

## Session 16a: Post class test solutions

1. **c. \$6.17 million.** It is the difference between the present value of investing in year 2 versus year 5, in after-tax terms:
  - $50(1-.4)/1.1^2 - 50(1-.4)/1.1^5 = \$6.17$  million
2. **d. \$71.43 million.** The synergy benefits accrue to the combined firm. To discount them, you should use the cost of capital (9%) of the combined firm:
  - Value of synergy =  $\$5 / (.09 - .02) = \$71.43$  million
  - Again, since it is next year's benefit, no need for  $(1+g)$
3. **d. \$2,963.** The easiest way to do this is to lay out the cash flows each year. In years 1,2 and 3, you have positive cash flows of \$6000/year and in years 4 and 5, you have negative cash flows of \$9,000/year. Discounting back at the cost of capital of 9%:
  - $NPV = 6000/1.09 + 6000/1.09^2 + 6000/1.09^3 - 9000/1.09^4 - 9000/1.09^5 = \$2,963$
4. **d. I would pay as long as I have exclusive rights to the technology and there is uncertainty about the potential markets and costs in the future.** This is an option that derives its value from uncertainty. Even if it is out of the money today (non viable), the uncertainty about how the value will evolve will give the option value. (The extent of the value will depend upon how out of the money it is today and how much uncertainty there is about the future).
5. **c. Invest in Brazil, but only if the value of the "option to expand" exceeds the negative NPV.** The value of the option to expand will depend upon how much exclusivity you will have when you decide to expand and the uncertainty about the size of the market; the more exclusivity you have and the more uncertain you feel, the greater is the value of the option to expand.