

SIMON FRASER UNIVERSITY  
*Faculty of Business Administration*

**Sample Final Examination Questions**

BUS 818

Derivative Securities

NOTE: There will be two in-class and two takehome questions. Questions #1 and #3 are indicative of in-class questions and Questions #2 and #4 are indicative of takehome questions.

1. a) "A call option benefits from increases in the stock price and these increases can be very large. A put option benefits from stock price declines, but the stock price can only fall to zero. Therefore, if we have a put and a call on the same stock with the same terms, the put must sell for less than the call." Do you agree or disagree? Explain making sure that you identify relevant restrictions on the underlying arbitrage.

b) **Describe** the delta, gamma and theta for a time spread and a butterfly spread, both using puts.

2.a) Explain how the Black-Scholes model can be used to structure portfolios containing options. What is meant by the delta, theta and gamma of a position and how are these concepts used in portfolio design?

b) Explain how to create a position which is delta neutral and gamma negative and contains a long stock position. Describe a specific example of how the position would be implemented.

3. a) A long stock position can be "protected" by buying a put. How can the payoff on this portfolio of a stock and option be replicated using "dynamic hedging" strategies involving portfolios which combine only stock and bond positions?

b) Describe the various forms of portfolio insurance. How would these various forms of portfolio insurance perform in the face of discontinuous movements in equity prices such as the October 1987 market break?

4.a) Outline the continuous time derivation of the Black-Scholes option pricing model. What assumptions are being made to derive the results?

b) What are the limitations of applying the model to actual options prices (being sure to identify what corrections have to be made to the Black-Scholes formula to, e.g., incorporate dividend paying stocks)?

c) Under what conditions will American currency call options be exercised early?