# Lab 4: Credit Risk

**Question 1**:

A four-year corporate bond on a principal of $\$100$ provides a coupon of $4\%$ per year payable semi-annually and has a yield of $5\%$ expressed with continuous compounding. The risk-free yield curve is flat at $3\%$ with continuous compounding. Assume that defaults can take place at the end of each year (immediately before a coupon or principal payment) and that the recovery rate is $30\%$. Estimate the risk-neutral default probability on the assumption that it is the same each year, equal to $Q$.

**Question 2**:

Assume that a five-year corporate bond on a principal of $\$100$ pays a coupon of $6\%$ per annum (semi-annually). The yield is $7\%$ with continuous compounding and the yield on a similar risk-free bond is $5\%$ (with continuous compounding). Suppose that the probability of default is constant for each year and equal to $Q$. Also, suppose that the coupon payments happen halfway through each year, i.e., in year 0.5, 1.5, 2.5, 3.5, 4.5 and assume that defaults can happen immediately before a coupon payment. What is the estimated value of each year's default probability $Q$?