1 + MIRR)^2 = \frac{\text{Future Value of Positive Cash Flows}}{\text{Initial Cost}} \]