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Exam I: Finance Theory Financial Instruments Financial Markets - 2015 Edition

PRMIA 8006

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QUESTION NO: 1

Which of the following statements are true:

A. Selling a call + Selling a put = Buying the stock + Bank deposit

B. Buying a call + Bank Deposit = Buying the stock + Selling a put

C. Buying a call + Selling a put = Buying the stock + Bank deposit

D. Buying a call + Bank Deposit = Buying the stock + Buying a put

ANSWER: D

Explanation:

:

The put-call parity can be expressed as:

Call – Put = Spot – PV of exercise price

Note that a negative sign above means a short position. The 'term PV of exercise price' is the same as a bank deposit placed today equivalent to the PV of the exercise price so that we will have the cash flow on the exercise date to exercise the option.

Therefore only Choice 'd' is the correct answer as rearranging the above gives us Buying a call + Bank Deposit = Buying the stock + Buying a put.

Choice 'd' is therefore the correct answer.

QUESTION NO: 2

If the spot price for a commodity is lower than the forward price, the market is said to be in:

A. contango

B. backwardation

C. a short squeeze

D. disequilibrium

ANSWER: A

Explanation:

:

When the forward prices are greater than the spot prices, the market is said to be in contango. When forward prices are lower than spot prices, the market is said to be backwarded. A short squeeze may contribute to backwardation. Choice 'a' is the correct answer.

QUESTION NO: 3

A bank advertises its certificates of deposits as yielding a 5.2% annual effective rate. What is the equivalent continuously compounded rate of return?

A. 4.82% B. 5%

B. 5.07%

C. 5.20%

ANSWER: B

Explanation:

:

The equivalent continuously compounded rate in this case can be calculated as ln(1+5.2%) = 5.07%. The other answers are incorrect.

Refer to the tutorial on interest rates for more details on how continuously compounded rates work.

QUESTION NO: 4

Which of the following is true about the early exercise of an American call option:

A. An early exercise of an American call option is advisable whenever the option is deep in the money and delta approaches 1

B. An early exercise of an American call option may be justified if an extraordinarily large dividend payment is imminent

C. An early exercise of an American call option is never a good idea as an option is always worth more alive than when it is dead

D. An early exercise of an American option, if ever to be done, should be done immediately after an ex-dividend date

ANSWER: B

Explanation:

:

Generally, it is not a good idea to exercise an option early as any more upside in the remaining period to expiry is being sacrificed. However, if an extraordinarily large dividend is coming due, and this dividend is larger than the interest foregone from holding the option, it may be a good idea to exercise the option early. In such cases, the exercise needs to happen before the ex-dividend date and not afterwards. Choice 'b' is therefore the correct answer.

Even if the option is deep in the money and delta is approaching 1, and exercise upon maturity is almost a certainty, it would still always be better to sell the option than exercise it . Therefore Choice 'a' is incorrect. Choice 'c' is correct in all cases except when a large dividend is coming in. Choice 'd' is not correct because an early exercise needs to happen prior to the ex-dividend date and not afterwards.

QUESTION NO: 5

[According to the PRMIA study guide for Exam 1, Simple Exotics and Convertible Bonds have been excluded from the syllabus. You may choose to ignore this question. It appears here solely because the Handbook continues to have these chapters.]

What is the current conversion premium for a convertible bond where $100 in market value of the bond is convertible into two shares and the current share price is $50?

A. 0.5

B. 1

C. 0

D. None of the above

ANSWER: C

Explanation:

:

Since $100 is convertible into two shares, the price upon conversion per share is $50, which is the same as the current share price. Therefore there is no premium, and Choice 'c' is the correct answer.

QUESTION NO: 6

What is the coupon on a treasury bill?

A. The fed funds rate

B. The 3-month rate

C. 0%

D. Libor

ANSWER: C

Explanation:

:

Treasury bills are short-term government securities with maturities ranging from a few days to 52 weeks. Bills are sold at a discount from their face value, and do not carry a coupon.

QUESTION NO: 7

[According to the PRMIA study guide for Exam 1, Simple Exotics and Convertible Bonds have been excluded from the syllabus. You may choose to ignore this question. It appears here solely because the Handbook continues to have these chapters.]

Which of the following is not an approach to attempt to value to a convertible security:

A. DCF analysis

B. Bootstrapping

C. Lower of bond value and value of converted shares

D. Bond value plus equity option value

ANSWER: B

Explanation:

:

Bootstrapping is not one of the various approaches to try to value a convertible security.

The rest of them are, and therefore Choice 'b' is the correct answer.

QUESTION NO: 8

The annual borrowing rate for investors is 10% per annum. What is the par no-arbitrage futures price for delivery one year hence for a stock currently selling in the spot market at

$100 ? Assume the stock pays no dividends.

A. $110

B. $100

C. $105

D. $90

ANSWER: A

Explanation:

:

The no-arbitrage futures price for the stock is the current spot price plus the carrying cost for one year, which in this case is $100 * 10% =$10. Therefore the no-arbitrage futures price for the stock is $110. ($100*(1+10%), or $100 + $10.)

