

## 金融市场与产品

### 单项选择题

1. Today, most banks engage in both commercial and investment banking. Which of the following statements is least correct?
- A. Commercial banks involves the deposit-taking and lending activities which can be classified as retail banking or wholesale banking.
- B. Wholesale banking involves the provision of banking services to medium and large corporate clients, fund managers, and other financial institutions.
- C. Investment banking in virtually all countries has been subject to a great deal of regulation, because most of their business are very important for the national economy that individuals and companies have confidence in the banking system.
- D. The main activity of investment banking is raising debt and equity financing for corporations or governments which involves originating the securities, underwriting them and placing them with investors.

参考答案: C

**【莽学解析】**本题考查商业银行和投资银行的业务。在大部分国家里，对商业银行的监管更严格一些，因为商业银行的存贷款业务是金融行业的基础业务，对个人和公司客户都有很大影响。而对投资银行的监管政策更加宽松一些。选项C描述错误，符合题意，为正确选项。对于选项A，商业银行涉及的存贷款业务可分为零售银行业务和批发银行业务。因此，该选项描述正确，不符合题意，为错误选项。对于选项B，批发银行业务是为大中型企业客户、基金经理和其他金融机构提供银行服务的业务。因此，该选项描述正确，不符合题意，为错误选项。对于选项D，投资银行的主要活动是帮助公司或政府进行债权融资和股权融资，包括证券的发行、承销和向投资者配售。因此，该选项描述正确，不符合题意，为错误选项。

2.

The relevant interest rate for insurance contracts is 4% per annum and all premiums are paid annually at the beginning of the year. A \$7,000,000 term insurance contract is being proposed for a 30-year-old female in average health. Assume that payouts occur at the end of the year. Using the mortality rates table, which of the following amounts is closest to the insurance company's breakeven premium for a two-year term?

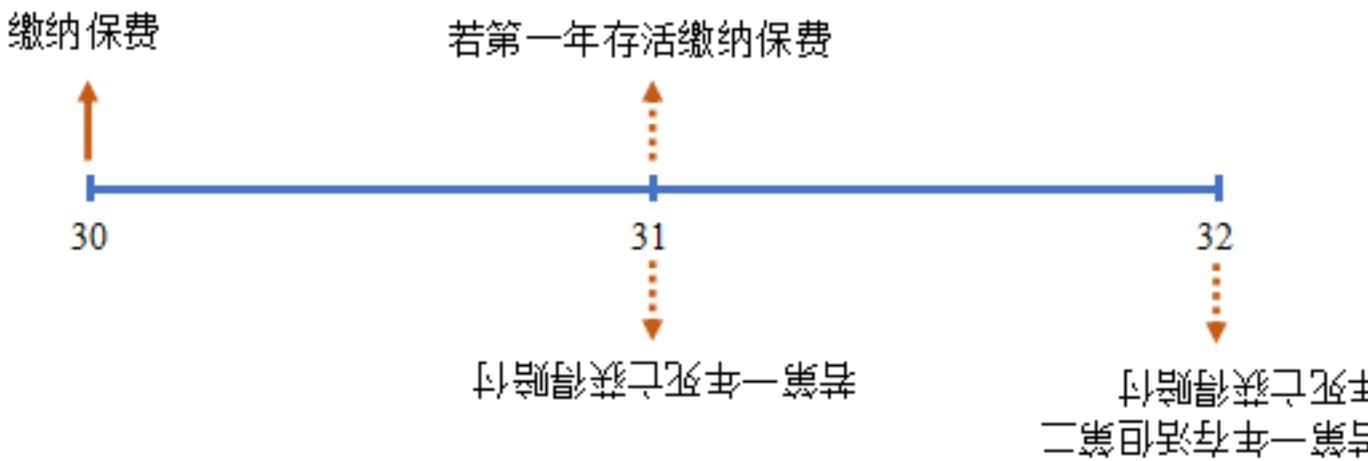
Age (Years)	Male			Female		
	Probability of Death within 1 Year	Survival Probability	Life Expectancy	Probability of Death within 1 Year	Survival Probability	Life Expectancy
30	0.001419	0.97372	47.52	0.000662	0.98551	51.82
31	0.001445	0.97234	46.59	0.000699	0.98486	50.86
32	0.001478	0.97093	45.65	0.000739	0.98417	49.89

