Summer 2015: Midterm A Name Key

Note: Problem 5 is on the second page.

Short Answer (15 points each)

1. What is one of the advantages of a corporation compared to other types of firms?

+15 one of: limited liability, no limit on # of owners, access to captal, separation of ownership + mgt.

2. You have calculated that a firm's EBITDA equals $150,000. What does this tell us about a firm?

+15 generates approximately 150,000 of cash from operations

3. Suppose you submit a market order to buy 100 shares of Ford stock. The bid price is $14.51 and the ask price is $14.53. There are hundreds of shares available at both prices. Which price will you end up paying for the stock?

+15 $14.53

4. How does the expected return on a risky bond compare to the yield to maturity on the bond?

+15 lower

5. What is one pitfall of the internal rate of return rule?

+15 one of: delayed investments, multiple IRRs, No IRR, ignores scale, biased against LT projects, problems if differences in risk

Problems (75 points each)

Note: Unless I specifically state "Calculations required", you can just set up all problems and tell me what you are solving for in each step. If you are using the result of an unsolved equation in a later step, just make that clear. One way to do this, set up the equation and call your result "A" or "B", etc. If you prefer, you can solve everything.

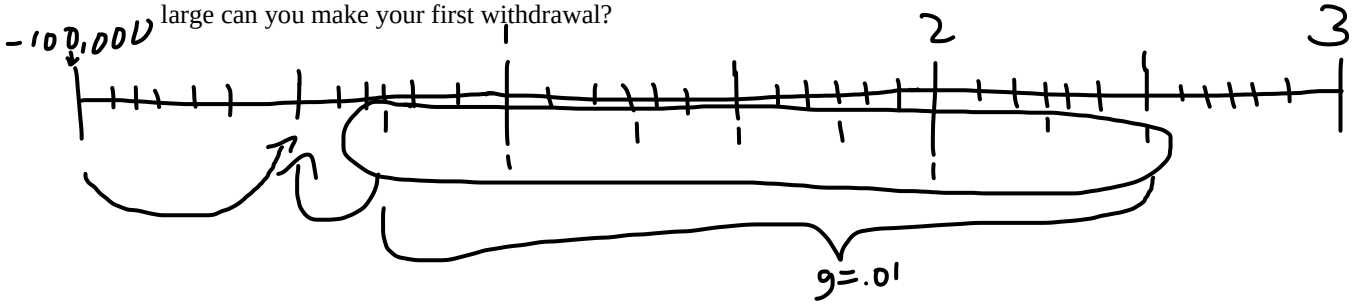
1. Assume that Quick can be bought or sold today for $9 and pays $10 a year from today but nothing two years from today. Slow can be bought or sold today for $25 today and pays nothing a year from today but $30 two years from today. Spread can be bought or sold for $45 today and pays $20 a year from today and $30 two years from today. Set up a table that shows the trades you would make today to earn an arbitrage profit and which shows that no net cash flows occur either a year from today or two years from today. Note: Calculations required.

No arbitrage price of spread: $9(2) + 25 = 43$
$\Rightarrow$ buy spread

Transaction	CF_0	CF_1	CF_2
+8 Short-sell Spread	+45 +5	−20 +5	−30 +5
+8 Buy 2 Quick	−2(9) +5	+2(10) +5	− +5
+8 Buy Slow	−25 +5	− +5	+30 +5
	+2 +5	Ø	Ø

+1

2. You have just deposited $100,000 into an account with an APR of 8% per year. The interest on the account compounds monthly. Nine months from today, you plan to make the first of a series of quarterly withdrawals from the account. After your initial withdrawal, you plan for your quarterly withdrawals to grow by 1% each through the final withdrawal two and a half years from today. How large can you make your first withdrawal?



