

Short Answer (15 points each)

1. List one disadvantage of a corporation compared to other forms of business.
2. Based on the attached financial statements and assuming 3M’s accounts receivable days in 2014 was 48 (this was not the actual number), did it take 3M more or less time to collect receivables in 2015 compared to 2014? (Calculations required).
3. Based on the attached financial statements and assuming 3M’s debt-to-capital ratio in 2014 was 0.3 (this was not the actual number), did a larger or smaller percentage of 3M’s capital come from debt in 2015 compared to 2014? (Calculations required).
4. Assume two annuities are identical except that one has higher growth after the initial cash flow, which will have a higher present value?
5. Assume interest rates fall by 3%. The price of which of the following bonds should rise the least?
 - a) bond matures in 5 years and pays no coupons, b) bond matures in 5 years and pays a 2% coupon, c) bond matures in 5 years and pays a 10% coupon, d) bond matures in 10 years and pays no coupons, e) bond matures in 10 years and pays a 2% coupon, f) bond matures in 10 years and pays a 10% coupon.

Problems (75 points each)

Note: Unless I specifically state “calculations required”, you can just set up all problems. Setting up means writing down the appropriate equations and plugging in the correct numbers. Tell me if you are solving for something other than the left-hand side of the equation. If you are using the result of an unsolved equation in a later step, just make that clear. One way to do this is to set up the equation and call your result “A” or “B”, etc. If you prefer, you can solve everything.

1. You have just deposited \$100,000 into an account. Two years and five months from today you would like to make the first of a series of semiannual withdrawals from an account that will grow by 2.5% each. You plan to make your final withdrawal seven years and 11 months from today. The account earns an APR of 3.5% with monthly compounding. Set up the calculations needed to determine how large you can make your first withdrawal.
2. A bond matures for \$1000 two years and seven months from today. The annual coupon rate on the bond (which pays semiannual coupons) is 4%. Set up the calculations needed to determine the clean price of the bond if the yield to maturity on the bond equals 6%.
3. Small Effect Corp is considering investing \$100 million in a new factory that will generate net monthly cash flows beginning four months from today. The first cash flow will equal \$2 million and subsequent cash flows will grow by 5% each through the final cash flow which will occur four years and five months from today. The project’s cost of capital equals 8.5% per year. Set up the calculations needed to determine the annual internal rate of return on the factory.
4. Audiomech trades for \$550 and the Market ETF trades for \$500. The one-year risk-free rate equals 5% and the two-year risk-free rate equals 6%.

<u>State of Economy</u>	<u>Year 1</u>		<u>Year 2</u>	
	<u>Weak</u>	<u>Strong</u>	<u>Weak</u>	<u>Strong</u>
Market ETF	150	200	400	700
AudioMech	100	150	500	800

Identify the trades today (per share of Audiomech) that create an arbitrage profit today. Show also the cash flows created by all trades today and for a weak economy two years from today. And show your total cash flows for a weak economy two years from today. Use a “+” to indicate inflows and “-” to indicate outflows. Calculations required. Note: you don’t have to build the entire table.