Chapter 7: Option pricing in discrete time

Self test questions

1. An American put option is a financial contract that gives its buyer the right to:

   (a) Buy something on a pre-specified date
   (b) Sell something on a pre-specified date
   (c) Buy something before a pre-specified date
   (d) Sell something before a pre-specified date

2. The buyer of a call option has the:

   (a) Right to buy something
   (b) Right to sell something
   (c) Obligation to buy something
   (d) Obligation to sell something

3. The seller of a call option has the:

   (a) Right to buy something
   (b) Right to sell something
   (c) Obligation to buy something
   (d) Obligation to sell something

4. The buyer of a put option has the:

   (a) Right to buy something
   (b) Right to sell something
   (c) Obligation to buy something
   (d) Obligation to sell something

5. The seller of a put option has the:

   (a) Right to buy something
   (b) Right to sell something
   (c) Obligation to buy something
   (d) Obligation to sell something

6. What position do the buyer and seller hold in the option?

   (a) The buyer of a call holds a ☐ Long position ☐ Short position
   (b) The seller of a call holds a ☐ Long position ☐ Short position
   (c) The buyer of a put holds a ☐ Long position ☐ Short position
   (d) The seller of a put holds a ☐ Long position ☐ Short position

7. If the exercise price of a call option on a stock is lower than the stock price, then the option is:

   (a) In the money
   (b) At the money
   (c) Out of the money

8. If the exercise price of a put option on a stock is higher than the stock price, then the option is:

   (a) In the money
   (b) At the money
   (c) Out of the money

9. Under which condition does a long position in a call option on a stock break even if it is exercised?

   (a) The stock price equals the exercise price
   (b) The stock price equals the exercise price plus the option premium
   (c) The stock price equals the exercise price plus the future value of the option premium

10. The maximum loss of a long position in a call is:

    (a) Unlimited
    (b) The exercise price
    (c) The option premium
    (d) None of the above

11. The maximum loss of a short position in a call is:

    (a) Unlimited
    (b) The exercise price
    (c) The option premium
    (d) None of the above

12. The maximum loss of a long position in a put is:

    (a) Unlimited
    (b) The exercise price
    (c) The option premium
    (d) None of the above

13. The maximum loss of a short position in a put is:

    (a) Unlimited
    (b) The exercise price
    (c) The option premium
    (d) None of the above

14. The maximum profit of a long position in a call is:

    (a) Unlimited
    (b) The exercise price
    (c) The option premium
    (d) None of the above

15. The maximum profit of a short position in a call is:

    (a) Unlimited
    (b) The exercise price
    (c) The option premium
    (d) None of the above

16. The maximum profit of a long position in a put is:

    (a) Unlimited
    (b) The exercise price
    (c) The option premium
    (d) None of the above

17. The maximum profit of a short position in a put is:

    (a) Unlimited
    (b) The exercise price
    (c) The option premium
    (d) None of the above

18. What does the put-call parity say?

    (a) Long put + PV(X) = long call + share
    (b) Share - long put = long call - PV(X)
    (c) Long put + long call = share -PV(X)
    (d) None of the above

19. The price of a European call option on a stock cannot be higher than:

    (a) The stock price
    (b) The present value of the stock price
    (c) The exercise price
    (d) The present value of the exercise price

20. The price of an American call option on a stock cannot be higher than:

    (a) The stock price
    (b) The present value of the stock price
    (c) The exercise price
    (d) The present value of the exercise price

21. The price of a European put option on a stock cannot be higher than:

    (a) The stock price
    (b) The present value of the stock price
    (c) The exercise price
    (d) The present value of the exercise price

22. The price of an American put option on a stock cannot be higher than:

    (a) The stock price
    (b) The present value of the stock price
    (c) The exercise price
    (d) The present value of the exercise price

23. The price of a call option:

    (a) Increases with exercise price
    (b) Is independent of the exercise price
    (c) Decreases with the exercise price

24. The price of a put option:

    (a) Increases with exercise price
    (b) Is independent of the exercise price
    (c) Decreases with the exercise price

25. What is a state security?

    (a) A security that pays off 1 in all states
    (b) A security that pays off 1 in some states and 0 in all other states
    (c) A security that pays off 1 in only one state and 0 in all other states

26. What does a state price reflect?

    (a) The real probability that the state occurs ☐ True ☐ False
    (b) The risk neutral probability that the state occurs ☐ True ☐ False
    (c) The marginal utility of money in the state ☐ True ☐ False
    (d) The degree of risk aversion in the market ☐ True ☐ False

27. In state-preference theory, if a market is complete then:

(a)	In every state there is at least one security that has a payoff	☐ True	☐ False
(b)	State securities can be constructed for all states	☐ True	☐ False
(c)	New, non-redundant securities can be constructed	☐ True	☐ False
(d)	The existing securities span all the states	☐ True	☐ False

28. In state-preference theory, if a market is arbitrage free then:

(a)	No arbitrage opportunities exist	☐ True	☐ False
(b)	No new, non-redundant securities can be constructed	☐ True	☐ False
(c)	No security or combination of securities dominates another	☐ True	☐ False
(d)	The existing securities span all the states	☐ True	☐ False

29. Risk neutral valuation says that the value of a risky asset can be calculated as:

(a) The expected payoff, calculated with the real probabilities, discounted at a risk adjusted rate

(b) The expected payoff, calculated with the risk neutral probabilities, discounted at a risk adjusted rate

(c) The expected payoff, calculated with the real probabilities, discounted at a risk free rate

(d) The expected payoff, calculated with the risk neutral probabilities, discounted at a risk free rate

30. Under the risk neutral probability measure in complete and arbitrage free markets:

(a)	The expected return of all assets is the risk free interest rate	☐ True	☐ False
(b)	All asset prices are martingales	☐ True	☐ False
(c)	All properly discounted asset prices are martingales	☐ True	☐ False
(d)	All investors are assumed to be risk neutral	☐ True	☐ False

31. In the risk neutral valuation approach:

(a)	Risk neutral probabilities are discounted state prices	☐ True	☐ False
(b)	State prices are discounted risk neutral probabilities	☐ True	☐ False
(c)	Risk neutral probabilities are compounded state prices	☐ True	☐ False
(d)	Risk neutral probabilities are standardized (i.e. divided by their sum) state prices	☐ True	☐ False

32. In the binomial model, the market is complete if:

(a) Risk free debt is traded

(b) A risky security is traded

(c) Two linearly independent securities are traded

(d) None of the above

33. In the binomial model, the no arbitrage condition is:

(a) $r = u = d$

(b) $r < d < u$

(c) $d < r < u$

(d) $d < u < r$