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Question 1

Question Type: MultipleChoice

Credit risk in the case of a CDO (Collateralized Debt Obligation) is borne by:

Options:

A- The sponsoring institution

B- Investors

C- The reference entity

D- The Special Purpose Vehicle (SPV)

Answer:

B

Explanation:

Investors in CDOs bear credit risk. The SPV is merely a conduit that owns the underlying assets on which the sponsoring institution has bought protection. The investors have sold them this protection, and are on the hook for defaults or other credit events. The reference entity is relevant only to CDSs, not CDOs. Choice 'b' is the correct answer.

Question 2

Question Type: MultipleChoice

Which of the following are considered Credit Events under ISDA definitions?

1. Bankruptcy

II. Obligation Acceleration

III. Obligation Default

IV. Restructuring

Options:

A- II and IV

B- I, II, III and IV

C- I and IV

D- I, III and IV

Answer:

B

Explanation:

According to ISDA, a credit event is an event linked to the deteriorating credit worthiness of an underlying reference entity in a credit derivative. The occurrence of a credit event usually triggers full or partial termination of the transaction and a payment from protection seller to protection buyer. Credit events include

- bankruptcy,

- failure to pay,

- restructuring,

- obligation acceleration,

- obligation default and

- repudiation/moratorium.

Therefore all four events listed are credit events and Choice 'b' is the correct answer.

Question 3

Question Type: MultipleChoice

Credit derivatives can be used for:

1. Reducing credit exposures

II. Reducing interest rate risks

III. Earn credit risk premiums

IV. Get market exposure without taking cash market positions

Options:

A- II, III and IV

B- I, III and IV

C- I and IV

D- I, II and III

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 4

Question Type: **MultipleChoice**

Which of the following are valid credit enhancements used for credit derivatives:

1. Overcollateralization

II. Excess spread

III. Cash reserves

IV. Margin requirements

Options:

A- I, II and IV

B- II, III and IV

C- I, II and III

D- I, II, III and IV

Answer:

C

Explanation:

Overcollateralization is when the notes issued by the special purpose vehicle are less in value compared to the underlying pool of assets, thereby providing a buffer to absorb losses. Excess spread implies that the notes issued carry a lower interest rate than the interest rate received on the underlying assets. Cash reserves are reserves intended to take first hits when losses happen. All of these are valid credit enhancements for structured products. Additionally, 'insurance wraps' are also used as a credit enhancement. Choice 'c' is the correct answer.

'Margin requirements' do not mean anything in this context and are not a valid credit enhancement used for credit derivatives.

Question 5

Question Type: MultipleChoice

The most risky tranche of a structured credit derivative is called:

Options:

A- the risky tranche

B- the senior tranche

C- the equity tranche

D- the mezzanine tranche

Answer:

C

Explanation:

The riskiest tranche of a structured product is called the equity tranche. All other choices are incorrect.

Question 6

Question Type: MultipleChoice

Which of the following statements are true:

1. A credit default swap provides exposure to credit risk alone and none to credit spreads

II. A CDS contract provides exposure to default risk and credit spreads

III. A TRS can be used as a funding source by the party paying LIBOR or other floating rate

IV. A CLN is an unfunded security for getting exposure to credit risk

Options:

A- I, III and IV

B- II, III and IV

C- II and IV

D- II and III

Answer:

D

Explanation:

A CDS contract provides exposure to default risk and the credit spread for a particular credit. It does not provide an exposure to the risk of interest rates going up or down. It is an instrument that allows institutions to take a view on the price of credit risk alone. Therefore statement I is false and statement II is true.

A total return swap (TRS) exchanges the return from an asset for a fixed or floating exchange rate. It is in essence a financing arrangement where one party pays the other interest to earn a return on an asset that it does not wish to hold itself, perhaps for liquidity reasons. The financed asset is held by the party paying the asset's returns, effectively creating a 'collateral'. Therefore statement III is correct.

A credit linked note is a funded instrument where the sellers of the protection have put up the money upfront in the form of a subscription to a note in case the credit losses are realized. Therefore statement IV is not correct.

Question 7

Question Type: **MultipleChoice**

Which of the following relationships are true:

1. Delta of Put = Delta of Call - 1

II. Vega of Call = Vega of Put

III. Gamma of Call = Gamma of Put

IV. Theta of Put > Theta of Call

Assume dividends are zero.

Options:

A- I, II, III and IV

B- II and IV

C- I and III

D- I, II and III

Answer:

A

Explanation:

All the statements are correct, and represent the relationships between the values of the Greek variables for calls and puts for the same option. It is important to know why as the PRM exam often asks tough questions about the Greeks.

Statement I is correct because of the put-call parity. According to the put-call parity,

Value of call - Value of put = Spot price - Exercise price discounted to the present

Now the delta of the spot is 1, and that of the discounted price is zero. Therefore

Delta of Call - Delta of Put = 1 - 0, or by rearranging we get the equation in statement I.

Statements II and III are correct as the gamma and vega of both the spot price and the discounted price are zero. Therefore using the put-call parity, we can say

Gamma of Call - Gamma of Put = 0 - 0, and

Vega of Call - Vega of Put = 0 - 0

Rearranging, we get statements II and III.