- A. \$4677  
 B. \$4578  
 C. \$4500  
 D. \$4725

参考答案: B

**【莽学解析】**

本题考查均衡保费的计算。



解题的核心思想为  $PV_{\text{赔付}} = PV_{\text{缴纳}}$ 。

第一步，计算（死亡）收到赔付的概率：第一年（年末）死亡的概率为 0.000662；  
第一年生存并在第二年（年末）死亡的概率为：

$$(1 - 0.000662) \times 0.000699 = 0.0006985$$

第二步，计算收到赔付的期望现值：

$$\frac{0.000662 \times 7,000,000}{1 + 4\%} + \frac{(1 - 0.000662) \times 0.000699 \times 7,000,000}{(1 + 4\%)^2}$$
$$= \$8976.62799$$

第三步，计算（生存）支付保费的概率：第一年（年初）支付保费的概率为 1；  
第一年生存并在第二年（年初）支付保费的概率为：

$$1 - 0.000662 = 0.999338$$

第四步，设每期均衡保费为  $x$ ，计算支付保费的期望现值：

$$x + \frac{0.999338x}{(1 + 4\%)^1}$$

第五步，令收支期望现值相等，解出均衡保费  $x$ ：

$$x + \frac{0.999338x}{(1 + 4\%)^1} = \$8976.62799 \Rightarrow x = \$4577.805515$$

因此，选项 B 正确。

3. Darcy, a portfolio manager manages a \$10 million portfolio that has a beta of 0.3 relative to the S&P 500. The S&P 500 futures are trading at 1,050 and the multiplier is 250. He would like to use the S&P 500 futures to hedge exposure to market risk over the next few months. Suppose that at the maturity of the futures contract, the S&P 500 futures is trading at 1,000 and the portfolio has experienced a 1% decline in value. Evaluate the following statements:  
I. The appropriate hedge for the portfolio is a short position in 38 contracts.  
II. The net impact of the market decline on the appropriately hedged portfolio is a loss of \$37,500.

A. I only

- B. II only  
 C. Neither of I and II is correct  
 D. Both I and II are correct

参考答案: C

**【莽学解析】**

本题考查用期货调整组合贝塔。

对于 Statement I, 使用 S&P 500 指数期货完全对冲组合的市场风险, 即将组合贝塔值从原来的 0.3 降为 0, 所需合约份数为:

$$N = (0 - 0.3) \times \frac{10,000,000}{1050 \times 250} \approx -11$$

即卖出约 11 份期货合约, 因此该陈述错误。

对于 Statement II, 原组合的价值变动为:

$$-1\% \times 10,000,000 = -\$100,000$$

卖出的 11 份期货合约的价值变动为:

$$-11 \times (1,000 - 1,050) \times 250 = \$137,500$$

对冲后新的组合总价值变动为:

$$-100,000 + 137,500 = \$37,500$$

即盈利 37,500, 因此该陈述错误。

因此 Statement 1 和 Statement 2 均陈述错误, 选项 C 正确。

4. A portfolio management firm manages the fixed-rate corporate bond portfolio owned by a defined-benefit pension fund. The duration of the bond portfolio is five years; the duration of the pension fund's liabilities is seven years. Assume that the fund sponsor strongly believes that rates will decline over the next six months and is concerned about the duration mismatch between portfolio assets and pension liabilities. Which of the following strategies would be the best way to eliminate the duration mismatch?

- A. Enter into a swap transaction in which the firm pays fixed and receives floating.  
 B. Enter into a swap transaction in which the firm receives fixed and pays floating.  
 C. Issue a bond which has interest rate floor expiring in six months.  
 D. Sell Eurodollar futures contracts.

