MFE5130 – Financial Derivatives
First Term, 2019 – 20

Assignment 1
Due: 11:00pm, 9-October-2019

Important notes:
1. The assignment must be submitted via Blackboard.
2. All the chapters below stand for the textbook chapters.
3. Total: 9 Problems (Full Mark: 90).

Chapter 2:
Note: If the "effective annual interest rate" is r, a \$1 investment yields $(1+r)^n$ after n years.
4
14 (all the options in this problem have an expiration of 1 year.)

Chapter 3:
Note: If necessary, using the given information before Problem 3 to answer the following problems.
13
14 ("the value of the position" means "the payoff of the position")
15
16
17

Additional Problem 1 (Trading Volume and OI).

Consider a certain forward contract in MFE exchange. There are three traders, A, B, and C. Over one day, the following trades occur:
A long, B short, 9 contracts.
B long, C short, 3 contracts.
C long, A short, 3 contracts.
A long, C short, 2 contracts.

What are accumulated trading volume and open interest just after the fourth trades?

Additional Problem 2
Assume that $K_1 < K_2 < K_3$. We know that a $K_1-K_2-K_3$ butterfly spread is constructed by writing a K_2-strike straddle and long a strangle consisting of purchasing one K_1-strike put and one K_3-strike call. Suppose that the time to expiration of all the options in this butterfly are T.

Using the put-call parity, show that the profit of this butterfly spread at T is the same as the butterfly spread which is constructed by purchasing one K_1-strike call, selling two K_2-strike call and purchasing one K_3-strike call.