Review Test Submission: Self Check Quiz: Chapter 18

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Course	EN.555.644.81.FA19 Introduction to Financial Derivatives
Test	Self Check Quiz: Chapter 18
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Attempt Score	0 out of 0 points
Time Elapsed	0 minute
Results Displayed	All Answers, Submitted Answers, Correct Answers, Feedback, Incorrectly Answered Questions

Question 1

0 out of 0 points

Which of the following is acquired (in addition to a cash payoff) when the holder of a put futures exercises?

Selected Answer: ✗ a. A long position in a futures contract

Answers:
a. A long position in a futures contract
✓ b. A short position in a futures contract
c. A long position in the underlying asset
d. A short position in the underlying asset

Response Feedback: The holder of the put acquires a short futures position which can be immediately closed out if desired.

Question 2

0 out of 0 points

Which of the following is acquired (in addition to a cash payoff) when the holder of a call futures exercises?

Selected Answer: ✓ a. A long position in a futures contract

Answers: ✓ a. A long position in a futures contract

b. A short position in a futures contract

c. A long position in the underlying asset

d. A short position in the underlying asset

Response Feedback: The holder of the call acquires a long futures position which can be immediately closed out if desired.

Question 3

0 out of 0 points

The risk-free rate is 5% and the dividend yield on the S&P 500 index is 2%. Which of the following is correct when a futures option on the index is being valued?

Selected Answer: a. The futures price of the S&P 500 is treated like a stock paying a dividend yield of 5%.

Answers:
a. The futures price of the S&P 500 is treated like a stock paying a dividend yield of 5%.

b. The futures price of the S&P 500 is treated like a stock paying a dividend yield of 2%.

c. The futures price of the S&P 500 is treated like a stock paying a dividend yield of 3%.

d. The futures price of the S&P 500 is treated like a non-dividend-paying stock.

Response Feedback: When a futures option is being valued the dividend yield is set equal to the domestic risk-free rate. In this case the domestic risk-free rate is 5%. A is therefore correct.

Question 4

0 out of 0 points

Which of the following is NOT true?

Selected Answer: a. Black's model can be used to value an American-style option on futures

Answers:
a. Black's model can be used to value an American-style option on futures

b. Black's model can be used to value a European-style option on futures

c. Black's model can be used to value a European-style option on spot

d. Black's model is widely used by practitioners

Response Feedback: A Black's model is used for valuing European options. A is therefore clearly false.

Question 5

0 out of 0 points

Which of the following is true when the futures price exceeds the spot price?

Selected Answer: a. Calls on futures should never be exercised early

Answers:
a. Calls on futures should never be exercised early
b. Put on futures should never be exercised early
c. A call on futures is always worth at least as much as the corresponding call on spot
d. A call on spot is always worth at least as much as the corresponding call on futures

Response Feedback: If the futures price is above the spot price a call on futures must be worth more than a call on spot. Both calls and puts on futures are sometimes exercised early.

Question 6

0 out of 0 points

Which of the following describes a futures-style option?

Selected Answer: a. An option on a futures

Answers:
a. An option on a futures
b. An option on spot with daily settlement
c. A futures on an option payoff
d. None of the above

Response Feedback: A futures style option is a futures contract on the option payoff.

Question 7

0 out of 0 points

A futures price is currently 40 cents. It is expected to move up to 44 cents or down to 34 cents in the next six months. The risk-free interest rate is 6%. What is the probability of an up movement in a risk-neutral world?

Selected Answer: a. 0.4

Answers:
a. 0.4
b. 0.5

c. 0.72

d. 0.6

Response Feedback: The probability of an up movement is (1-*d*)/(*u*-*d*). In this case *u* is 1.1 and *d* is 0.85. The probability of an up movement is therefore 0.15/0.25=0.6.

Question 8

0 out of 0 points

A futures price is currently 40 cents. It is expected to move up to 44 cents or down to 34 cents in the next six months. The risk-free interest rate is 6%. What is the value of a six.month put option with a strike price of 37 cents?

Selected Answer: a. 3.00 cents

Answers:
a. 3.00 cents
b. 2.91 cents
c. 1.16 cents
d. 1.20 cents

Response Feedback: The probability of an up movement is (1-*d*)/(*u*-*d*). In this case *u* is 1.1 and *d* is 0.85. The probability of an up movement is therefore 0.15/0.25=0.6. The option pays off zero if there is an up movement and 3 cents if there is a down movement. The value of the option is therefore $0.4x3xe^{-0.06x0.5} = 1.16$ cents

Question 9

0 out of 0 points

A futures price is currently 40 cents. It is expected to move up to 44 cents or down to 34 cents in the next six months. The risk-free interest rate is 6%. What is the value of a six month call option with a strike price of 39 cents?

Selected Answer: a. 5.00 cents

Answers:
a. 5.00 cents
b. 2.91 cents
c. 3.00 cents
d. 4.21 cents

Response Feedback: The probability of an up movement is (1-*d*)/(*u*-*d*). In this case *u* is 1.1 and *d* is 0.85. The probability of an up movement is therefore 0.15/0.25=0.6. The option pays off 5 cents if there is an up movement and zero if there is a down movement. The value of the option is therefore $0.6x5xe^{-0.06x0.5} = 2.91$ cents

Question 10

0 out of 0 points

Which of the following are true?

Selected Answer: a. Futures options are usually European

Answers:
a. Futures options are usually European
b. Futures options are usually American
c. Both American and European futures options trade actively are exchanges
d. Both American and European futures options trade actively in the OTC market

Response Feedback: Futures options trade on exchanges and are American.

Question 11

0 out of 0 points

Which of the following is true for a September futures option?

