6. (4) Which perfect-market assumptions does the CAPM need? Which perfect-market assumptions does it not need? Need All. Yes, the perfect market is an assumption underlying the CAPM. In addition,

1). Investors are rational utility maximizers.

2). Investors care only about overall portfolio mean rate of return and risk at one given point in time.

3). All parameters are known.

4). All assets are traded. Every investor can purchase every asset.

7. (4) A 1-year semi-annual coupon bond promises to pay $100,000. The prevailing interest rate on such bonds is 4%. What is its price? Ans: Can't calculate, since we need expected cash flow

8. (4) The 2016 inflation rate in Argentina is 35% per annum. The local bond yield is 30% per annum. What exactly is the real rate of return? Is this an optimistic of a pessimistic scenario for a retail investor? (1 + 30%)/(1+35%) = 1+R, R<0, Negative return, therefore a pessimistic scenario

9. (4) If a stock offers a normally distributed rate of return of 5 bp per month with a volatility of 4% per trading day (truncated at –90% and +90%), then what would you expect to end up with for a buy-and-hold one-year investment strategy investing $1 today? Ans: volatility doesn't matter, 1.0005^12

10. (4) Is it easier to maintain an equal-weighted portfolio than a value-weighted portfolio? Value-weighted portfolio

11. (4) How would you arbitrage a situation in which there is a risk-free rate and another asset with an expected rate of return lower than the risk-free rate? Short asset with lower expected rate of return, long the asset with high risk free rate asset

12. (4) The average mutual fund trading in 2014 had positive alpha of about 1-2% per annum over the last 3 to 5 years. Why? Survivorship Bias

13. (4) What is strong market efficiency? Strong market efficiency says that all information, both public and private, is reflected in today's stock prices, so that nothing—not even private insider information—can be used to beat the market. Put differently, the market is the best analyst and cannot be beat.

14. (4) List 3 human bias problems that managers have to deal with. Ans: overconfidence, relativism, and compartmentalization

15. (4) Why is it not possible that firms can have eternal negative growth rates g of earnings? Ans: the firm will declare bankruptcy

16. Cologuard is a non-invasive DNA-based test for colon cancer, almost as good as a colonoscopy. It could take over the global colonoscopy market, a $15 billion/year industry, but its patent will run out in 7 years. Moreover, its market-beta is very low. What would you estimate its value to be? Ans:15 billion * 7 / discount rate Without the discount rate, we can not estimate the value

17. (10) What are the first interest and principal payments on a 20-year monthly level-payment loan with an interest rate of 5% per annum? Ans: N = 20*12 I/Y = 5%/12 PV = 1 FV = 0, get PMT from the financial calculator PMT = 0.66%. Interest = 100% * 5%/12 = 0.417% . Principal payment percentage = 0.66% - 0.417% = 0.253%.

$$PV = \frac{C}{r}[1 - \left(\frac{1}{1+r}\right)^{n}]$$

$$PV = 1, FV = 0,\ PMT = 0.66\%$$

$$Interest = 100\% \times \frac{5\%}{12}$$

$$Payment = 0.66\% - 0.417\% = 0.253\%$$

18. (4) How would a hedge fund maximize a Sharpe ratio even in the absence of any skill whatsoever? Ans: we manipulate the expected return almost the same, and then volatility will be very small. In this case, the sharpe ratio is extremely large.

19. (4) How is an efficient market different from a perfect market?

20. (12) Stocks A and B have expected rates of return of 1% and 2% respectively, and standard deviations of 10% and 20%. Their returns have 50% correlation. If you invest 1/3 of your portfolio in A and 2/3 in B, what is your portfolio expected rate of return and standard deviation?

21. List some strategic options: Monika

22. (12) A Falcon-9 rocket is carrying a communication satellite. The cost of capital for rockets is about 5%; for communication satellites, it is 20%. 1-in-20 rockets tend to blow up. The rocket costs $60 million. The comm satellite costs $300 million, and is expected to fail with a 1-in-10 probability every year. If it functions, it is expected to earn a net of $100 million in a year. Is this a positive NPV investment? Ans:

PV(spaceX) = -60 + (60*93%)/(1+5%) <= 0, PV(communication) = -300 + (90% * (100+300) * 93%)/(1+20%) <= 0. So both parts has negative NPV.