##This file contains only technical questions. There are 3 levels of difficulty Indicated by the headings level 1, level 2, and level 3. Each level contains one or more categories of questions. These include general, accounting , DCF, trading and transaction, LBO, M&A, Restructuring, and Debt. Each of those categories contains one or more numbered questions It also includes the answer that also includes the answer.##

Level 1:

General:

1. **What is investment banking/what do investment banks do?**
    - Investment banks can provide advisory services (M&A and RX) and raise capital for clients through the equity and debt capital markets.

2. **Tell me about something in the news recently that you read that relates to finance?**
    - Regularly read the WSJ. It is typically easy to do one about the economy. Ex: unemployment, some Fed action, etc.

3. **A CEO comes to you and says she/he has extra cash on their balance sheet. What can they do with it?**
    - Dividend
    - Share buybacks
    - Debt paydown
    - Organic growth (capex)
    - Inorganic growth (M&A)

4. **Two companies: A&B. First year EV/EBITDA multiple for both A&B is 10.0x. Year 2 for A is 9.0x, Year 2 for B is 5.0x. Which company has higher EBITDA growth?**
    - Assuming EV stays the same B will have higher growth. Using dummy numbers, 100 EV, both companies in year 1 have 10 EBITDA. A in year 2 has 11.11 EBITDA and B has 20 EBITDA.

5. **What is the market cap for a company that has... $2bn in assets 3x Debt to Equity 2x P / BV...**
    - 1bn A = L + SE If A = 2bn, we know L + SE = 2bn since A = L + SE. Thus, since Debt is 3x Equity, we know that Liabilities are 1.5bn and Equity is .5bn or 500mm (add up to 2bn). BV (Book Value) is essentially shareholder's equity, and since the P / BV is 2x, we know that the market cap of the company is 1bn (2 * 500mm).

Accounting:

6. **What are the three financial statements and what do they mean?**
    - Income statement: shows performance of a business over a period of time.
    - Balance sheet: shows snapshot of business' assets and liabilities at one point in time.
    - Cash flow: reconciles the difference between accrual accounting and cash accounting.

7. **How are the three statements linked?**
    - Net income flows into both retained earnings and the top of the cash flow statement which flows into the balance sheet through overall change in cash. Non-cash expenses appear on the income statement and cash flow statement. Several more etc.

8. **When do you decide between capitalizing an expense and just normally expensing an item?**
    - You capitalize an expense when you purchase an asset that you believe is going to be used for longer than at least 1 year.
        - Ex: Purchasing a machine that will be used in your factory for many years is a capital expenditure, while purchasing inventory that you plan to sell soon is a normal expense.

9. **If you were only allowed one financial statement for analysis, which one would you choose?**
    - Cash flow statement because the cash flows give a true representation of the business.

10. **Where does interest expense occur on the cash flow statement?**
    - It doesn't, it appears on the income statement.

11. **How do non-cash expenses affect the cash balance?**
    - They have a net positive affect on the cash balance because they provide a tax shield and are fully added back on the cash flow statement.

12. **How does a $10 increase in depreciation affect the three financial statements**

<table>
<tr><td>Income Statement</td><td>Cash Flow</td><td>Balance Sheet</td></tr>
<tr><td>Depreciation = -10</td><td rowspan="2">Net Income = -8
Non-Cash gain = +10</td><td>Change in Cash = +2
PP&E = -10</td></tr>
<tr><td>Pre-tax income = -10
Taxes @ 20% = +2</td><td>Total Assets = -8</td></tr>
<tr><td>Net Income = -8</td><td>Change in Cash = +2</td><td>Net Income = -8</td></tr>
<tr><td></td><td></td><td>Total L and SE = -8</td></tr>
</table>

13. **How can you tell whether or not an item should appear on the cash flow statement?**
    - It has already been on the income statement and affected net income but is non-cash
    - It has not appeared on the income statement and does affect the company's cash balance.

14. What is the formula for working capital?

- NWC = current assets – current liabilities. When modeling, you exclude cash, investments and debt from the change in working capital calculation.

15. What is a leverage ratio?

- Total debt / EBITDA. A common metric to express how much debt a company has relative to its ability to pay it back.

16. Walk me through the cash flow statement.

- The cash flow statement is broken up into three sections: Operating, Investing, and Financing. In the Operating section you begin with net income, add back non-cash expenses, and assess for changes in working capital. In the Investing section, you have capital expenditures, fixed-asset sales, and changes in long-term investments. In the financing section, you have issuance/repayment of debt, issuance/repurchase of equity, and dividends.

17. Walk me through the income statement.

Revenue - Cost of Goods Sold - Operating Expenses
EBIT - Interest - Taxes
Net Income

18. Is goodwill depreciated?

- Not anymore. It is tested once a year for impairment.

19. What is a stock purchase and what is an asset purchase?

- A stock purchase refers to the purchase of an entire company so that all the outstanding stock is transferred to the buyer. Effectively, the buyer takes the seller's place as the owner of the business and will assume all assets and liabilities. In an asset deal, the seller retains ownership of the stock while the buyer uses a new or different entity to assume ownership over specified assets.