Statement IV is correct because of the following relationship between theta of call and theta of put:

Theta of Put = Theta of Call + rKe^(-rt).

Since rKe^(-rt) can only be a positive number, theta of put can only exceed the theta of a call. However, since theta is generally negative, it often implies that the theta of a call is the larger absolute number.

Additional explanation for the last point: Assume rKe^(-rt) =+1 and theta of a put is -5 (completely hypothetical)

Now Theta of Put = Theta of Call + rKe^(-rt)

Ie -5 = -6 + 1

Now -5 is the larger number than -6. In other words, theta of put exceeds that of the call in a pure mathematical sense, which is what I mean when I say "theta of put can only exceed the theta of call". But if you ignore the sign, then theta of call is larger at 6 when compared to 5. Therefore the theta of the put is greater than the theta of the call -- which is what the answer says.

Question 8

Question Type: MultipleChoice

For a stock that does not pay dividends, which of the following represents the delta of a futures contract?

Options:

A- 0

B- e^(rt)

C- 1

D- Futures contracts do not have a delta as they are not options

Answer:

B

Explanation:

The delivery price of a futures contract is given by Se^(rt), just as in the case of a forward contract. However, a key difference is that a forward is settled at maturity whereas a futures contract pays out the P&L daily. So if the spot price increases from S to S, the holder of a futures contract immediately receives the change in the delivery price without any discounting to the present. That is, the holder of the futures contract receives (S + S)e^(rt) - Se^(rt) = Se^(rt) right away. Therefore the delta of a futures contract is e^rt, which given positive non-zero values of r and t can only be greater than zero.

Therefore Choice 'b' is the correct answer. Note the difference from a forward contract where this difference is not received till the delivery date, therefore making the delta of the forward contract to be equal to 1.

Question 9

Question Type: **MultipleChoice**

What is the delta of a forward contract on a non-dividend paying stock?

Options:

A- Forward contracts do not have a delta

B- 0

C- Less than 1 but greater than zero

D- 1

Answer:

D

Explanation:

A forward contract is a derivative contract, and has a delta of 1. Therefore Choice 'd' is the correct answer. This is because the value of a forward contract is given by S - Ke^(-rt), where S is the current spot price, r the risk free rate, K the forward price, and t the time to maturity. As S changes from S to (S + S), the value changes to (S + S) - Ke^(-rt), ie the change in value is exactly S in response to a change in the price of the underlying by S. Therefore the forward contract has a delta of 1.

All other choices are incorrect.

Note that this is different from the delta of a futures contract which is different from 1, and equal to e^(rt), a number greater than 1.

Question 10

Question Type: MultipleChoice

Which of the following statements are true:

1. For a delta neutral portfolio, gamma and theta carry opposite signs

II. The sum of the absolute value of gamma for a call and a put for the same option is 1

III. A large positive gamma is desirable in a delta neutral portfolio

IV. A trader needs at least two separate tradeable options to simultaneously make a portfolio both gamma and vega neutral

Options:

A- II and IV

B- I and II

C- III and IV

D- I, III and IV

Answer:

D

Explanation:

Statement I is true. Consider the Black Scholes PDE 202.23.e1

and substitute delta = 0 (as this is a delta neutral portfolio), and we get the result 202.23.e.

Since r is generally small, and and S are positive, theta will be negative when gamma is positive and vice versa.

Statement II is incorrect. The gamma of a call and a put are equal and do not add to 1. The relationship described applies to delta, and not gamma.

Statement III is correct because positive gamma means that the portfolio gains both from an increase and a decrease in the value of the underlying, given delta neutrality. (Generally, a positive gamma is a good thing, but like everything else, it does not come free. A trader can choose to keep their portfolio gamma positive, but in doing so he or she would be giving up premiums from options they would have sold to neutralize the gamma.)

Statement IV is correct because the only way to hedge gamma and vega is through other options positions as only options have gamma and vega. If only one tradeable option is available, it would be possible to hedge either the gamma or the vega, but not both, as achieving neutrality in one will upset the neutrality of the other. The only way to simultaneously hedge the two would be to use two different options on the underlying, and determine the number of options to be traded (using a system of simultaneous equations).

Question 11

Question Type: **MultipleChoice**

Which of the following portfolios would require rebalancing for delta hedging at a greater frequency in order to maintain delta neutrality?

Options:

A- A portfolio with a low delta and high vega

B- A portfolio with a high gamma

C- A portfolio with a high delta and low gamma

D- A portfolio with a low gamma

Answer:

B

Explanation:

A portfolio loses its delta neutrality if the delta of the portfolio changes but the underlying hedge is unchanged. The portfolio that will require the most rebalancing will be one whose delta changes by larger amounts in response to a given change in the price of the underlying. The sensitivity of the changes in delta in response to changes in the price of the underlying is measured by gamma. The higher the gamma, the more the portfolio will go out of delta neutrality given a change in the price of the underlying. Therefore Choice 'b' is the correct answer.

A portfolio with a low gamma will maintain its delta over a larger price range for the underlying, and is therefore likely to require less frequent rebalancing. The absolute level of the delta itself does not matter, what matters is the gamma. Vega is irrelevant to the delta hedging decision. Therefore the other choices are incorrect.