

TO RECEIVE CREDIT YOU MUST CLEARLY SHOW ALL YOUR WORK. YOU MAY NOT JUST LIST THE CALCULATOR BUTTONS YOU PRESSED.

[1] (25 points)

Today, June 11, 2003 you devise an investment plan for yourself. You plan to make 6 equal annual deposits into an account starting on June 11, 2005 and continuing through June 11, 2010. You expect the investment to pay 10% through June 11, 2012 and 12% thereafter. You plan to clean out the account by making four withdrawals: you plan to withdraw an amount equal to twice the original deposit on June 11, 2015, 2016 and 2017 and \$50,000 on June 11, 2018.

Suppose you do everything exactly as you planned until June 11, 2018. On that date, you decide rather than clean out the account, you will immediately begin to make the first withdrawal of a perpetual annuity. **The first withdrawal is on June 11, 2018.**

{a} Find the minimum amount of the original deposits that will work.

{b} Find the amount of the infinite withdrawals. (You can do this part even if you did not get {a}).

{2} (20 points)

You need to borrow \$100,000 and will pay back the loan over a 4 year period. You can choose from three different plans.

Plan A: APR = 10%, compounded annually

Plan B: Quarterly payments of \$7,637.56

Plan C: APR = 9.8%, compounded daily (ignore leap year)

For all three plans clearly indicate the APR, EAR and total payments over the life of the loan.

Which plan do you pick and why?

[3] (25 points)

Bunky's Burgers is contemplating replacement of a piece of equipment and needs your e-financial help. The existing equipment has a book value of \$80,000. It is being depreciated using the straight-line method to a salvage value of \$8,000 over a remaining life of 6 years. Bunky's would realize \$60,000 if it sold the equipment today.

The new equipment would have an expected life of 6 years. Bunky's has a corporate policy of depreciating equipment to a salvage value equal to 10% of its cost using the straight-line method. If the equipment is replaced expected annual sales would rise by \$85,000 and expected annual operating expenses would decline by \$15,000. Additional net working capital of \$8,000 would be required.

Bunky's has a marginal tax rate of 40% and uses the CAPM (aka "Beta") to compute its hurdle rate. Assume a risk-free rate of 5%, a market risk premium of 5% and a beta of 2.

What is the maximum price that Bunky's would be willing to pay for the new equipment if the replacement is to be made?

[4] (30 points)

The Johnston Company is considering purchasing a piece of equipment for \$500,000. While the machine would be depreciated over a life of 10 years to a zero salvage value using straight-line, the firm is unsure as to how long it will actually last. The firm has made the following forecast for the increase in sales minus operating costs for each year:

Probability	$\Delta S - \Delta C$
.30	300,000
.60	500,000
.10	800,000

The firm is not diversified since it operates in only one industry. It has a marginal tax rate of 40%. The new machine would not require any additional net working capital.

Compute the NPV if the actual life of the machine is only 7 years. It could be scrapped at the end of 7 years for \$40,000.

Compute the NPV if the actual life of the machine is 15 years. Scrap value at the end of year 15 is 0.

To adjust for risk of the cash flows **some or all** of this information **may** be helpful:

The risk-free rate of interest is 6%, the project has a Beta of 1.5 and the market's risk premium is 6%. **If** the firm uses the certainty equivalents method, it gets the coefficient for operating cash flows from this table:

σ / CF	0 - .40	.41 - .80	.81 - 1.20	1.21+
α	.8	.6	.5	.4

Assume $\alpha = 1.0$ for any non-operating cash flows.