Student name:\_\_\_\_\_\_\_\_\_\_

**MULTIPLE CHOICE - Choose the one alternative that best completes the statement or answers the question.  
1)** The process that ensures that two securities positions with identical future payoffs, regardless of future events, will have the same price is called:

1) \_\_\_\_\_\_

A) the law of one price.   
 B) arbitrage.  
 C) exchange parity.

**2)** When interest rates and futures prices for an asset are uncorrelated and forwards are less liquid than futures, it is *most likely* that the price of a forward contract is:

2) \_\_\_\_\_\_

A) equal to the price of a futures contract.   
 B) greater than the price of a futures contract.  
 C) less than the price of a futures contract.

**3)** An analyst determines that a portfolio with a 35% weight in Investment P and a 65% weight in Investment Q will have a standard deviation of returns equal to zero.  
 ● Investment P has an expected return of 8%.  
 ● Investment Q has a standard deviation of returns of 7.1% and a covariance with the market of 0.0029.  
 ● The risk-free rate is 5% and the market risk premium is 7%.  
   
 If no arbitrage opportunities are available, the expected rate of return on the combined portfolio is *closest to*:

3) \_\_\_\_\_\_

A) 7%.   
 B) 6%.  
 C) 5%.

**4)** Which of the following is an example of an arbitrage opportunity?

4) \_\_\_\_\_\_

A) A stock with the same price as another has a higher rate of return.   
 B) A portfolio of two securities that will produce a certain return that is greater than the risk- free rate of interest.  
 C) A put option on a share of stock has the same price as a call option on an identical share.

**5)** MBT Corporation recently announced a 15% increase in earnings per share (EPS) over the previous period. The consensus expectation of financial analysts had been an increase in EPS of 10%. After the earnings announcement the value of MBT common stock increased each day for the next five trading days, as analysts and investors gradually reacted to the better than expected news. This gradual change in the value of the stock is an example of:

5) \_\_\_\_\_\_

A) efficient markets.   
 B) inefficient markets.  
 C) speculation.

**6)** The spot price of an asset is 62 and the risk-free rate is 2.5%. If the net cost of carry for the asset over the next six months is −3 in present value terms, the no-arbitrage 6-month forward price is *closest* to:

6) \_\_\_\_\_\_

A) 66.6   
 B) 65.8  
 C) 59.7

**7)** It is possible to profit from arbitrage when there are no costs or benefits to holding the underlying asset and the forward contract price is:

7) \_\_\_\_\_\_

A) greater than the present value of the spot price.   
 B) less than the future value of the spot price.  
 C) less than the present value of the spot price.

**8)** A net benefit from holding the underlying asset of a forward contract will:

8) \_\_\_\_\_\_

A) decrease the value of the forward contract at expiration.   
 B) increase the value of the forward contract during its life.  
 C) decrease the no-arbitrage forward price at initiation.

**9)** Bea Moran wants to establish a long derivatives position in a commodity she will need to acquire in six months. Moran observes that the six-month forward price is 45.20 and the six-month futures price is 45.10. This difference *most likely* suggests that for this commodity:

9) \_\_\_\_\_\_

A) there is an arbitrage opportunity among forward, futures, and spot prices.   
 B) futures prices are negatively correlated with interest rates.  
 C) long investors should prefer futures contracts to forward contracts.

**10)** Derivatives valuation is based on risk-neutral pricing because:

10) \_\_\_\_\_\_

A) this method provides an intrinsic value to which investors apply a risk premium.   
 B) the risk of a derivative is based entirely on the risk of its underlying asset.  
 C) risk tolerances of long and short investors are assumed to offset.

**11)** Which of the following is the *best* interpretation of the no-arbitrage principle?

11) \_\_\_\_\_\_

A) The information flow is quick in the financial market.   
 B) There is no way you can find an opportunity to make a profit.  
 C) There is no free money.

**12)** Which of the following statements about arbitrage opportunities is *most accurate*?

12) \_\_\_\_\_\_

A) Engaging in arbitrage requires a large amount of capital.   
 B) The market prices of two assets or portfolios that have the same future payoffs cannot differ for protracted periods.  
 C) Arbitrage is referred to as the law of one price.

**13)** The price of a pay-fixed receive-floating interest rate swap is:

13) \_\_\_\_\_\_

A) determined by expected future short-term rates.   
 B) negative when floating rates are highly volatile.  
 C) zero when floating rates and fixed rates are equal.

