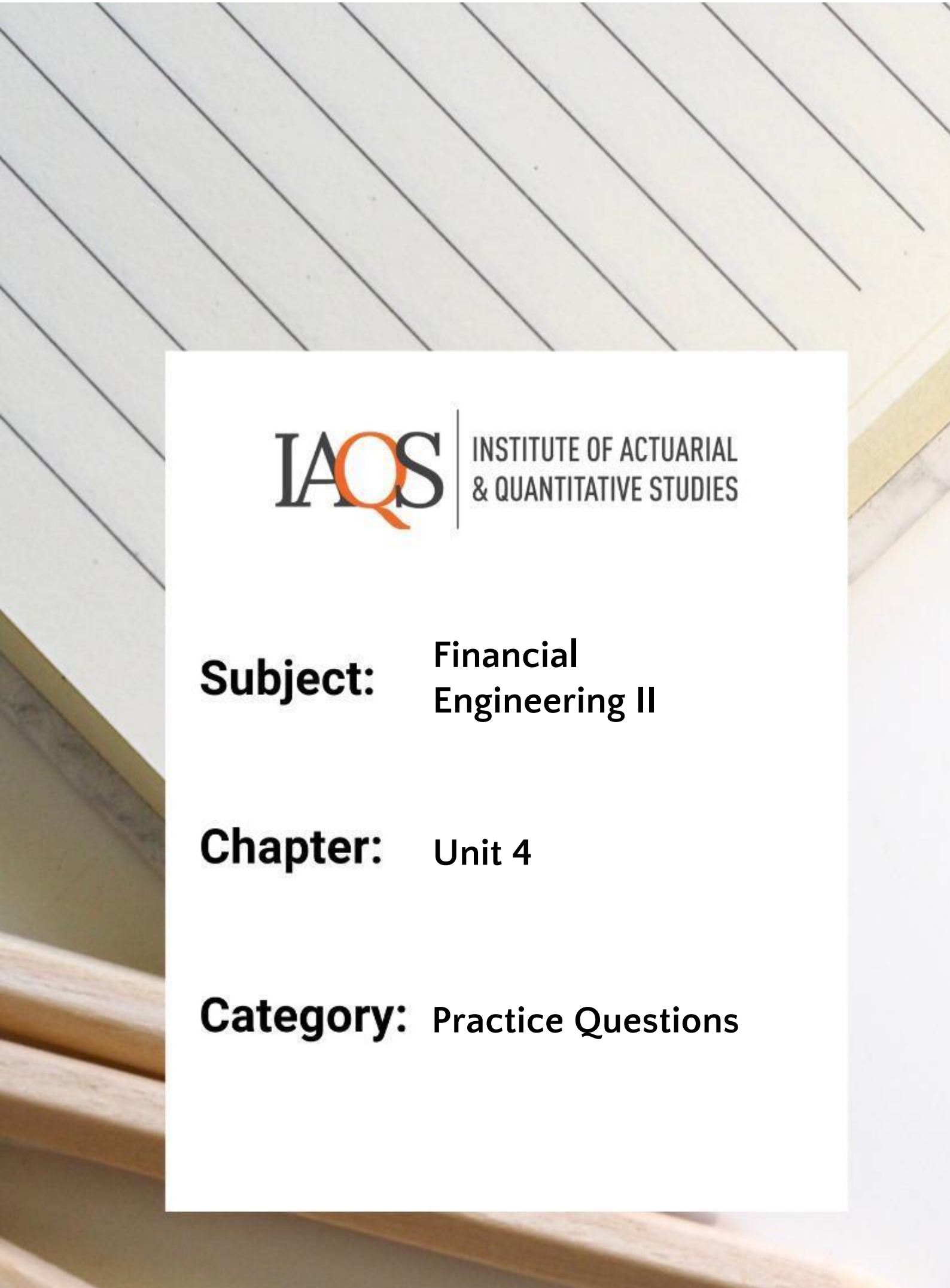

INSTITUTE OF ACTUARIAL & QUANTITATIVE STUDIES

Subject: Financial Engineering II

Chapter: Unit 4

Category: Practice Questions

1. What is the waterfall in a securitization?

2. CT8 Question 11 September 2008
i) Describe the Merton model for assessing credit risk.

A company has just issued a zero-coupon bond of nominal value £8m with maturity of one year. The value of the assets of the company is £10.009m and this value is expected to grow at an average of 10% per annum compound with an annual volatility of 20%. The company is expected to be wound up after one year when the assets will be used to pay off the bond holders with the remainder being distributed to the equity holders. Shares in the company are currently traded at a market capitalisation of £2.9428m.

ii) Estimate the risk-free rate of interest in the market to within 1% p.a., stating any additional assumptions that you make.

3. CT8 Question 6.1 September 2009
Describe the two-state model for credit-ratings.

4.Briefly describe the securitization process.

5.Define or briefly explain:

i) Delinquency Ratio
ii) Default Ratio
iii) Debt Service Coverage Ratio (DSCR)
iv) Weighted Average Coupon (WAC)
v) Weighted Average Maturity (WAM)
vi) Weighted Average Life (WAL)

6.What is the constant prepayment rate?

7.Define credit risk and explain briefly.

8.List the 5 C's of Credit and explain them.

9. Define Credit Rating and it's role in credit risk management.

10. What are the different types of credit risks? Explain them briefly

11. What is Exposure at Default (EAD) and how is it calculated?

12. Explain Concentration Risk and how it is analysed.

13. Define Risk Adjusted Pricing.

14. CT8 September 2011 Q11

(i) Draw a diagram to illustrate the Jarrow-Lando-Turnbull model for credit default, defining any notation used. [4]

A model was proposed for a country's sovereign debt as follows:

The economy is in one of three states: 1 (good), 2 (bad) and 3 (default).
Transition intensities $\lambda_{i,j}$ are constant and as follows:

$$\lambda_{1,2} = 1;\ \lambda_{1,3} = 0;\ \lambda_{2,1} = 0.25,\ \lambda_{2,3} = 0.75;\ \lambda_{3j} = 0 \text{ for all } j \text{ and } \lambda_{1,1} = \lambda_{2,2} = -1.$$

It follows that if $p_i(t)$ is the probability that the economy is in state i at time t then:

$$\frac{dp_1(t)}{dt} = -p_1(t) + 0.25p_2(t)$$

and

$$\frac{dp_2(t)}{dt} = p_1(t) - p_2(t).$$

Set $h(t) = 2p_1(t) - p_2(t)$.

(ii) (a) Show that $\frac{dh(t)}{dt} = -1.5h(t)$.

(b) Derive a similar equation for k defined by $k(t) = 2p_1(t) + p_2(t)$.

Suppose that this country's economy is in state 2 at time 0.

(iii) Find the probability that it is in default at time 2. [4]

Assume a continuously compounded risk-free interest rate of 2% per annum and a recovery rate of 60%.

(iv) (a) Deduce the price under this model for a zero-coupon bond in this country with a redemption value of 100 and a redemption date in two years' time.