参考答案: B

**【莽学解析】**本题考查运用利率互换转变负债类型以及债券的久期。养老金资产端久期为5, 负债端久期为7, 资产和负债端久期均为正且不相等, 当预期接下来6个月的利率下降时, 资产端和负债端的价值均会上升, 但是由于负债端的久期更大, 价值上升更多, 会导致养老金资产小于养老金负债。进入收固定利率付浮动利率的互换, 相当于购买了固定利率债券, 出售了浮动利率债券, 而浮动利率债券的久期一般小于固定利率债券的久期, 因为浮动利率债券的久期等于重新设定票面利率的间隔时间。此利率互换会使得养老金资产端的久期上升, 实现资产端和负债端久期的匹配。因此正确选项为B。对于选项A, 进入付固定利率收浮动利率的互换, 相当于出售了固定利率债券, 购买了浮动利率债券, 此利率互换会使得养老金资产端的久期降低。

，无法实现资产端和负债端久期的匹配，因此，该选项错误。对于选项C，发行期限为6个月，具有利率下限的债券，会使得资产端的久期降低，而且具有利率下限的债券当利率下降时对发行者不利，无法实现资产端和负债端久期的匹配，因此，该选项错误。对于选项D，当利率下降时，欧洲美元期货的价格会上涨，卖出欧洲美元期货会亏损，会导致养老金资产减少，因此，该选项错误。

5.

Savers Bancorp entered into a interest rate swap agreement over a 2-year period on August 9, 2008, with which it received a 4.00% fixed rate and paid LIBOR plus 1.20% on a notional amount of USD 6.5 million. Payments were to be made every 6 months. The table below shows the actual 6-month LIBOR rates over the 2-year period.

Date	6-month LIBOR
2008, Aug 9	3.11%
2009, Feb 9	1.76%
2009, Aug 9	0.84%
2010, Feb 9	0.39%
2010, Aug 9	0.58%

Assuming no default, how much did Savers Bancorp net receive on August 9, 2010?

- A. \$72,150
- B. \$78,325
- C. \$117,325
- D. \$156,650

参考答案：B

【莽学解析】

本题考查利率互换现金流的计算。

Savers Bancorp 进入付浮动收固定的利率互换，固定利率为 4%，名义本金为 6.5 亿美元，浮动利率为 6 个月的 Libor 利率加上 1.2%，半年互换一次。Savers Bancorp 在 2010 年 8 月 9 日支出的浮动利息取决于 2010 年 2 月 9 日的 Libor 利率，Savers Bancorp 在 2010 年 8 月 9 日的支出为：

$$(0.39\% + 1.2\%) \times 0.5 \times 6,500,000 = \$51,675$$

收入为：

$$4\% \times 0.5 \times 6,500,000 = \$130,000$$

所以净收入为：

$$130,000 - 51,675 = \$78,325$$

因此，选项 B 正确。

6. A bank entered into a 5-year \$150 million annual-pay LIBOR-based interest rate swap three years ago as the fixed rate payer at 5.5%. The relevant discount rates (continuously

compounded) for 1-year and 2-year obligations are currently 5.75% and 6.25%, respectively. A payment was just made. The value of the swap is closest to:

- A. -\$2,555,860
- B. \$2,555,860
- C. \$6,450,000
- D. -\$6,450,000

参考答案: B

【莽学解析】

本题考查利率互换的估值。

这家银行为付固定利率收浮动利率的一方，其互换的价值为：

$$V_{\text{swap}} = PV_{\text{floating}} - PV_{\text{fixed}}$$

上一笔互换刚刚完成，所以处于付息时点，浮动利率债券的价值为面值。固定利率债券的价值为：

$$\begin{aligned}PV_{\text{fixed}} &= 150,000,000 \times 5.5\% \times e^{-5.75\% \times 1} \\&\quad + (150,000,000 + 150,000,000 \times 5.5\%) \times e^{-6.25\% \times 2} \\&= \$147,444,140\end{aligned}$$

互换的价值为：

$$V_{\text{swap}} = \$150,000,000 - \$147,444,140 = \$2,555,860$$

因此，选项 B 正确。

7. Which of the following statements is correct when comparing the differences between an interest rate swap and a currency swap?

- A. At maturity, the counterparties to interest rate swaps and the counterparties to currency swaps both exchange the principle of the swap.
- B. At maturity, the counterparties to interest rate swaps do not exchange the principal, but the counterparties to currency swaps exchange the value difference in principle determined by prevailing exchange rates.
- C. At maturity, the counterparties to interest rate swaps do not exchange the principal, and counterparties to currency swaps do exchange the principle.
- D. Counterparties to interest rate swaps are exposed to more counterparty credit risk due to the magnifying effect of currency, interest rate, and settlement risk embedded within the transaction.