20. What is FIFO and what is LIFO?

- FIFO: First in first out. Calculates expenses by recognizing the oldest inventory in stock as the one associated with the sale.
- LIFO: Last in first out. Calculates expenses by recognizing the most recently acquired inventory in stock as the one associated with the sale.

21. Could you end up with negative shareholder's equity and why?

- Yes. Could be caused by either a dividend recap or continuous losses.
- Issuing a dividend has a negative impact on equity value.

22. A machine costs $10 to buy and has a life of 10 years. At the end of the fifth year the machine breaks and you get rid of it. Walk me through the three financial statements.

<table>
<tr><td>Income Statement</td><td>Cash Flow</td><td>Balance Sheet</td></tr>
<tr><td>Loss on fixed asset = -5</td><td rowspan="2">Net Income = --4
Non-Cash exp. = +5</td><td>Change in Cash = +1
PP&E = -5</td></tr>
<tr><td>Pre-tax income = -5
Taxes @ 20% = +1</td><td>Total Assets = --4</td></tr>
<tr><td>Net Income = -4</td><td>Change in Cash = +1</td><td>Net Income = --4</td></tr>
<tr><td></td><td></td><td>Total L and SE = -4</td></tr>
</table>

23. Say you knew a company's net income. What else would you need to figure out its cash flows?

- D&A, other non-cash expenses (e.g. stock based compensation, impairment), changes in working capital accounts, capex, sale of PPE, debt issuance, debt repayments, equity issuance, stock repurchases, dividends

Valuation:

24. What are the four main valuation methodologies and where would they fall in a football field?

- DCF
- Trading comps
- Precedent transactions: typically, the highest because it incorporates control premium and synergies.
- LBO: typically, the lowest because valuation is determined by hurdle rate. Financial sponsors are usually the most price sensitive.

25. How do you calculate enterprise value?

<table>
<tr><td>Equity value
+ Debt
- Cash
+ Minority interest
+ Preferred stock</td></tr>
<tr><td>Enterprise value</td></tr>
</table>

26. Is equity value/EBITDA an acceptable multiple and why?

- Both equity and debt investors have rights to EBITDA. Every income statement metric EBIT and above, you have to use EV, for everything below you use equity value.

27. You have a business with two segments. One of them is high margin and low growth and the other is low margin and high growth. How would you value this company?

- Sum of the parts.

28. If a company issues $100 million in debt and doesn't spend any of it, how does that affect enterprise value?

- Enterprise value doesn't change because you would add $100 million and then it's still in cash so you would subtract it.

DCF:

29. How do you forecast revenue for a company?

- You can project quantity sold and multiply it by average unit sale price.

30. Walk me through a DCF

- There are 2 main stages in a DCF.
  - In stage 1, you project free cash flow for 5 – 10 years, discount all the cash flows back to the present and sum them together.
  - In stage 2, you assess a terminal value for the business, discount that terminal value back to the present.
- The sum of the present value of those 2 stages will give you an enterprise value for the business.

31. How do you calculate unlevered free cash flow?

EBIT
- Taxes
+ Non-cash expenses (D&A)
- Capital expenditures
- Increases in net working capital
Unlevered free cash flow

32. How do you calculate cost of equity?

- Cost of equity = risk free rate + beta * equity market risk premium.
  - Risk free rate: typically, 10yr yield of government debt.
  - Beta: Get from Bloomberg or FactSet. Measures systematic risk. Regression to a local stock index.
  - Equity market risk premium: Get from a valuation firm such as Duff & Phelps.

33. How do you calculate cost of debt?

- Weighted average yield on the debt outstanding, if the company has public debt. If the company does not have public debt, you can assume a credit

rating and use a yield spread between US treasuries and debt of that credit rating to arrive at an implied cost of debt.

34. How do you calculate cost of preferred equity?

- Dividend yield.

35. How do you calculate WACC?

- % of equity * cost of equity + % of preferred stock * cost of preferred stock + % of debt * cost of debt * (1-tax rate).

36. Why is debt typically the cheapest form of capital?

- Because interest is tax deductible.

37. What are the two ways that you can calculate terminal value?

- Perpetuity growth approach: You apply Gordon growth formula to your last year of free cash flow in stage 1. Then discount that value back to the present.
- Exit multiple approach: Assuming EV/EBITDA multiple, you would get the last year of projected EBITDA in stage 1, multiple it by your EV/EBITDA multiple and then discount that value back to the present.

38. How does change in working capital affect free cash flow?

- Increase in working capital is a use of cash and decreases free cash flow.

39. What does beta mean?

- Unlevered beta measures systematic business risk. Levered beta measures systematic business risk and accounts for the company's leverage.

40. How do you pick a long-term growth rate when using the perpetuity approach to terminal value?

- You would usually pick a number that is near inflation. You do not want to pick a number higher than the average GDP growth rate of that country.

41. How do you calculate diluted shares outstanding?

- You would use the treasury stock method. In the treasury stock method, you recognize all exercisable options outstanding and assume that you would use the proceeds from those options to buy back shares and reduce the net dilutive effect.

42. Does an increase in depreciation have a net positive or negative impact on FCF?

- Net positive because decreases taxes and fully added back.