QUESTION NO: 9

Which of the following is NOT an assumption underlying the Black Scholes Merton option valuation formula:

A. There are no transaction costs

B. There is no credit risk

C. Volatility of the underlying and the risk free interest rate is constant

D. The option can be exercised at any time up to expiry

ANSWER: D

Explanation:

:

All the choices listed are valid assumptions underlying the BSM option valuation formula except that the BSM formula is based upon the option being exercisable only at expiry. The assumption is that early exercise is not permitted. In other words, BSM applies to European options and not American options. Therefore Choice 'd' represents the correct answer as it is not an assumption underlying Black Scholes.

QUESTION NO: 10

If the current stock price is $100, the risk-free rate of interest is 10% per year, and the value of a put option expiring in 1 year on this stock at a strike price of $110 is $5. What is the value of the call option with the same strike?

A. $5

B. $15

C. $4.55

D. $10

ANSWER: A

Explanation:

:

We can use the put-call parity to estimate the value of the call option in this case. The put-call parity can be expressed as:

Value of call - Value of put = Spot price - Exercise price discounted to the present Substituting the values we know:

Value of call - $5 = $100 - $110/(1 + 10%); which implies the value of a call is also $5.

Choice 'a' is therefore the correct answer.

Note about interest rates: How do we know if the interest rate provided in the question is continuous or discrete? For short periods of time, the difference between discrete and continuous exchange rates tends to be not material. For ease of computation, use discrete rates (as above), and it should allow you to answer the question.

QUESTION NO: 11

Credit derivatives can be used for:

I. Reducing credit exposures

II. Reducing interest rate risks

III. Earn credit risk premiums

IV. Get market exposure without taking cash market positions

A. II, III and IV

B. I, III and IV

C. I and IV

D. I, II and III

E. Reducing credit exposures

II. Reducing interest rate risks

III. Earn credit risk premiums

IV. Get market exposure without taking cash market positions

ANSWER: B

Explanation:

:

Credit derivatives can indeed be used for reducing credit exposures, earning credit risk premiums and getting market exposure without taking cash market positions. They cannot be used for reducing interest rate risks, as they pay out only when agreed 'credit events' take place. Changes in interest rates are not a credit event. Therefore Choice 'b' is the correct answer.

QUESTION NO: 12

A zero coupon bond matures in 5 years and is yielding 5%. What is its modified duration?

A. 5.25

B. 4

C. 5

D. 4.76

ANSWER: D

Explanation:

:

A zero coupon bond has a Macaulay duration equal to its maturity, ie in this case 5 years. We can calculate modified duration from Macaulay duration by using the following relationship:

Modified duration = Macaulay duration/(1 + y) where y is the yield.

Therefore the correct answer is 5 / (1.05) = 4.76.

Or intuitively, all the other answers appear clearly incorrect: 5 and 5.25 are too high, and 4 is too low. Therefore the only reasonable choice is 4.76.

QUESTION NO: 13

If r be the yield of a bond, which of the following relationships is true:

A. - Modified Duration / (1 + r) = Macaulay Duration

B. - Modified Duration x (1 + r) = Macaulay Duration

C. Modified Duration x (1 + r) = Macaulay Duration

D. Modified Duration / (1 + r) = Macaulay Duration

ANSWER: C

Explanation:

:

To calculate the Modified Duration from Macaulay's duration, we use the relationship MD = D/(1+r), where MD is the modified duration and D the Macaulay Duration. Therefore Choice 'c' is the correct answer.

QUESTION NO: 14

What is the fair price for a bond paying annual coupons at 5% and maturing in 5 years.

Assume par value of $100 and the yield curve is flat at 6%.

A. $104.33

B. $95.79

C. $100.00

D. $94.73

ANSWER: B

Explanation:

:

The coupon payments can be considered an annuity which can be valued using the formula for the PV of annuities= annuity . Therefore the value of the five coupon payments is 5 * ((1-1/(1.06^5))/0.06) = $21.06

Similarly the principal payment at the end of 5 years can be valued as 100/1.065 = $74.73 Therefore the total value of the bond today is $95.79

QUESTION NO: 15

An asset manager holds an equity portfolio valued at $25m with a beta of 0.8. She would like to reduce the beta of the portfolio to 0.6 for the next 3 months using index futures. Index futures are curently trading at 1450, and the contract multiple is 250. How should the asset manager trade the index futures to get his desired result? Assume her portfolio is well diversified.

A. Sell 35 index futures contracts

B. Sell 55 index futures contracts

C. Buy 25 index futures contracts

D. Sell 14 index futures contracts

ANSWER: D

Explanation:

:

The portfolio's beta is 0.8, and therefore in order to completely hedge the portfolio (ie reduce beta to 0), the portfolio manager would need to short 0.8 * $25m/(1450*$250) = 55.17 contracts, or 55 contracts. However, the ask here is to reduce the beta to 0.6, and not 0.

The number of contracts required to reduce the beta of a portfolio from to is give by (-) * Value of portfolio / Value of a single contract. In this case, this calculation works out to (0.8 - 0.6) * $25m/(1450*250) = 13.8, or roughly 14 contracts.

The portfolio manager should short 14 index futures contracts to reduce the total portfolio beta to 0.6.