参考答案: C

【莽学解析】本题考查利率互换和货币互换的基本特征。利率互换中交易双方在期初和期末均无需交换名义本金，而货币互换中交易双方在互换期初和期末需要交换本金。因此正确选项为C。对于选项A，利率互换在到期时无需交换名义本金。因此，该选项错误。对于选项B，利率互换在到期时无需交换名义本金，货币互换在到期时需要交换名义本金，但是名义本金是不同的货币，不是交换净额。因此，该选项错误。对于选项

D, 货币互换的交易对手方面临更大的信用风险，因为货币互换需要交换名义本金，且利息不是净额交换。因此，该选项错误。

8. On the OTC market there are two options available on Microsoft stock: a European put with premium of USD 2.25 and an American call option with premium of USD 0.46. Both options have strike price of USD 24 and an expiration date 3 months from now. Microsoft's stock price is currently at USD 22 and no dividend is due during the next 6 months. Assuming that there is no arbitrage opportunity, which of the following choices is closest to the level of the continuous compounding risk-free rate:

- A. 0.25%
- B. 1.76%
- C. 3.52%
- D. Insufficient information

参考答案: C

**【莽学解析】**

本题考查买卖权平价关系的计算。

在无股利的情况下，美式看涨期权不会提前行权，其价值等于欧式看涨期权值。运用买卖权平价关系可以求出对应的无风险利率：

$$C + Xe^{-rt} = P + S$$

代入想要的数据为：

$$0.46 + 24e^{-r \times 0.25} = 2.25 + 22$$

解出：

$$r = 3.52\%$$

因此，选项 C 正确。

9. Eric Meyers is a trader in the arbitrage unit of a multinational bank. He finds that an asset is trading at USD 1,000, the price of a 1-year forward contract on that asset is USD 1,010, and the price of a 2-year forward contract is USD 1,025. Assume that there are no cash flows from the asset for 2 years. If the term structure of interest rates is flat at 1% per year, which of the following is an appropriate arbitrage strategy? (Assume annual compounding)

- A. Short 2-year forward and long 1-year forward.
- B. Short 1-year forward and long 2-year forward.
- C. Short 2-year forward and long the underlying asset funded by borrowing for 2 years.
- D. Short 1-year forward and long the underlying asset funded by borrowing for 1 year.

参考答案: C

**【莽学解析】**

10. A 6-month futures contract on an equity index is currently priced at 1,276. The underlying index stocks are valued at 1,250 and pay dividends at a continuously compounded rate of 1.70%. The current continuously compounded risk-free rate is 5%. The potential arbitrage is closest

本题考查远期合约定价不合理时的套利。

根据无套利下远期合约的定价公式可以求出理论上一年期远期合约的价格：

$$F = 1000 \times (1 + 1\%)^1 = 1010$$

一年期远期合约的理论价格和实际价格相等，定价合理无套利机会。

两年期远期合约的理论价格为：

$$F = 1000 \times (1 + 1\%)^2 = 1020$$

两年期远期合约的实际价格大于理论价格，定价不合理，存在套利机会，属于：

$$F > S \times (1 + r)^T$$

以无风险利率借入  $S$  的资金购买现货资产，期限为两年，然后签订远期，以约定的价格  $F$  未来卖出现货资产，实现套利。因此正确选项为 C。

对于选项 A，远期定价不合理的套利是基于现货和远期的操作实现套利，而不是不同期限之间远期的操作。因此，该选项错误。

对于选项 B，远期定价不合理的套利是基于现货和远期的操作实现套利，而不是不同期限之间远期的操作。因此，该选项错误。

对于选项 D，一年期远期合约定价是合理的，无套利机会。因此，该选项错误。

to:

- A. 5. 20.
- B. 8. 32.
- C. 16. 58.
- D. 26. 00.