43. Which assumptions have the biggest impact on a DCF?

- Discount rate and terminal value.

44. You have 3 different scenarios below. Which one has the most positive impact on FCF and which one would produce the highest TV using exit multiple method? Revenue increases by $10. D&A decreases by $10. Capex decreases by $10.

- Revenue increases by $10:
  - FCF: Increases FCF, but there are additional variable costs, so it increases FCF by a number less than 10.
  - Exit multiple: This one produces highest TV with exit multiple. EBTIDA will increase, but not by a full $10.
- D&A decreases by $10:
  - FCF: When D&A increases it has a net positive impact on FCF, so in this example FCF goes down.
  - Exit multiple: D&A is not in EBITDA and has no effect.
- Capex decreases by $10:
  - FCF: This one has most positive impact on FCF. FCF increases by a full 10 because capex decreasing gives you a 1:1 impact.
  - Exit multiple: Capex is not included and EBITDA and has no effect.

45. How would you value the TV of an oil and gas or forestry or mining business?

- You would use exit multiple because it wouldn't make sense to do Gordon growth because the assets are not growing into perpetuity

46. What is the Beta of a gambling ring?

- 0 - no correlation to market

Trading and Transaction Comparables:

47. What are some important characteristics you look at when screening for comparable companies and precedent transactions?

- Geography
- Industry
- Size
- Time (precedent transactions)

48. If the company you are valuing has a negative EBITDA, how could you do trading comparables or transaction comparables?

- You could use a different multiple such as EV/Revenue. Revenue is almost always positive.

49. Where can you find comparable companies (in the real world)?

- List of competitors in the 10K.
- In the latest proxy there will be a section regarding management compensation and within that there is a list of comparable companies.
- Publicly filed fairness opinions.

50. Where can you find precedent transactions (in the real world)?

- Publicly filed fairness opinions.
- Databases such as Factset and CAPIQ.

51. Almost identical companies, but one trades at a higher multiple. How could this happen?

- Competitive advantage
- Could be in a strategic process (M&A) and believed to be acquired soon at a premium.
- Higher market share
- Good / bad recent news

LBO:

52. How is an LBO different from a DCF valuation?

- An LBO sets a target IRR as the independent variable and the price of the company as the dependent variable. "Back into" a purchase price given a desired IRR.
- In a DCF you are just discounting forecasted FCF back to the present.

53. Walk me through a basic LBO.

- First you make assumptions on your sources and uses, including purchase price and consideration. Make adjustments to the target's balance sheet for the new debt and equity and allocate purchase price to goodwill etc. Then forecast the financial statements for ~5-year period and calculate debt paydown. Finally, make assumptions about the exit and compare the initial equity investment to the proceeds.

54. What are possible exit strategies for an LBO

- M&A deal: sell the company to a strategic or another financial buyer.
- IPO
- Dividend recapitalization: if there is no ability to sell or IPO, then you could repetitively dividend recap to slowly earn a return.

55. What are the three main value drivers in an LBO?

- Multiple expansion, EBITDA growth, Debt paydown

56. In an LBO, would you prefer an additional dollar of EBITDA or an additional dollar of debt paydown?

- You would prefer EBITDA because a % of it would go towards debt paydown and there is also value from an EBITDA multiple valuation.

M&A:

57. Why would one company buy another company?

- The asking price is less than the implied value of the business. You are getting a bargain.
- The buyer's expected IRR from the acquisition exceeds its WACC.

58. Walk me through the income statement in a merger model and discuss what factors affect an accretion dilution analysis in a merger/acquisition?

- Synergies, additional D&A expense because of write ups, additional interest expense if financed with debt, share count change if financed with stock

59. Walk me through a merger model.

- You estimate purchase price and consideration. Create a sources and uses table and purchase price allocation schedule to estimate the cost of the acquisition. Combine the balance sheets, reflecting new cash, debt, equity and goodwill accounts. Combine income statements while accounting for new synergies, interest expense, D&A, and forgone interest on previously held cash. Calculate new EPS and compare to before the proposed acquisition.

60. Company A with a P/E of 10x acquires company B with a P/E of 8x, if this transaction is all stock is it accretive or dilutive?

- Accretive because 8x is less than 10x. When it is an all stock deal, you can simply compare the P/E's. If the target has a lower P/E than the acquirer, the deal is accretive. If the target has a higher P/E, then it is dilutive.

61. Why do you focus on EPS in M&A deals?

- It is the only easy to calculate metric that captures the full impact of a deal.

62. How can you calculate shorthand ROIC from a transaction?

- UFCF, or EBITDA or EBIT / Purchase price

63. Under what circumstances would $100M in revenue synergies be a straight addition to the pro forma company's EBITDA?

- The synergies would be a full $100M if they were driven by a price increase and not additional unit sales. The logic here is that if you are only increasing the pricing of previous products, you will not generate any additional COGS. This could be possible if an acquisition improved your pricing power or competitive positioning in the market. It is also possible that a service or software company may be able to convert 100% of the revenue synergies into EBITDA even with higher unit sales, though less likely.

