

## Session 11: Post class test solutions

- a. \$261.12 million.** To compute the market value of the debt, discount the expected interest expenses and the principal on the debt at the pre-tax cost of debt

  - Market value of debt =  $12.5 * (1 - 1.04^{-5}) / 0.04 + 250 / 1.04^5 = \$261.12 \text{ m}$
  - The first term is the present value of \$12.5 million as an annuity for 5 years, discounted back at 4%. The second term is the present value of the face value of the debt at the end of year 5.
- c. \$77.56 million.** The debt value of leases is the present value of the operating leases at the pre-tax cost of debt.

  - Debt value of leases = PV of annuity of \$12 million @5% for 8 years = \$77.56 million
- d. 6.6%.** The first step is to compute the market value weights of debt and equity

  - Debt to capital ratio =  $80 / (120 + 80) = 40\%$
  - Cost of capital =  $9\%(.6) + 4\% (1-.4) (.4) = 6.36\%$
- c. 7.55%.** The first step is to decompose the convertible bond into its debt and equity components. To do this, value the convertible bond as if it were a straight bond by discounting the coupons and face value back at the pre-tax cost of debt:

  - Value of straight bond portion = \$2 million (PV of annuity for 10 years @5%) + \$100 million /  $1.05^{10} = \$76.83 \text{ million}$
  - Value of conversion option = Market value of convertible – Straight bond value =  $\$120 - \$76.83 = \$43.17 \text{ million}$
  - Overall value of equity = \$143.17 million
  - Cost of capital =  $10\% (143.17 / (143.17 + 76.83)) + 5\% (1-.4) (76.83 / (143.17 + 76.83)) = 7.55\%$
- a. 8.78%.** First, compute the preferred dividend yield, which is also the cost of preferred stock:

  - Preferred dividend yield =  $\$6 / 80 = 7.5\%$
  - Cost of capital =  $12\% (200 / 400) + 6\% (1-.4) (100 / 400) + 7.5\% (100 / 400) = 8.78\%$