Stanford University **CS 183 – Startup**
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Problem Set 2

Due: Thursday, April 26, 11:59PM
Note: Each student must submit their solutions to the form at http://bit.ly/I0BmpA for grading.
To earn partial credit, please also submit your work to Coursekit in .xls, .pdf, .doc, or .docx format
Round to the nearest number, omit commas and dollar signs, and express percentages as "0.XX"

For all problems, please make the following assumptions:

1. There are at most six claimants to the equity of a startup at its earliest periods:
    a. the founders
    b. the early employees and advisors ("early employees")
    c. a single angel investor
    d. a single, different Series A investor, and
    e. the option pool for post-Series A employers
    f. a single Series B investor (in one problem only)
2. Early employees, have either restricted stock or incentive stock options ("ISOs")
3. A rule-of-thumb is that the fair market value of restricted stock or ISOs is can be set at 10% of fair market value of the price per share of the preferred in a given funding round. Assume that:
    a. early employee stock prices off the angel round
    b. the Series A option pool prices off the Series A round
4. Angel notes always convert into Series A preferred
5. All interest is non-compounding (e.g., at a 12% interest rate, interest is paid 1% per month, totaling 24% for 2 years).

Problem 1

"Startup A" closed its Series A round at a post-money valuation of $7 million and a pre-money valuation of $5 million.

The option pool share count is set at 20% of the Series A pre-money share count and is created (added) after the Series A.

The angel investor invested $800,000 at a 20% discount, no interest, no cap.

The founder owns twice as many shares as the early employees.

Assume any Series A price per share you would like (a missing, unneeded variable for the questions below)

Questions

a. What amount did the Series A investor invest in Startup A?

b. What is the value of the shares owned by the founder and early employees after Series A? Assume they are holding common shares, with a value of 10% of the preferred share FMV.

c. What is the ratio between the number of shares held by the angel investor and the number of shares held in the option pool? Assume the angel shares have already converted. (please express as a number with 2 decimal places, i.e. "0.XX")

d. What fraction of the company does the founder now own after Series A?
(please express as a number with 2 decimal places, i.e. "0.XX")

Problem 2

"Startup B" closes a $4mm Series A round with a pre-money valuation of $9.5mm.

The option pool value is set at 15% of the Series A pre-money valuation. The options granted immediately after the close of the Series A have an exercise price of $4.00, set at fair market value.

The early employees own 500,000 shares.

The angel round was a $909,090.91 convertible note with a 12% interest rate and a 20% discount that closed 10 months before the Series A.

Questions

a. What is the Series A post-money valuation for Startup B?

b. How many shares are in the option pool?

c. How many shares does the angel investor own at the moment the Series A closes?

d. What is the value of the shares owned by the early employees after the Series A?

Problem 3

"Startup C" had an angel investor invest $800,000 at a 20% discount to the next round, with 0% interest. The angel investor shares convert into common stock in this example.

The Series A round of $5,000,000 was priced at $.50 per share, closing 12 months after the angel round.

The post-money valuation was **$20** million.

The two founders own 10,000,000 shares each.

Immediately after Series A, early employees have shares worth **10.25%** of the post-money valuation.

The Series A option pool value was set at **13%** of the Series A pre-money valuation. All of these options have been issued.

Six months later, Startup C accepts and closes a $25,000,000 cash buyout offer from a large company.

The Series A investor's liquidation terms are a 3x liquidation preference, participating, with no cap.

Questions

a. What was the pre-money value of the Series A deal?

b. How many shares did the angel convert into?

c. What is the total payout to the Series A investors?

d. What is the total payout to the founders?

e. If the offer instead closed at $60,000,000 what would be the total payout to the founders?

Problem 4

The Series A investors in Startup D receive a broad-based weighted average anti-dilution provision.

Series A investors have invested $4mm for 3 mm shares of Startup D.

The angel investor in Startup D owns 500,000 shares.

The two founders own 5,000,000 shares collectively, pre-Series A employees 1,000,000 shares (all I.S.O.), and there is an option pool with 1,500,000 shares. There are no other contracts, rights or securities convertible into stock in Startup D.

At the next round of funding, Series B invests $3 million for 6mm shares.

Questions

a. How many shares of common stock outstanding (CSO) are there immediately prior to the Series B round?

b. How many shares would the Series B amount invested purchase, if converted at the Series A price?

c. What is the new conversion price (NCP) for the preferred shares?

d. How many shares do the original Series A investors control after the Series B round closes?

e. To the nearest 1%, what percentage of the company does each founder then own? Assume each founder owns an equal number of shares.
(please express as a number with 2 decimal places, i.e. "0.XX")

Problem 5

Assume the following combined federal and state tax rates:

ordinary income and short term capital gains:	40%
alternative minimum tax ("AMT"):	25%
long-term capital gains (held over 12 months):	20%

Employees X and Y are issued equity in "Startup E" at the same time, at the start of year 0.

Employee X is issued 10,000 shares of restricted stock with price at FMV, and elects 83(b).

Employee Y is issued 10,000 incentive stock options (I.S.O.) with exercise price at FMV.

The fair market value of ("FMV ") at issue was $0.10.

Assume both X and Y are subject to AMT in all years, and have four-year vesting with a one-year cliff.

The FMV's of Startup E in all years is:

Year	**0**	**1**	**2**	**3**	**4**	**5**
FMV	**$0.10**	**$1.50**	**$3.50**	**$4.00**	**$20.00**	**$60.00**

Y exercises all vested stock in year 3 and sells 35% of this exercised stock, partially to pay AMT.

The company does an I.P.O. at the end of year 4.

In year 5, both X and Y sell all their remaining equity in the company.

Assume Y has 100% AMT recovery in year 5.

Questions

a. What is the total value of sales proceeds minus taxes, as realized by X? (assume discount rate of 0%)

b. What is the total value of sales proceeds minus taxes, as realized by Y? (assume discount rate of 0%)