Restructuring

64. What options are available to a distressed company that can't meet its debt obligations?

- Refinance
- Sale of the company (As a whole or pieces in an asset sale)
- Restructure (lower debt/interest payments, issue PIK)
- Bankruptcy (Chapter 11)

Debt:

65. What is the difference between a loan and a bond?

- A bond is typically publicly traded, while a loan is not.

66. If a bond is trading at a premium what does that mean?

- It has a high demand in the market and people are willing to pay more for it, therefore it will have a lower yield.

Level 2:

General:

67. A company is considering raising debt to buy back shares. What are some things management should consider? If you were pitching this to the board of the company and only had 2 slides in a deck to do so, what would they say?

- The main thing you want to consider is what net effect this would have on EPS. Additional interest expense will reduce earnings and therefore EPS, but reducing the share count also increases EPS, so it is important to look at the net effect. As well, want to look at company's current debt levels etc.

68. A company with a net income of $100mm and a PE of 15x is considering raising debt to issue a $200mm dividend. If there cost of debt is 10% and their tax rate is 50%, what is the net benefit/expense.

- Interest expense would cause net income to decrease by $10mm ($200mm * (10% * 50%) = $10mm). $10mm * 15x implies an expense of $150mm. $200mm – 150mm = $50mm net benefit.

69. If a company has $10 million in revenue and $5 million in EBITDA, would you rather have 20% increase in units sold, raising unit price by 20% or cutting expenses by 20%?

- You would rather have unit price increase of 20%.
  - Selling 20% more units incurs variable cost and therefore EBITDA increases by less than $2 million
  - Reducing expenses by 20% will only increase EBITDA by $1 million
  - Increasing unit price by 20% will increase EBITDA by a full $2 million

70. You are given the following statistics: tax rate = 25%, P/E = 20x, EV/EBITDA = 7.5x, gross margin = 50%, SG&A (incl. D&A): 500, shares outstanding = 100, revenue = 2,000, debt = 1,000 @ 10%. What is the share price?

- Walk from revenue to net income, find the eps, and then use P/E to find price per share of $60.

Revenue	2,000
Gross profit	1,000
SG&A	(500)
EBIT	500
Interest expense	(100)
EBT	400
Net income	300

71. Revenue is $100; Net income is $10. If the next year revenue is $200, what is net income?

- You do not have enough information to answer the question, you need a better understanding of the fixed vs variable cost structure.

Accounting:

72. You buy PP&E for $100 (5-year life) and finance it with 50% debt and 50% cash on the balance sheet (10% interest rate). Walk me through the three financial statements at the beginning of year 1. Walk me through the three financial statements at the end of year 1. Walk me through the financial statements at the end of year 3 when you sell the asset for $60.

- At the beg of year 1

Income Statement	Cash Flow	Balance Sheet
None	Capex = -100 Issuance of debt = +50	Change in Cash = -50 PP&E = +100
	Change in Cash = -50	Total Assets = +50
		Debt = +50
		Total L and SE = +50

- At the end of year 1

Income Statement	Cash Flow	Balance Sheet
Depreciation = -20 Interest Expense = -5	Net Income = -20 Non-Cash exp. = +20	Change in Cash = 0 PP&E = -20
Pre-tax income = -25 Taxes @ 20% = +5	Change in Cash = 0	Total Assets = -20
		Net Income = -20
Net Income = -20		Total L and SE = -20

- At the end of year 3, just referring to sale, could do debt repayment too if you wanted to

Income Statement	Cash Flow	Balance Sheet
Gain on asset = +20	Net Income = +16	Change in Cash = +56
Pre-tax income = +20 Taxes @ 20% = -4	Non-Cash gain = -20 Sale fixed asset = +60	PP&E = -40 Total Assets = +16
Net Income = +16	Change in Cash = +56	Net Income = +16
		Total L and SE = +16

73. Do you think change in net working capital is usually an outflow or an inflow for retailers?

- It is usually an outflow because they have to buy inventory in advance of selling it.

74. Why do you exclude cash, investments and debt when calculating change in working capital on the cash flow statement?

- You exclude cash because the bottom of the cash flow statement already calculates change in cash therefore if you did include it you would be double counting it
- You exclude change in investments because that is in the investing activities section not the operating section of the cash flow statement
- Debt issuances and repayment are covered in the financing section

75. Give examples of ways that companies can inflate earnings.

- Switching from LIFO to FIFO if it is a rising cost environment.
- Changing depreciation methods
- Capitalizing interest or R&D that should not be capitalized
- Compensating employees with options rather than cash
- Asset sales or one-time items that have positive effect on earnings

76. You have a loan of $100 at a 10% interest rate that is all PIK. What is the balance of the loan at the end of year 2?

- 121. At the end of year 1 the loan balance is 110. 10% of 110 is 11 and therefore 110 + 11 = 121. PIK interest compounds.

77. Walk me through the three financial statements at the end of a year when you have $1,000 debt @ a 10% interest rate with 50% cash and 50% PIK interest.

