

**Part I. Answer any seven of the following ten questions, 4 minutes each.**

1. Use binomial distribution to calculate probability with  $p=.5$ .  $p = .5^{10} + 10 \cdot .5^9 \cdot .5 = 11 \cdot .5^{10} = .0107642$ . The probability is low, but it is not so low that these things shouldn't happen regularly. There are many ways to pick the time interval over which one looks, on in a hundred should happen several times a year.
2.  $PDV = (\$10\text{million}/(.06)) \cdot (1 - 1.06^{-25}) = \$127.834\text{million}$ . (standard annuity formula). Interest on this is  $\$7.670$  million, or  $\$7,670$  per student per year, so tuition should be  $\$50,000 - \$7670 = \$42,330$
3. Both are out of the money, he hopes for volatility since he has a "long straddle" which benefits him only if price moves a lot, doesn't matter which way. He would hope for a quiet market if he wrote an out of the money put and an out of the money call, in which case he gets to keep the premium on both if little happens to price.
4. Using put-call parity, Mary's portfolio is worth the pdv of the exercise price, or  $100 \cdot \$100 / 1.05 = \$9523.81$  (options lecture)
5.  $= \$62 \cdot 1.1^{10} = \$78.20$ . Selling price in a year has to cover both storage and interest.
6.  $= (.48/.52)^{10} = 0.449$  (Lecture 17 slide 40)
7.  $= \$500,000 / (1/.005 - (1/.005) \cdot 1/1.005^{300}) = \$3221.51$  (Lecture 12 slide 16)
8. mean = .15, standard deviation =  $(.5 \cdot .1^2 + .5 \cdot .6^2 + 2 \cdot .25 \cdot .1 \cdot .6)^{.5} = 46.37\%$
9. Lecture 9 slide 7. Discount =  $.01 \cdot 60 / 360 = .01$ , yield =  $(\text{discount} / (1 - \text{discount})) \cdot 365 / 60 = 6.1448\%$
10.  $pdv = (x / (r - g)) \cdot (1 - 1 / (1 + r)^T)$

**Part II. Answer any seven of the following ten questions, 4 minutes each.**

11. Lecture 18, slides 10-12
12. Lecture 16 slide 28
13. Lecture 17 Slides 11 and 12, the first two terms refer to the role an agent plays in a transaction, the same person can be a broker in one and a dealer in another, but not both broker and dealer in one transaction; the term "broker-dealer" is an institution that is empowered to hire brokers and dealers.
14. Lecture 17, slide 44
15. Lecture 15 slide 4
16. Lecture 14, slide 7
17. Lecture 14, slide 16
18. Lecture 13, slide 37
19. Lecture 7, slide 10
20. Lecture 6, slide 21-2

**Part III. Answer any seven of the following ten questions, 4 minutes each.**

21. Fabozzi, p. 530
22. Fabozzi pp. 407-8
23. Fabozzi, p. 438, recent news is that they were issued to people who could not afford them and that they are defaulting in record numbers.
24. Fabozzi, p. 342

25. Systematic risk is in Fabozzi, p. 246, it is that part of a securities risk that cannot be eliminated through diversification. Systemic risk is risk that the failure of one financial institution will bring down, through a chain of events, the whole financial system.
26. Fabozzi, p. 174
27. Fabozzi, p. 454
28. Fabozzi, p. 128
29. Fabozzi, p. 346
30. Fabozzi, p. 210

**Part IV. Answer any seven of the following ten questions, 4 minutes each**

31. David Swensen said the Yale portfolio was 12% in US equities. (15% in foreign equities, 4% US bonds, and so 31% marketable securities, 25% absolute return, 27% real assets, and 17% private assets). Of all these, he said 96% were “equity-like.” This is very different from a traditional university endowment portfolio, which would have far more than 4% in bonds. Swensen believes portfolio returns depend mostly on the asset class, rather than the picking of individual assets, and he believed that these other asset classes had the potential to outperform bonds.

32. Redleaf said there is “unbelievable price discovery” for large stocks. We know what a price of a GE share is worth, the price of a man’s suit is hard to pin down. Stocks are traded on a two-sided double auction, men’s suits are not, and so suit prices vary all over. About GE, “It is an open question if anyone could have any significant information about such a big enterprise.” With Sun Country, they were able to buy a significant interest in the company, and then get involved, change the company’s business strategy.

33. Masucci said that it was his philosophy that it is advantageous to get into areas where financial markets are innovating. He stressed that one survives on one’s human capital—one should never think that one’s position is secure in a job, one must keep thinking about what special knowledge one has that will be needed in the future. Staying close to the innovations is high-risk. He said he was willing to work for Merrill Lynch but only in New York, where the innovations are happening. He worked for the developer of SAMs (shared appreciation mortgages, which were a revolutionary idea in the 1990s). He pointed out that SAMs ultimately failed after home prices in the UK soared (making borrowers regret that they had borrowed via SAMs) and interest rates fell (making conventional loans cheaper), and that illustrates how risky financial innovations are. But, through all the turmoil, one can hope to survive and be stronger from the experience.

34. Click on the Working reading on the syllabus, and look at page 315 for his definition, in italics. He does not mention deferred delivery in his definition because often cash markets have even more deferred delivery.

35. Click on Macro Markets, Chapter 5, pp.84-5. Home prices are smoother, more momentum, have runs through time that violate random walk properties, because these markets are illiquid, inefficient, populated by amateurs rather than professionals.

36. Click on the Irving Fisher reading in the syllabus and read before grading this question.

37. Fabozzi, p. 535

38. Siegel (pp. 73-6) makes much of this. Smith thought that stocks always outperform other investments, but read Siegel before grading to get the nuances.

39. Siegel pp. 194-5, a terrible hedge in the short term, a good hedge in the long term.

40. Leverage refers to the ratio of debt to equity. A hedge fund is defined in Lecture 16, slide 16. If hedge funds get highly levered, then they are vulnerable to bankruptcy, and this may have systemic effects, as happened in 1998 with Long Term Capital Management.