# **Problems are to be worked in order. Numbers in parentheses are points for each problem. Remember to show any assumptions that you used. All payments occur at the end of the period unless stated otherwise. Interest is compounded annually unless stated otherwise. Face value of all bonds is $1000.**

# **Use a Word document and an Excel spreadsheet.**

1. Cupcake Corp. is considering an investment of $40 million in plant and machinery. This is expected to produce sales of $23 million in year 1, $26 million in year 2, and $30 million in year 3. Subsequent sales are expected to increase by 10% each year for the remaining 2 years. The plant and machinery will be scrapped after 5 years with a salvage value of $10 million. The property and machinery belong to the 3‑year recovery period class for depreciation purposes (MACRS). Cost of goods sold (COGS) is expected to be $8 million in year 1, $14 million in year 2, and to increase at 9% each year for the remaining 3 years. Fixed operating expenses are $1,000,000 per year. Year-end net working capital (NWC) is given below. The corporate tax rate is 40%.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| k = 000s | 0 | 1 | 2 | 3 | 4 | 5 |
| NWC | 500k | 700k | 800k | 800k | 500k | 0 |

1. Calculate the free cash flows for time 0 through time 5.
2. Calculate the net present value (NPV) for a 12% cost of capital.
3. Find the internal rate of return (IRR).
4. Calculate the sensitivity of the investment to a change in the cost of capital (it could be as low as 8% or as high as 16%).
5. Should Cupcake make the investment? Why or why not?

Comments:

* You need to consider the added investment in net working capital (NWC) for each period. The problem gives the total amount of NWC for that period. Cupcake initially invests $500,000 in NWC. At the end of the first year, NWC increases to 600,000 so the firm has increased its investment in NWC by $100,000. This process continues over the project’s life until all of the NWC is returned in last year.

Taxes: The project is part of a larger firm, so any operating losses can be used to offset gains in other areas. This would produce a tax savings for that year