<table>
<tr><td>Income Statement</td><td>Cash Flow</td><td>Balance Sheet</td></tr>
<tr><td>Interest expense = -100</td><td>Net Income = -80</td><td>Change in Cash = -30</td></tr>
<tr><td>Pre-tax income = -100</td><td>Non-Cash exp. = +50</td><td>Total Assets = -30</td></tr>
<tr><td>Taxes @ 20% = +20</td><td rowspan="3">Change in Cash = -30</td><td>Debt = +50</td></tr>
<tr><td>Net Income = -80</td><td>Net Income = -80</td></tr>
<tr><td></td><td>Total L and SE = -30</td></tr>
</table>

78. What are deferred taxes?

- Deferred taxes are when there is a difference between cash taxes paid and the tax expense shown on the income statement. This can be caused due to differences between financial statement accounting and tax accounting.
- Deferred tax liability –when cash taxes are expected to exceed book taxes. As cash taxes are higher it reduces DTL's, therefore when book taxes are higher it creates DTL's.
- Deferred tax asset – As book taxes are higher it reduces DTA's, therefore when cash taxes are higher it creates DTA's.

Valuation:

79. How is valuing a private company different?

- When calculating cost of capital, you need to add an illiquidity/private company premium. Also, maybe a size premium.

- You don't have a beta, so you take it from the comp set through a process of un-levering and re-levering.
  - You also need to make assumptions about the private company's capital structure which you can get by taking a median of the comp set.
- If the company doesn't have public debt, then you need to assume a credit rating on the company and arrive at a cost of debt by looking at the spread between credit ratings and the risk-free rate.
- Discount multiples from trading comps.

80. If a company issues a $100 dividend using cash on its balance sheet, how does that affect its enterprise value?

- There is no change because 100 cash is gone, which increases EV and then a 100 dividend reduces equity and brings EV back to its previous value

81. A company is currently trading at a 10x EV/EBITDA multiple. The company sells an asset for 2x the asset's EBITDA. Will the sale increase or decrease the company's EV and how will it affect the company's EV/EBITDA multiple?

- It will decrease the company's EV because it will receive cash and cash has a negative effect on EV since it is a non-operating asset. However, the EV/EBITDA multiple will increase.
  - Ex: Assume EBITDA = 100 and the asset sold contributed 20 of that EBITDA. They sell the asset for 40 so the new EV = 960 and the EBITDA falls to 80. 960 /80 = 12x compared to the previous 10x.

DCF:

82. How do you calculate levered free cash flow?

Net Income
+ Non-cash expenses (D&A)
- Capital expenditures
- Increases in net working capital
- Mandatory debt repayments
Levered free cash flow

83. What discount rate do you use for a levered DCF?

- Cost of equity because a levered DCF will give you equity value, not enterprise value.

84. Why do you typically do an unlevered DCF instead of a levered one?

- Levered free cash flow can be very volatile due to mandatory debt repayments and nuance accounting adjustments, so it is easier to use UFCF.

85. How should capex and depreciation change over the explicit forecast period?

- If FCF is growing, then capex should exceed depreciation. They shouldn't be equal because, due to inflation your dollar of capex is worth less now then a dollar of depreciation from 5 years ago.

86. If you are valuing a foreign company how does that change your cost of capital assumptions?

- You would calculate risk free rate by using their countries government bonds. You would calculate beta by comparing their returns to their country's index.

87. Why do you use mid-year convention in a DCF?

- You are trying to value the business as if you get cash flows throughout the whole year rather than just one big check at the end of each year. The average of getting cash flows throughout the whole year is the middle of the year, AKA 0.5.

88. What impact does the mid-year convention typically have on a DCF?

- It will produce a higher value because the discount factors will be smaller. 0.5 compared to 1.

89. What are the formulas for un-levering and levering beta?

- Unlevered = levered beta / (1 + (debt/equity) * (1-T))
- Levered = unlevered beta * (1 + (debt/equity) * (1-T))

90. Should you use a company's current capital structure or optimal capital structure to calculate WACC?

- You should use the optimal capital structure because this is the capital structure of the company in the future and the majority of your value in a DCF comes from significantly in the future.

91. How do cost of equity, cost of debt and WACC change as a company uses more debt?

- Cost of equity and cost of debt always increase because there is more risk of bankruptcy.
- If the change in WACC were to be graphed as WACC on the Y axis and amount of debt on the X axis, it would represent a Nike swoosh. It will gradually go down and then spike up as the risk of bankruptcy exponentially increases.

92. If you are using the multiples method to calculate terminal value, do you use the multiples from precedent transactions or from trading comparables?

- You typically would use somewhere in the middle because it would be conservative, but some say precedent transactions because inherently you are assuming that you sell the business at the end of stage 1.

93. What is one problem with using EV/EBITDA multiples to calculate terminal value?

- It doesn't include capex.

94. How do taxes affect the DCF?

- FCF
- After-tax cost of debt
- Beta

95. Does a levered valuation change if the capital structure is different?

- Theoretically it shouldn't because beta will change, but then levered free cash flow would change as well. The change in beta will be equally offset from the change in levered free cash flow.

96. Why does beta go down if you increase the tax rate?

- Levered beta will decrease if you increase the tax rate because as the tax rate increases you reduce some of the risk associated with leverage. Increases tax savings from the interest tax shield.

