AS 288, Quiz 2 T122 Form: A

Name: _____ ID#:_____ Serial#:___

Directions: Show all work to receive full credit. You can use an approved SOA calculator or any scientific calculator. Quiz duration is 20 minutes. You may begin now. Good luck.

Strike K	Call Price	Put Price
975	77.716	43.015
1000	64.595	
1025	53.115	67.916

1. The continuously compounded annual interest rate r is 0.04. Investor A buys the index at time 0 and sells a 1025 strike call with $T = 0.25$. Investor B writes a 1025 strike put and lends x. The two investors have the same payoff functions. What is x?

a) 1000
b) 1007.40
c) 1014.80
d) 1025
e) 1037.40

Work shown (4 points):

2. You are a producer of gold, and have expenses of 800 per ounce of gold produced. Assume that the cost of all other production-related expenses is negligible, and that you will be able to sell all gold produced at the market price. In 1 year, the market price of gold will be 1 of 3 possible prices, corresponding to the following probability table:

Gold Price per ounce in 1-year	Probability
750	0.2
850	0.5
950	0.3

You hedge the price of gold by buying a 1-year put option with an exercise price of 900 per ounce. The option costs 100 per ounce now, and the coninuously compounded interest rate is 6%. Which of the following is closest to your expected 1-year profit per ounce of gold produced?

a) 0
b) 3
c) 6
d) 9
e) 12

Work shown (4 points):

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Work shown (4 points):

Buying the index and **selling a call** creates a *covered call.*

Same payoff function if one **write a put** for the same exercise price K and **lend** the present value of K.

Payoff of a *covered call* $= S_T - max(0, S_T - K) = S_T - max(0, S_T - 1025)$

Payoff of a *written put and lending* $= K - max(0, K - S_T) = K - max(0, 1025 - S_T)$

$S_T - max(0, S_T - 1025) = K - max(0, 1025 - S_T)$

$\rightarrow$The amount loaned here $x = Ke^{-rT} = 1025e^{-(0.04)0.025} = 1014.80$

Answer is C

2. You are a producer of gold, and have expenses of 800 per ounce of gold produced. Assume that the cost of all other production-related expenses is negligible, and that you will be able to sell all gold produced at the market price. In 1 year, the market price of gold will be 1 of 3 possible prices, corresponding to the following probability table:

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Work shown (4 points):

The cost of the put option is $100e^{0.06(1)} = 106.18$.

The table below shows the put payoff and profit before option cost for each market price.

Gold Market Price per ounce in 1-year S_T	750	850	950
Probability	0.2	0.5	0.3
Put payoff $= \max(0, 900 - S_T)$	150	50	0
Gold Expense	800	800	800
Profit before Option premium cost $= S_T + \max(0, 900 - S_T)$-Expense	100	100	150

Expected Profit before option cost $= 100(0.2) + 100(0.5) + 150(0.3) = 115$

Expected Profit $= 115 - 106.18 = 8.82$

Answer is D

Future plans

In addition to these paper-and-pencil quizzes, put Practice exams 1 and 2 into WebCT respondus for online quiz. The paper-and-pencil version will be practice for the paper-and-pencil SOA exam while the WebCT quiz will be practice for SOA FM/2 online exam.