

Session 12a: Post class test solutions

1. **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 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.
2. **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
3. **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 = $9\%(.6) + 4\% (1-.4) (.4) = 6.36\%$
4. **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 = $10\% (143.17 / (143.17 + 76.83)) + 5\% (1-.4) (76.83 / (143.17 + 76.83)) = 7.55\%$
5. **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 = $12\% (200 / 400) + 6\% (1-.4) (100 / 400) + 7.5\% (100 / 400) = 8.78\%$