97. A company buys a factory for $100 in its 4th year. How would the DCF/Enterprise Value change for the company?

- Include additional CapEx spending of $100 in Year 4 of the DCF, which would reduce Free Cash Flow for that year by $100.
- The Enterprise Value, in turn, would decrease by the present value of $100 in Year 4.
- You would calculate the difference by dividing $100 by ((1 + Discount Rate)^4). Then you would subtract this amount from the Enterprise Value

98. How would raising $100M debt in Year 3 affect the DCF valuation of a company?

- Within the context of a DCF, the amount of debt you have directly impacts the WACC formula. Accordingly, you could change the WACC formula for periods after Year 3 and discount cash flows beyond that at the new WACC. Note that the other component of the DCF valuation is based on unlevered free cash flows, so additional interest from any raised debt will not affect them.

Trading and Transaction Comparables:

99. Which company should be worth more: A $100 million EBITDA healthcare company or a $100 million EBITDA industrials company? Assume growth rates, margin, and all other financial stats are the same.

- Most likely the healthcare company will be worth more because it will be less capital intensive. Therefore, the healthcare company will trade at a higher multiple.

LBO:

100. What are 10 ways to boost returns in an LBO?

- Reduce purchase price
- Increase exit value
- Shorten holding period
- Increase debt consideration
- Dividend recap
- Operating improvements
  - Revenue growth
  - Reduce COGS
  - Increase D&A
  - Reduce tax rate
  - Reduce increase in net working capital

101. How to quickly approximate IRR's in a LBO

- 2x MOIC in 3 years: ~25% IRR
- 2x MOIC in 5 years: ~15%IRR
- 3x MOIC in 3 years: ~45%IRR
- 3x MOIC in 5 years: ~25% IRR

102. What is the rule of 72? What is the rule of 114?

- The rule of 72 and 114 are two mental math tricks you can use to determine the IRR of an LBO transaction. Whenever you are asked to derive an actual number for an IRR, you can typically use these rules. The rule of 72 stipulates that the time it takes to double an investment is 72 divided by that time period. Although not 100% accurate, it will suffice in an interview setting. For example, the rate you get if an investment doubles in 3 years is 24%; 4 years is 18%; 5 years is 14.4%, etc. The rule of 114 stipulates that the time it takes to triple an investment is 114 divided by that time period. For example, the rate you get if an investment triples in 3 years is 38%; 4 years is 28.5%, 5 years is 25%, etc.

103. Basic Paper LBO: A PE firm acquires a $100 million EBITDA company for a 10x purchase multiple and funds the deal with 60% debt. The company's EBITDA grows to $150 million by year 5, but the exit multiple drops to 9x. The company repays $250 million of debt throughout the 5 years and generates no extra cash. What is the MOIC and IRR?

- Sources and Uses:

Sources		Uses	
Debt	1,000*60% = 600	Purchase Price	100 * 10x = 1,000
Equity	1,000 - 600 = 400		
Total	1,000	Total	1,000

- Exit valuation = 150 * 9x = 1,350. How much debt remains in the business = 600 - 250 = 350. How much equity is in the business when you sell = 1,350 – 350 = 1,000.
- Initial investment = 400. Exit equity value = 1,000 MOIC = 1,000 / 400 = 2.5x. MOIC of 2.5x implies ~20% IRR.

104. Basic Paper LBO Example 2: A PE firm acquires a $500 million EBITDA company for a 10x purchase multiple and funds the deal with 6x leverage. The company's EBITDA grows to $750 million by year 5 and the exit multiple remains the same at 10x. The company generates $50 million levered free cash flow per year throughout the 5 years. What is the MOIC and IRR?

- Sources and Uses:

Sources		Uses	
Debt	500*6x = 3,000	Purchase Price	500 * 10x = 5,000
Equity	5,000 – 3,000 = 2,000		
Total	5,000	Total	5,000

- Exit valuation = 750 * 10x = 7,500. How much debt remains in the business = 3,000 – (50 * 5) = 2,750. How much equity is in the business when you sell = 7,500 – 2,750 = 4,750.
- Initial investment = 2,000. Exit equity value = 4,750 MOIC = 4,750 / 2,000= ~2 - 2.5x. MOIC of 2.5x implies ~20% IRR.

M&A:

105. Company A is going to acquire company B. Company A has the following statistics: 10x P/E, 10% cost of debt, 3% cash interest, 20% tax rate. Company A is using the following considerations to acquire B: 1/3rd stock, 1/3rd debt, 1/3rd cash. Company B has a P/E of 5x. Is this transaction accretive or dilutive?

- First you have to convert the statistics to yields. 10x P/E = 1/10 = 10% cost of equity. Pre-tax cost of debt = 10% so apply taxes, 10% (1-.2) = 8%. Cash interest is fine at 3%.
- Apply the considerations as a weighting to get WACC. 10% *.333 + 8% * .333 + 3% * .333 = 3.3% + 2.6% + 1% = ~7%
- Compare WACC to target yield. P/E of 5x = 1/5 cost of equity = 20% cost of equity. 7% < 20%, therefore this transaction is accretive.

