CQF Module 2.2 Exercises: Products and Strategies

1. Consider a 12 month period over which the variable interest rate (continuously compounded) r is given by

$$r(t) = \begin{cases} 5.3\% & 0 \le t < 3 \\ 4\% & 3 \le t < 6 \\ 6.1\% & 6 \le t \le 12 \end{cases}$$

Calculate the value of £1000 in 8 months time.

2. How much money would I invest today to guarantee £5000 in 6 months time if the rate of interest is 5%.

3. Find the values of the following portfolios of options at expiry, as a function of the share price:

(a) Long one share, long one put with exercise price E.

(b) Long one call and one put, with exercise price E.

(c) Long one call, exercise price E_1, short one call, exercise price E_2, where $E_1 < E_2$.

(d) Long one call, exercise price E_1, long one put, exercise price E_2. There are three cases to consider.

(e) Long two calls, one with exercise price E_1 and one with exercise price E_2, short two calls, both with exercise price E, where $E_1 < E < E_2$.

4. What is the difference between a payoff diagram and a profit diagram? Illustrate with a portfolio of short one share, long two calls with exercise price E.

5. Explain (in financial terms) what happens when an investor shorts a share?

6. Consider a put option to sell 200 shares the company XYZ pharmaceuticals for £25 a share. How should the option contract be adjusted after a 3-for-1 stock split? How is the option price affected?

7. Explain carefully the difference between hedging, speculation and arbitrage.

8. What is the difference between writing a call option and buying a put option?