Selected Answer: a. The expiration month of option is September

Answers:
a. The expiration month of option is September
b. The option was first traded in September
c. The delivery month of the underlying futures contract is September
d. September is the first month when the option can be exercised

Response Feedback: The month of a futures option refers to the month of the underlying futures contract.

Question 12

0 out of 0 points

What is the cash settlement if a put futures option on 50 units of the underlying asset is exercised?

Selected Answer: a. (Current Futures Price – Strike Price) times 50

Answers:
a. (Current Futures Price – Strike Price) times 50
b. (Strike Price – Current Futures Price) times 50
c. (Most Recent Futures Settlement Price – Strike Price) times 50
d. (Strike Price – Most Recent Futures Settlement Price) times 50

Response Feedback: The cash payoff is the strike price minus the most recent futures settlement price times the size of the contract. The party exercising also gets a short futures

position which brings the value of what is received at the time of exercise equal to strike price minus the current futures price times the size of the contract.

Question 13

0 out of 0 points

What is the cash component of the payoff if a call futures option on 50 units of the underlying asset is exercised?

Selected Answer: a. (Current Futures Price – Strike Price) times 50

Answers:
a. (Current Futures Price – Strike Price) times 50
b. (Strike Price – Current Futures Price) times 50
c. (Most Recent Futures Settlement Price – Strike Price) times 50
d. (Strike Price – Most Recent Futures Settlement Price) times 50

Response Feedback: When the option is exercised the holder obtains the cash payoff in C and a long futures contract.

Question 14

0 out of 0 points

Which of the following is true?

Selected Answer: a. A futures option is settled daily

Answers:
a. A futures option is settled daily
b. A futures-style option is settled daily
c. Both a futures option and a futures-style option are settled daily
d. Neither a futures option nor a futures-style option is settled daily

Response Feedback: A futures style like a futures contract is settled daily. Regular options are not settled daily.

Question 15

0 out of 0 points

Which of the following is true about a futures option and a spot option on the same underlying asset when they have the same strike price? The expiration dates of the two options and the futures are all the same.

Selected Answer: a. A European call spot option and an American call futures option are equivalent

Answers: a.

A European call spot option and an American call futures option are equivalent

b.
An American call spot option and a European call futures option are equivalent

c.
A European put spot option and European put futures option are equivalent

d.
An American put spot option and American put futures option are equivalent

Response Feedback: The two European options are equivalent. This result is often used to price options on spot.

Question 16

0 out of 0 points

What is the value of a European call futures option where the futures price is 50, the strike price is 50, the risk.free rate is 5%, the volatility is 20% and the time to maturity is three months?

Selected Answer: a. 49.38N(0.05)0-49.38N(-0.05)

Answers: a. 49.38N(0.05)0-49.38N(-0.05)

b. 50N(0.05)-50N(-0.05)

c. 49.38N(0.1)-49.38N(-0.1)

d. 50N(0.1)-49.38N(-0.1)

Response Feedback: The formula is

$$c = F_0 e^{-rT} N(d_1) - K e^{-rT} N(d_2)$$

$$d_1 = \frac{1n(F_0/K) + \sigma^2 T/2}{\sigma\sqrt{T}} \qquad d_2 = d_1 - \sigma\sqrt{T}$$

In this case $Ke^{-rT} = F_0 e^{-rT} = 50e^{-0.05x0.25} = 48.38$

$$d_1 = \frac{1n(1) + 0.2^2 x 0.25/2}{0.2\sqrt{0.25}} = 0.05 \qquad d_2 = d_1 - \sigma\sqrt{T} = -0.05$$

The correct answer is therefore A.

Question 17

0 out of 0 points

What is the expected growth rate of an index futures price in the risk-neutral world?

Selected Answer: a. The excess of the risk-free rate over the dividend yield

Answers:
a. The excess of the risk-free rate over the dividend yield
b. The risk-free rate
c. The dividend yield on the index
d. Zero

Response Feedback: All futures prices grow at rate zero on average in a risk-neutral world.

Question 18

0 out of 0 points

When Black's model used to value a European option on the spot price of an asset, which of the following is NOT true?

Selected Answer: a. It is necessary to know the futures or forward price for a contract maturing at the same time as the option

Answers:
a. It is necessary to know the futures or forward price for a contract maturing at the same time as the option
b. It is not necessary to estimate income on the underlying asset
c. It is not necessary to know the risk-free rate
d. The underlying asset can be an investment or a consumption asset

Response Feedback: The futures price embodies all the relevant information needed about the spot price and the income on the asset. However, it is still necessary to know the risk-free rate.

Question 19

0 out of 0 points

Consider a European one-year call futures option and a European one-year put futures options when the futures price equals the strike price. Which of the following is true?

Selected Answer: a. The call futures option is worth more than the put futures option

Answers:
a. The call futures option is worth more than the put futures option
b. The put futures option is worth more than the call futures option
c. The call futures option is sometimes worth more and sometimes worth less than the put futures option
d. The call futures option is worth the same as the put futures option

Response Feedback: Put call parity is

$$c + Ke^{-rT} = p + F_0 e^{-rT}$$

When $F_0 = K$ it follows that $c = p$.

Question 20

0 out of 0 points

One-year European call and put options on an asset are worth $3 and $4 respectively when the strike price is $20 and the one-year risk-free rate is 5%. What is the one-year futures price of the asset if there are no arbitrage opportunities? (Use put-call parity.)

Selected Answer: a. $19.55

Answers:
a. $19.55
b. $18.95
c. $20.95
d. $20.45

Response Feedback: Put call parity is

$$c + Ke^{-rT} = p + F_0 e^{-rT}$$

Hence

$$F_0 = K + (c - p)e^{rT} = 20 + (3 - 4)e^{0.05x1} = \$18.95$$

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