**14)** Compared to European put options on an asset, otherwise identical American put options on the asset are *most likely* to be more valuable if:

14) \_\_\_\_\_\_

A) the asset value is significantly lower than the exercise price.   
 B) the options are out-of-the-money.  
 C) the asset pays dividends during the life of the option.

**15)** The calculation of derivatives values is based on an assumption that:

15) \_\_\_\_\_\_

A) arbitrage opportunities do not arise in real markets.   
 B) arbitrage opportunities are exploited rapidly.  
 C) investors are risk neutral.

**16)** For two European put options that differ only in their time to expiration, which of the following is *most* accurate? The longer-term option:

16) \_\_\_\_\_\_

A) is worth at least as much as the shorter-term option.   
 B) is worth more than the shorter-term option.  
 C) can be worth less than the shorter-term option.

**17)** Which of the following portfolios has the same future cash flows as a protective put?

17) \_\_\_\_\_\_

A) Long call option, long risk-free bond, short the underlying asset.   
 B) Long call option, long risk-free bond.  
 C) Short call option, long risk-free bond.

**18)** For a European style put option:

18) \_\_\_\_\_\_

A) exercise value is equal to the underlying stock price minus its exercise price.   
 B) intrinsic value is equal to its market price plus its exercise value.  
 C) time value is equal to its market price minus its exercise value.

**19)** The time value of a European call option with 30 days to expiration will *most likely* be:

19) \_\_\_\_\_\_

A) less than the current option premium if the option is currently in-the-money.   
 B) equal to the intrinsic value if the exercise price is greater than the current spot price.  
 C) greater than the current option premium if the option is currently out-of-the-money.

**20)** The value of a European put option at expiration is *most likely* to be increased by:

20) \_\_\_\_\_\_

A) a lower risk-free interest rate.   
 B) a higher exercise price.  
 C) higher volatility of the underlying asset price.

**21)** Other things equal, a short put position would become more valuable as a result of an increase in:

21) \_\_\_\_\_\_

A) the price of the underlying asset.   
 B) the volatility of the price of the underlying asset.  
 C) the time to expiration.

**22)** The time value of an option is *most accurately* described as:

22) \_\_\_\_\_\_

A) increasing as the option approaches its expiration date.   
 B) the amount by which the intrinsic value exceeds the option premium.  
 C) equal to the entire premium for an out-of-the-money option.

**Answer Key**Test name: Derivatives

1) B

If two securities have identical payoffs regardless of events, the process of arbitrage will move prices toward equality. Arbitrageurs will buy the lower priced position and sell the higher priced position, for an immediate profit without any future liability. The law of one price (for securities with identical payoffs) is not a process; it is ‘enforced’ by arbitrage.

2) A

When interest rates and futures prices are uncorrelated the prices of forward and futures on the same asset will be equal. Liquidity is not an issue as no-arbitrage prices are based on riskless hedges that are held until settlement of the derivative security.

3) C

If the no-arbitrage condition is met, a riskless portfolio (a portfolio with zero standard deviation of returns) will yield the risk-free rate of return.

4) B

An arbitrage opportunity exists when a combination of two securities will produce a certain payoff in the future that produces a return that is greater than the risk-free rate of interest. Borrowing at the riskless rate to purchase the position will produce a certain future amount greater than the amount required to repay the loan.

5) B

A critical element of efficient markets is that asset prices respond immediately to any new information that will affect their value. Large numbers of traders responding in similar fashion to the new information will create a temporary imbalance in supply and demand, and this will adjust asset market values.

6) B

F0(T) = [S0 − net cost of carry] × (1 + Rf)T = [62 − (−3)] × (1.025)6/12 = 65.81

7) B

An opportunity for arbitrage exists if the forward price is not equal to the future value of the spot price, compounded at the risk-free rate over the period of the forward contract.

8) C

Compared to an underlying asset with no net holding cost or benefit, a net benefit from holding the underlying asset will decrease the no-arbitrage forward price at initiation and the value of a forward contract during its life. Holding costs and benefits have no effect on the value of a forward contract at expiration.

9) B

Differences may exist between forward and futures prices for otherwise identical contracts if futures prices are correlated with interest rates. If futures prices are negatively correlated with interest rates, daily settlement of long futures contracts will require cash when interest rates are increasing and produce cash when interest rates are decreasing. As a result the futures price will be lower than the forward price. The difference in price does not provide an arbitrage opportunity or suggest that investors should prefer forward or futures contracts.