参考答案：A

【莽学解析】

本题考查股指期货的套利。

期限为 6 个月的股指期货市场价格为 1,276，理论价格为：

$$F = 1250 \times e^{(5\% - 1.7\%) \times 0.5} = 1,270.80$$

股指期货市场价格高于理论价格，存在套利机会，套利金额为：

$$1,276 - 1,270.80 = 5.20$$

因此，选项 A 正确。

11. It is currently August 2010, and the spot price of soybeans is \$5.05/bushel. Storage costs for soybeans on a continuously compounded basis are \$0.45/bushel annually. The appropriate

continuously compounded interest rate is 8%. If a soybean farmer has just finished harvesting his crop but would like to sell half of the crop in February 2011 and half in May 2011 by going short futures contracts, which of the following statements is most accurate? The farmer should store his crop only if the:

- A. February futures contract price is more than \$5.50/bushel and the May futures contract price is more than \$5.73/bushel.
- B. February futures contract price is more than \$5.73/bushel and the May futures contract price is more than \$5.50/bushel.
- C. February futures contract price is less than \$5.73/bushel and the May futures contract price is less than \$5.50/bushel.
- D. February futures contract price is less than \$5.50/bushel and the May futures contract price is less than \$5.73/bushel.

参考答案: D

#### 【莽学解析】

本题考查大宗商品远期和期货的定价。

一位大豆种植者刚刚收获完他的作物，准备进入期货合约的空头在2011年2月和5月分别卖出一半的作物。货合约的市场价格高于理论价格时，大豆种植者会签订期货合约将农作物卖出，因为此时会锁定一个较价，反之当期货合约的市场价格低于理论价格时，大豆种植者会储存大豆而不签订期货合约卖出。现货储成本率为：

$$u = \frac{0.45}{5.05} = 8.91\%$$

2011年2月到期的期货合约理论价格为：

$$F = 5.05 \times e^{(8\% + 8.91\%) \times 0.5} = 5.50$$

2011年5月到期的期货合约理论价格为：

$$F = 5.05 \times e^{(8\% + 8.91\%) \times 0.75} = 5.73$$

所以当2011年2月到期的期货合约市场价格低于\$5.50/bushel，2011年5月到期的期货合约市场价格低于\$5.73/bushel时，大豆种植者会储存大豆而不签订期货合约卖出。因此，选项D正确。

12. Consider a U.K. based company that exports goods to the EU. The U.K. company expects to receive payment on a shipment of goods in 60 days. Because the payment will be in euros, the U.K. company wants to hedge against a decline in the value of the euro against the pound over the next 60 days. The U.K. risk-free rate is 3% and the EU risk-free rate is 4%. No change is expected in these rates over the next 60 days. The current spot rate is EURGBP0.9230. To hedge the currency risk, the U.K. company should take a short position in a Euro contract at a forward price of (Assume annual compounding):

- A. 0.9205.
- B. 0.9215.
- C. 0.9244.
- D. 0.9141.

参考答案：B

【莽学解析】

本题考查外汇远期的定价。

即期汇率为 EURGBP 0.9230，英镑的利率为 3%，欧元的利率为 4%。2 个月的外汇远期价格为：

$$F = S \times \frac{(1 + r_{GBP})^T}{(1 + r_{EUR})^T}$$

代入数据解出：

$$F = 0.9230 \times \frac{(1 + 3\%)^{\frac{60}{365}}}{(1 + 4\%)^{\frac{60}{365}}} = 0.9215$$

因此，选项 B 正确。

13.

Samantha Fore, FRM, is examining foreign asset-liability positions that are mismatched in individual currencies at regional financial institutions. Fore is specifically looking at the overall currency exposure of the western region consisting of three banks: Mountain West, First Interstate, and Glacier Bank. Given the uncertainty in non-U.S. markets, Fore is concerned about a euro collapse.

	Mountain West	First Interstate	Glacier Bank
EUR Assets	1,350,000	500,000	875,000
EUR Liabilities	2,000,000	400,000	1,550,000
EUR payable	275,000	150,000	2,450,000
EUR receivable	650,000	375,000	1,875,000

On an aggregate basis, how would this region's euro exposure be characterized?

- A. The aggregate euro exposure faces the risk that the euro will rise in value against the domestic currency.
- B. The aggregate euro exposure faces the risk that the euro will fall in value against the domestic currency.
- C. The banks, collectively, are net long euros.
- D. The banks, collectively, are close to evenly matched and face little euro exposure.