+7 $V_{6mo} = 100{,}000\left(1+r\left(\frac{1}{12}\right)\right)^6$ +3 −5 +8 (18)

+7 $V_{6mo} = \left(\frac{C}{r\left(\frac{1}{4}\right)-.01}\right)\left(1-\left(\frac{1.01}{1+r\left(\frac{1}{4}\right)}\right)^8\right)$ ✓ +2 +8 (19) −5

set equal + solve for C +4

+7 $r\left(\frac{1}{12}\right) = \frac{.08}{12}$ +4 +8 (19)

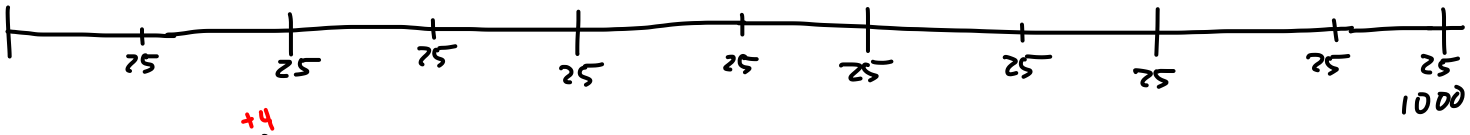
+7 $r\left(\frac{1}{4}\right) = \left(1+r\left(\frac{1}{12}\right)\right)^3 - 1$ +8 −5 (15)

3. Grayson Inc. is considering investing $150,000 in a new project that will generate a net cash flow of $35,000 per year. The first cash flow will occur one year from today and the final cash flow will occur seven years from today. What is the internal rate of return on this project?

$$NPV = -150{,}000 + \frac{35{,}000}{r}\left(1 - \left(\frac{1}{1+r}\right)^{7}\right) = 0$$

$\Rightarrow$ Solve for r

4. Assume a bond matures five years from today for $1000 and that the bond has a 5% coupon rate and semiannual coupons. Assume also that the bond's yield to maturity equals 9% APR.
   a. What is the fair price of this bond today?
   b. Assume that one month from today the bond happens to trade at exactly the price you calculated in part a. What will be the clean price of this bond?



+7 (a. $y(\frac{1}{2}) = \frac{.09}{2} = .045$ (+4, +8)

$V_0 = \frac{25}{.045}\left(1 - \left(\frac{1}{1.045}\right)^{10}\right) + 1000\left(\frac{1}{1.045}\right)^{10}$ (+4, +8, +7, +4, +8, +7)

+7 (b. clean = V_0 (from "a") $- 25(\frac{1}{6})$ (+11)

5. Set up the calculations need to determine unlevered net income and free cash flow for the new facility both today and five years from today. Note: You only need to set up all the appropriate equations and fill in the correct numbers. You don't have to solve anything, but you are welcome to do so if you prefer.

Honda is considering building a new manufacturing facility on land it owns in South Austin. The facility would cost $100 million to build (the cost would be incurred today) and would fall into the ten-year MACRS class. The land was purchased three years ago for $1 million and Honda estimates it could sell the land today for $2 million (after taxes) if it does not build the plant. An environmental impact study shows no adverse effect on wildlife. The $250,000 cost of this completed environmental impact study is due today. Initial sales from the factory will occur one year from today and will equal $90 million. After the first year, sales would rise by 20% per year for the first five years. Fixed selling and administrative costs will equal $10 million per year and variable costs (including cost of goods sold) will equal 45% of sales. Honda's marginal tax rate equals 35%. Finally, the net working capital associated with the new factory today (year 0) and for the following five years are listed below. (in millions)

Year	0	1	2	3	4	5
Cash	0.00	6.45	6.60	6.65	6.55	6.80
Acct. Receive	0.00	6.00	6.15	6.60	7.15	7.55
Inventory	0.00	40.15	41.60	41.00	43.60	46.55
Acct. Payable	0.00	33.45	34.10	35.10	38.00	37.45

$UNI_0 = 0$ +2

+5 ($FCF_0 = UNI_0 + D_0 - CE_0 - \Delta NWC_0 = 0 + 0 - (100+2) - 0$ +2 +5

$CE_0 = 100 + 2$

(-3) if subtract 0.25 for environmental study

+10 ($UNI_5 = (R_5 - E_5 - D_5)(1 - T_c)$

$R_5 = 90(1.2)^4$ +2 +2 +5

$E_5 = 10 + .45(R_5)$ +2 +2

$D_5 = 100(.0922)$ +5 +5

$T_c = .35$ +2

+5 ($FCF_5 = UNI_5 + D_5 - CE_5 - \Delta NWC_5$

+5 ($\Delta NWC_5 = NWC_5 - NWC_4$

$NWC_5 = 6.80 + 7.55 + 46.55 - 37.45$ +2 +2 +2 +2

$NWC_4 = 6.55 + 7.15 + 43.60 - 38.00$ +2 +2 +2 +2