10) B

Because the risk of a derivative is based entirely on the risk of its underlying asset, we can construct a perfectly hedged portfolio of a derivative and its underlying asset. The future payoff of a perfectly hedged position is certain and can therefore be discounted at the risk-free rate.

11) C

An *arbitrage opportunity* is the chance to make a riskless profit with no investment. *In essence, finding an arbitrage opportunity is like finding free money.* As you recall, in arbitrage, you observe two identical assets with different prices. Your immediate response should be to buy the cheaper one and sell the expensive one short. You can then deliver the cheap one to cover your short position. Once you take the initial arbitrage position, your arbitrage profit is locked in. The *no-investment statement* referenced in the text refers to the assumption that when you short the expensive asset, you will be given access to the cash created by the short sale. With this cash, you now have the money to buy the cheaper asset. The no-investment assumption means that the first person to observe a market pricing error will have the financial resources to correct the pricing error instantaneously all by themselves.

12) C

Arbitrage is often referred to as the law of one price. Because when exploiting an arbitrage opportunity an arbitrageur will often simultaneously sell the higher-priced asset and buy the lower-priced asset, no capital may be required. Price differences may persist when short sales are not possible of because the difference is not great enough to outweigh the transaction costs of exploiting it.

13) A

The price of an interest rate swap refers to the fixed rate specified in the swap. This price is calculated as a function of expected future short-term rates.

14) A

Early exercise of an in-the-money American put option is valuable when the asset value is significantly below the exercise price (i.e. they are deep in-the money). The payment of interest or dividends from the underlying asset increases put values, so it does not make early exercise valuable as it does with call options.

15) B

Derivatives valuation is based on the assumption that any arbitrage opportunities in financial markets are exploited rapidly so that assets with identical cash flows are forced toward the same price. It does not assume arbitrage opportunities do not arise or that investors are risk neutral.

16) C

For European puts, it is possible that the longer term option can be less valuable than a shorter-term option.

17) B

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).

18) C

The time value of an option (either a put or a call) is equal to its market price minus its exercise value. A put's exercise value is the maximum of zero or its exercise price minus the stock price. *Intrinsic value* is another term for exercise value.

19) A

The option premium is made up of time value and intrinsic value. Intrinsic value is positive if an option is in-the-money and zero otherwise. Time value is always positive for call options. If the option still has 30 days until expiration and is in-the-money, the option premium will be the positive intrinsic value, plus the positive time value. Hence, the time value will be less than the premium.   
   
 If the option is out-of-the-money, the intrinsic value will be zero, and the option premium will be equal to the time value. If the exercise price is greater than the current spot price, the call option is out-of-the-money and hence the intrinsic value again is zero. But as the call option still has time to expiration, the time value will be positive.

20) B

The value of an option at expiration is the greater of zero or its exercise value. A higher exercise price increases the exercise value of a put option because it gives the holder the right to sell the underlying asset for a higher price. The risk-free interest rate and volatility of the underlying asset price only affect the time value of options, which is zero at expiration.

21) A

An increase in the price of the underlying asset would decrease the value of a put option, which would make a long position in the put less valuable and a short position more valuable. An increase in either the volatility of the underlying asset price or time to expiration would increase the put value and decrease the value of a short position.

22) C

The price (or premium) of an option is its intrinsic value plus its time value. An out-of-the-money option has an intrinsic value of zero, so its entire premium consists of time value. Time value is zero at an option’s expiration date. Time value is the amount by which an option's premium exceeds its intrinsic value.

1) 确保两种证券头寸在未来无论发生何种事件均具有相同回报且价格相同的流程称为：

A) 一价法则

B) 套利

C) 汇率平价

2) 当利率与资产的期货价格不相关，且远期合约的流动性低于期货合约时，远期合约的价格最有可能：

A) 等于期货合约的价格

B) 高于期货合约的价格

C) 低于期货合约的价格

3) 一位分析师确定，一个由35%的投资P和65%的投资Q组成的投资组合，其回报标准差将为零。

● 投资P的预期回报率为8%。

● 投资Q的回报标准差为7.1%，与市场的协方差为0.0029。

● 无风险利率为5%，市场风险溢价为7%。

如果不存在套利机会，该组合投资的预期回报率最接近：

A) 7%

B) 6%

C) 5%

4) 以下哪项是套利机会的例子？

A) 一只股票与另一只价格相同的股票具有更高的回报率

B) 由两种证券组成的投资组合将产生高于无风险利率的确定回报

C) 一只股票的看跌期权与相同股票的看涨期权价格相同

5) MBT公司最近宣布每股收益（EPS）较前一期增长15%。金融分析师的共识预期为EPS增长10%。在收益公布后的五个交易日，MBT普通股价值每天都在增加，因为分析师和投资者逐渐对超出预期的消息作出反应。股票价值的这种逐渐变化是以下哪项的例子：