参考答案：A

【莽学解析】本题考查外汇风险。欧元资产和欧元应收款会面临欧元贬值的风险，而欧元负债和欧元应付款会面临欧元升值的风险。

所以三家银行欧元负债和欧元应付款之和大于欧元资产和欧元应收款之和，会面临欧元升值的风险。因此正确选项为A。对于选项B，三家银行欧元负债和欧元应付款之和大于欧元资产和欧元应收款之和，会面临欧元升值的风险，而不是欧元贬值的风险。因此，该选项错误。对于选项C，三家银行欧元负债和欧元应付款之和大于欧元资产和欧元应收款之和，相当于欧元的空头方而不是多头方。因此，该选项错误。对于选项D，三家银行欧元负债和欧元应付款之和大于欧元资产和欧元应收款之和，对于欧元是有风险敞口的。因此，该选项

三家银行欧元资产总额为:

$$(1,350,000 + 500,000 + 875,000) = 2,725,000$$

三家银行欧元负债总额为:

$$(2,000,000 + 400,000 + 1,555,000) = 3,955,000$$

三家银行欧元应付款总额为:

$$(275,000 + 150,000 + 2,450,000) = 2,875,000$$

三家银行欧元应收款总额为:

$$(650,000 + 375,000 + 1,875,000) = 2,900,000$$

因为:  $2,725,000 + 2,900,000 < 3,955,000 + 2,875,000$

错误。

14. You are an institutional portfolio manager. One of your clients is very interested in the flexibility of options but expresses great concern about the high cost of some of them. In general, which of the following options would be the most costly to purchase?

- A. Barrier options
- B. Standard American options
- C. Lookback options
- D. Asian options

参考答案: C

【莽学解析】本题考查奇异期权的性质。回望期权的损益取决于期权有效期内标的资产的最高或最低价格，普通期权的损益取决于到期时标的资产的价格，所以回望期权相较于普通期权会更加灵活，期权费也更贵。因此正确选项为C。对于选项A，障碍期权在触及到障碍价后会生效或者失效，相较于普通期权限制更多，所以期权费会更便宜。因此，该选项错误。对于选项B，标准美式期权的期权费没有回望期权贵。因此，该选项错误。对于选项D，亚式期权的损益取决于期权有效期内标的资产的平均价格，相当于降低了期权价格的波动率，从而降低了期权的价值。所以亚式期权的期权费会比普通期权更加便宜。因此，该选项错误。

15. A 1-year American put option with an exercise price of \$40 will be worth \$16.00 at maturity with a probability of 0.25 and \$0.00 with a probability of 0.75. The current stock price is \$36. The continuous discount rate is 5%. The optimal strategy is to:

- A. Exercise the option because the option is in-the-money.
- B. Not exercise the option because the option is out-the money.
- C. Exercise the option now because the payoff from exercise exceeds the present value of the expected future payoff.
- D. No difference between exercise the option now or at the maturity, because the payoff from exercise is equal to the discounted present value of the future payoff.

参考答案: C

【莽学解析】

本题考查美式期权的提前行权问题。

如果立即行权，此美式看跌期权的损益为：

$$\text{Payoff} = 40 - 36 = 4$$

如果不提前行权，到期后的损益为：

$$\text{Payoff} = 16 \times 0.25 + 0 \times 0.75 = 4$$

将到期时的损益折现至期初，得到不提前行权时期权在期初的损益：

$$4 \times e^{-5\% \times 1} = 3.8$$

因为提前行权的损益大于不提前行权的损益，所以此美式看跌期权应该提前行权。因此正确选项为C。

对于选项A，判断是否提前行权，并不是却决于期权现在实值与否，而是比较提前行权和不提前行权的损小。因此，该选项错误。

对于选项B，判断是否提前行权，并不是却决于期权现在虚值与否，而是比较提前行权和不提前行权的损小。因此，该选项错误。

对于选项D，提前行权的损益大于不提前行权的损益，而不是等于。因此，该选项错误。

16. Which of the following is not an assumption of the Black-Scholes-Merton options pricing model?

- A. The underlying stock price follows lognormal distribution and the rate of return of the stock follows normal distribution.
- B. The interest rate changes randomly over time.
- C. The instantaneous variance of the return of the underlying is constant.
- D. Markets are perfect, i.e. short sales are allowed, there are no transaction costs or taxes, and markets operate continuously.

