

Reading 76**OPTION REPLICATION USING
PUT-CALL PARITY**

1. (B) a risk-free bond.

Explanation

A synthetic European call option consists of a long position in the underlying asset, a long position in a European put option, and a short position in a risk-free bond (i.e., borrowing at the risk-free rate).

(Module 76.1, LOS 76.a)

2. (B) sell the call option.

Explanation

Put-call parity indicates that $P = C + PV(X) - S$. With $P < [C + PV(X) - S]$, the arbitrage transaction is to buy the put and sell the call, borrow the PV of the exercise price (X), and buy the stock

(Module 76.1, LOS 76.a)

3. (A) a call option and a bond that pays the exercise price of the call at option expiration.

Explanation

A fiduciary call combines a call option and a bond that pays the exercise price of the call at option expiration.

(Module 76.1, LOS 76.a)

4. (A) short the stock, long the call, and long a pure discount bond that pays the exercise price at option expiration.

Explanation

A short position in the stock combined with a long call and lending the present value of the exercise price will replicate the payoffs on a put at option expiration.

(Module 76.1, LOS 76.a)

5. (C) long the stock, long the put, and short a pure discount bond that pays the exercise price at option expiration.

Explanation

A stock and a put combined with borrowing the present value of the exercise price will replicate the payoffs on a call at option expiration.

(Module 76.1, LOS 76.a)

6. (A) writing the call option and buying the put option**Explanation**

The put-call-forward parity relationship may be expressed as:

$$p_0 - c_0 = [X - F_0(T)] (1 + Rf)^{-T}$$

That is, at initiation of a forward contract on the underlying asset, buying a put option and writing a call option with exercise price X will have the same cost as a risk-free bond which, at expiration of the forward and options, will pay the difference between X and the forward price.

(Module 76.1, LOS 76.b)

7. (A) the underlying asset.**Explanation**

A synthetic European put option consists of a long position in a European call option, a long position in a risk-free bond that pays the exercise price on the expiration date, and a short position in the underlying asset.

(Module 76.1, LOS 76.a)

8. (B) Long call option, long risk-free bond.**Explanation**

The put-call parity relationship shows that a protective put (long put, long underlying asset) has the same future payoff as a fiduciary call (long call, long risk-free bond).

(Module 76.1, LOS 76.a)

9. (B) The present value of the forward price of the underlying asset.**Explanation**

The put-call-forward parity relationship is: $F_0(T) / (1 + RFR)^T + p = c + X / (1 + RFR)^T$, where $F_0(T)$ is the forward price of the underlying asset.

(Module 76.1, LOS 76.a)

10. (B) the value of a put option at X plus the present value of the forward contract price.**Explanation**

The put-call-forward parity relationship is:

$$c_0 + X(1 + Rf)^{-T} = p_0 + F_0(T)(1 + Rf)^{-T}$$

The value of a call at X plus the present value of X is equal to the value of a put option at X plus the present value of the forward contract price.

(Module 76.1, LOS 76.b)