A) 有效市场

B) 无效市场

C) 投机

6) 某资产的现货价格为62，无风险利率为2.5%。如果该资产在未来六个月的净持有成本现值为-3，无套利条件下6个月远期价格最接近：

A) 66.6

B) 65.8

C) 59.7

7) 当持有标的资产没有成本或收益时，如果远期合约价格满足以下条件，则可以通过套利获利：

A) 高于现货价格的现值

B) 低于现货价格的未来值

C) 低于现货价格的现值

8) 持有远期合约标的资产的净收益将：

A) 降低远期合约在到期时的价值

B) 提高远期合约在其存续期间的价值

C) 降低发起时的无套利远期价格

9) 比·莫兰希望在六个月后需要收购的商品上建立多头衍生品头寸。莫兰观察到六个月远期价格为45.20，六个月期货价格为45.10。这种差异最有可能表明该商品：

A) 远期、期货和现货价格之间存在套利机会

B) 期货价格与利率呈负相关

C) 多头投资者应优先选择期货合约而非远期合约

10) 衍生品估值基于风险中性定价，因为：

A) 该方法提供了投资者应用风险溢价的内在价值

B) 衍生品的风险完全基于其标的资产的风险

C) 假设多头和空头投资者的风险承受能力相互抵消

11) 以下哪项是对无套利原则的最佳解释？

A) 金融市场信息流动很快

B) 没有找到获利机会的方法

C) 没有免费的钱

12) 关于套利机会的以下哪项陈述最为准确？

A) 进行套利需要大量资本

B) 具有相同未来回报的两种资产或投资组合的市场价格不会长期存在差异

C) 套利被称为一价法则

13) 固定支付浮动利率互换的价格：

A) 由预期的未来短期利率决定

B) 当浮动利率波动较大时为负

C) 当浮动利率和固定利率相等时为零

14) 与标的资产上的欧式看跌期权相比，相同的美式看跌期权在以下情况下最有可能更有价值：

A) 资产价值远低于行权价格

B) 期权为价外期权

C) 标的资产在期权存续期间支付股息

15) 衍生品价值的计算基于以下假设：

A) 现实市场中不会出现套利机会

B) 套利机会会被迅速利用

C) 投资者是风险中性的

16) 对于仅在到期时间上不同的两个欧式看跌期权，以下哪项最为准确？较长期限的期权：

A) 价值至少与较短期限的期权相同

B) 价值高于较短期限的期权

C) 价值可能低于较短期限的期权

17) 以下哪种投资组合与保护性看跌期权的未来现金流相同？

A) 多头看涨期权、多头无风险债券、卖空标的资产

B) 多头看涨期权、多头无风险债券

C) 空头看涨期权、多头无风险债券

18) 对于欧式看跌期权：

A) 行权价值等于标的股票价格减去其行权价格

B) 内在价值等于其市场价格加上其行权价值

C) 时间价值等于其市场价格减去其行权价值

19) 距离到期还有30天的欧式看涨期权的时间价值最有可能：

A) 如果期权当前为价内期权，则低于当前期权溢价

B) 如果行权价格高于当前现货价格，则等于内在价值

C) 如果期权当前为价外期权，则高于当前期权溢价

20) 欧式看跌期权在到期时的价值最有可能因以下哪项增加：

A) 较低的无风险利率

B) 较高的行权价格

C) 标的资产价格的较高波动性

21) 在其他条件不变的情况下，空头看跌头寸的价值会因以下哪项增加而变得更有价值：

A) 标的资产价格的增加

B) 标的资产价格波动的增加

C) 到期时间的延长

22) 期权时间价值的最准确描述是：

A) 随着期权接近到期日而增加

B) 内在价值超过期权溢价的金额

C) 对于价外期权，等于整个溢价