106. You are given the following information, calculate what the synergies must be for this deal to be neither accretive nor dilutive. Acquirer info: P/E: 10x, net income: $100. Target: P/E: 15x, net income: $50.

	Acquirer	Target	Pro Forma
P/E	10x	15x	10x
Net income	100	50	175
Market value	1000	750	1750

- The blue font is what you have been given. To get market values, you multiple P/E * net income. You can then add market values together to get PF. If the transaction is neither accretive nor dilutive, then you know P/E of the PF entity must be the same as the acquirer. You then divide PF market value by PF P/E to get PF net income of 175. The difference between 175 and (100+50) is 25. Therefore, you must have $25 synergies for this deal to be breakeven.

107. Company A is acquiring company B. Company A statistics: share price: $25, P/E: 10x, shares outstanding: 4,000. Company B statistics: share price: $60, P/E: 12x, shares outstanding: 1,000. Calculate the accretion/dilution in $ terms assuming an all-stock transaction.

	Acquirer	Target	Pro Forma
Share price	25	60	
P/E	10x	12x	
EPS	2.50	5.00	2.34
Shares outstanding	4,000	1,000	6,400
Net income	10,000	5,000	15,000
Offer value			60,000
Acquirer shares issued			2,400
Accretion / dilution ($)			(0.16)

- The blue font is what you have been given. A Net income: MV = 25 * 4,000 = 100,000. Net income = 100,000 / 10x = 10,000. B Net income: MV = 60 * 1,000 = 60,000. Net income = 60,000 / 12x = 5,000. Offer value = B MV. Acquirer shares issued: 60,000 / 25 = 2,400. PF shares outstanding: = 2,400 + 4,000. PF EPS = 15,000 / 6,400 = 2.34. Dilution: 2.34 – 2.50 = (0.16)

108. An acquirer purchases a company for a $1 billion equity purchase price, and this target has $600 million in common shareholders' equity and no goodwill. The acquirer plans to write up the target's PP&E and other intangible assets by $100 million. Assuming a tax rate of 20%, how much goodwill is created?

- The allocable purchase premium = 1,000 – 600 = 400. PP&E and other intangibles are written up 100. Therefore, you have 300 still left to allocate. You also have to include the new creation of a DTL: 100 * 20% = 20. The DTL is a liability so you have to add it to your goodwill creation so that the balance sheet balances. Total goodwill created: 300 + 20 = 320.

109. How are deferred tax liabilities created in M&A deals?

- A deferred tax liability is created when cash taxes paid are expected to exceed book taxes in the future. It is created because in M&A deals it is common for there to be fixed asset write-ups. Write-ups of definite-life fixed assets in return create additional D&A expense. The IRS does not allow this additional D&A expense to be tax deductible. Therefore, the tax number on your income statement is less than what you actually pay in cash taxes.

110. Company E has an EBITDA of $200M and Company F has an EBITDA of $100M. Let's say that Company E acquires Company F and realizes $100M in revenue synergies from additional unit sales and $100M from cost synergies. What is the pro forma EBITDA? Assume that the pro forma company has a gross margin of 70%.

- To determine the pro forma EBITDA, we must add the EBITDA of both companies and also add in the synergies. However, we must note that the revenue synergies of $100M are from additional unit sales and are not a direct addition to EBITDA. These revenue synergies of $100M imply that the pro forma company will be able to drive more unit sales, but they will be subject to COGS. The impact on EBITDA will be $100M in revenue synergies x 70% gross margin, equaling $70M in additional EBITDA. We then add the remaining synergies and calculate pro forma EBITDA ($200M Company E EBITDA + $100M Company F EBITDA + $100M cost savings + $70M from revenue synergies) to arrive at $470M EBITDA for the pro forma company.

Restructuring

111. What is the value of the equity, given the following info? EBITDA: $50, EV/EBITDA 4x, Senior debt of $100, Junior debt of $200

- The answer is 0 because debt principal > EV. Junior debt would trade at 50.
  - The value of the business is 200. 100 is used up for recovery of the senior debt, they get paid first. 100 is left over for junior debt. Junior debt is only 50% recovered, 100/200 = 0.5. Equity has nothing left.

112. How does restructuring affect the three financial statements?

- COGS might increase due to higher vendor costs
- Non-recurring legal and financial fees
- Writing off several accounts receivable
- Reduce capex

Debt:

113. Why do some countries have negative yielding debt?

- Bond is trading at a significant premium which implies a negative yield.
  - Various reasons why investors would buy negative yielding debt:

        - Some financial institutions are required to hold a certain amount of government debt. Ex: central banks, pensions, insurance companies.
        - Some believe there is potential upside.
        - Some believe there is less loss in negative yielding bonds than other investment alternatives.
    - Central banks will set negative or near zero interest rates to encourage lending, also can prevent deflation.

114. What does an inverted yield curve mean?

- Yield is graphed on the y axis, term/maturity on the x axis. As the term of debt increases, the yield decreases.
- Why this happens:
    - Investors are demanding longer term debt because they are expecting rates to decrease and want to lock in the current rate for a long period of time.

Level 3:

General

115. You have a company with $100 of revenue, 20% EBITDA margin, and cost structure of 40% fixed and 60% variable. What is EBTIDA if units sold increases by 10%?

- Before the sales increase, EBITDA = 20 and Costs = 80. How much of those costs were variable? 60% * 80 = 16 * 3 = 48. Fixed costs = 32.
- A 10% increase in variable costs of $48 comes out to 52.8. New sales number is 110. 110 – 52.8 – 32 = 25.2. 25.2 is the new EBTIDA.

Valuation:

116. Company has the following stats: EV/EBITDA = 10x, Net Debt/EBTIDA = 4x, Equity Value = 300. What is the EV of the firm?

- How much of the capital structure is debt? 4/10 = 40%. If debt is 40%, then equity must be 60%. 300/0.6 = 500 which is the enterprise value of the firm.

117. What is the relationship between including an income or expense line item and the implied equity value calculation at the end of a DCF?

- If you include an income or expense in FCF, then you should exclude the corresponding asset or liability when moving from EV to equity value. If you capitalize a company's operating leases and count them as debt, then you should exclude the rent expense from your FCF calculation.

118. Does liquidation value give you an enterprise value or an equity value?

- It gives equity value because you are valuing all company assets and not just core business, in addition, you have already taken out liabilities during valuation.

119. If you are using an EV/EBITDAR multiple how do you have to adjust EV?

- Since you are excluding rent expense, you must capitalize the operating leases and add them back to EV as you would a debt value.

120. Why do some people argue that you should not add capital leases when moving from equity value to EV?

- Some say it is an operational item since renting vs. owning buildings is an operational decision, not a financial one. However, most people believe that leases are a debt like obligation since they have a commitment and have scheduled payments, so you add them back.

DCF:

121. What tax rate should you use when calculating FCF? Effective tax rate, cash tax rate or statutory tax rate?

- You want to use the option available that represents cash taxes paid since you are calculating FCF. If you have cash tax rate, use that. If you don't you can use the effective tax rate and adjust for deferred taxes.

122. How do net operating losses factor into FCF?

- You can set up a NOL schedule and have them reduce the company's cash taxes over time, but it is way easier to add NOL's as a non-core business asset in the EV calculation at the end.

123. If you are valuing a firm on March 31st, and you want to include both the stub period and the mid-year convention, what are the discount periods you would use?

- March 31st = 0.25 year, so you exclude that quarter. Stub period = (1 – 0.25) = 0.75. Then we apply mid-year and stub comes out to be 0.75/2 = 0.375. For the normal year after that you do 0.75 + 1 – 0.5 = 1.25. From there on you just add 1 additional year to that. Ex: year 2 = 2.25.

124. How do terminal value calculations change when using the mid-year convention?

- You have to adjust the Gordon growth formula by bringing it half a year closer to the present (if not using a stub). Ex: Gordon growth without adjustment will give you TV at 5.5 years, when you just want 5 years. You do not need to adjust exit multiple approach

125. How does accelerating depreciation in a DCF affect valuation (higher or lower EV)?

- It would produce higher FCF during the forecast period which one might lead to believe would lead to a higher EV. But the majority of value in a DCF comes from TV, so if you are doing Gordon growth there would be a lower last year of FCF to build off of and therefore lower overall TV and lower EV. However, if you are determining terminal value through the exit multiple method then there would be no negative impact to terminal value because you would be using EBITDA which excludes all D&A effects and therefore accelerating depreciation would produce a higher EV.

126. What is the difference between raw and adjusted beta?

- Raw: regression to the index, variance
- Adjusted: estimation of future beta, by taking a proportion of beta and 1

LBO:

127. How does a dividend recap affect MOIC and IRR?

- MOIC doesn't change, but IRR increases because time value of money. You still have to pay back the additional debt you borrowed to do the dividend recap, so your dollar return from the LBO does not change, but a dividend recap allows you to get cash out of the business earlier, therefore increasing your IRR.

128. What might trigger multiple expansion in an LBO?

- Multiple expansion is possible when a company's ROIC increases and its WACC stays the same. Very dependent on market conditions though.

M&A:

129. Does a seller prefer cash or stock deals?

- Most commonly sellers will prefer cash because they are not stuck with acquirer stock, but it does create immediate tax expenses. Stock funded acquisitions can delay stock expenses and it may be helpful to have shares in the acquirer company if you believe they will appreciate.

130. Why do buyers prefer Asset purchases and sellers prefer stock purchases?

- In asset purchases, buyers can pick out the assets they want rather than buying the whole business, also the IRS does accept D&A write-ups as tax deductible when it is related to an asset purchase. Sellers prefer stock purchases because they must pay taxes on the proceeds from assets sales and any gains associated with that.

131. Do NOL's carry over from a target to the pro forma business?

- Not all of them. Sec. 382 limits the amount of NOL's that transfer over during transactions. The limit is usually calculated as market cap * long-term tax-exempt rate (usually ~6 – 8%).

Restructuring

132. Do sellers prefer stock or asset deals in distressed situations?

- Sellers prefer stock deals because you can eliminate several liabilities. Buyers prefer asset sales because they create less taxes.