参考答案：B

【莽学解析】本题考查BSM模型的假设。BSM模型中假设无风险利率恒定且已知，并不会随着时间而改变。选项B描述错误，符合题意，为正确选项。对于选项A，BSM模型中假设资产的价格服从对数正态分布，而收益率服从正态分布。因此，该选项描述正确，不符合题意，为错误选项。对于选项C，BSM模型中假设资产收益率的波动率恒定且已知。因此，该选项描述正确，不符合题意，为错误选项。对于选项D，BSM模型中假设市场是完美的，即允许卖空，可进行连续交易，标的资产是可分割的，没有交易成本，没有税收，也没有监管约束，市场上没有套利机会。因此，该选项描述正确，不符合题意，为错误选项。

17. Derivatives are contracts whose values depend on the values of one or more financial variables, we use derivatives to hedge risk, to make some profit, which of the following is least correct considering the characteristic of derivatives?

- A. Forward is an over-the-counter contract which having many regulations, the risk of this derivative is less than that of futures in the case that the underlying asset, the maturity of time, and the other characteristics are the same.

- B. The advantage of OTC markets is that the contracts traded do not have to be the standard contracts defined by exchanges, and market participants can trade any contracts they like.
- C. A futures contract provides a similar payoff to a forward contract, but it trades on an exchange.
- D. Derivatives markets attract many kinds of traders, the leverage that speculators can obtain means that it is very easy for traders to take significant risks.

参考答案: A

【莽学解析】本题考查场内与场外市场的基本特征。远期合约在场外市场进行交易，受到的监管较少，信用风险比期货合约更大。期货合约在场内市场进行交易，受到的监管较多，没有信用风险。选项A描述错误，符合题意，为正确选项。对于选项B，场外市场交易的产品相较于场内市场交易的产品更具个性化，可以满足交易者特定的交易需求。因此，该选项描述正确，不符合题意，为错误选项。对于选项C，期货和远期合约的损益是非常接近的，主要的区别在于期货合约每天进行结算，而远期合约到期结算。因此，该选项描述正确，不符合题意，为错误选项。对于选项D，很多衍生品合约具有较高的杠杆，杠杆会放大收益和亏损，所以对于投机者而言，由于杠杆的存在会放大风险。因此，该选项描述正确，不符合题意，为错误选项。

18. Derivatives have become increasingly important in finance. They are used to transfer risks or the other purposes. which of the statement of derivatives are most correct?
- A. There are two types of option, A call option gives the holder the right to buy the underlying asset by a certain date for a certain price while the shorter of this option can reject the requirement to exercise of the holder.
- B. Traders use derivatives to hedge risk by constructing naked positions.
- C. Derivatives are very versatile instruments, they can be used for hedging, for speculation, and for arbitrage.
- D. A forward or futures contract involves an obligation to buy or sell an asset at a certain time in the future for a certain price, while option have the same function.

参考答案: C

【莽学解析】本题考查期权的基本特征。衍生品是一种应用广泛的金融产品，可用于对冲风险，投机和套利。因此正确选项为C。对于选项A，call option的买方有权在期权到期日以约定的价格买进标的资产，而卖方有义务在期权到期日以约定的价格卖出标的资产，卖方无法拒绝买方的行权要求。因此，该选项错误。对于选项B，在用衍生品做对冲时，构建的是covered positions，而不是naked positions。因此，该选项错误。对于选项D，远期和期货的买卖双方均有义务在合约到期时履行合约，而期权的买方只有权力没有义务，期权的卖方只有义务没有权力。所以期权和远期、期货是有区别的。因此，该选项错误。

19. In futures trading, clearinghouses play an important role. Which of the functions should the clearing houses fulfill in the settlement process of futures?
- A. In case of physical settlement, the clearinghouse guarantees that the longs will receive the specified merchandise.
- B. The clearinghouse receives delivery notices from the longs and assigns the notices to the shorts.
- C. Each day, members who have lost money pay their loss amount to the clearinghouse, while members who have gained will not receive their gain amount from the clearinghouse.
- D. The clearinghouse implements a procedure where short positions and long positions in a particular contract offset each other.

参考答案: D

【莽学解析】本题考查期货的交易机制。在期货的交易过程中，清算所会采用净额结算的方式，即在特定合约中，空头头寸和多头头寸相互抵消，最终支付净额的过程。因此正确选项为D。对于选项A，在实物交割的

过程中，卖方可以选择交割的资产类别和质量，因此清算所无法保证多头方一定能收到确定的标的资产。因此，该选项错误。对于选项B，清算所从卖方获取交割通知，然后传递给买方。因此，该选项错误。对于选项C，期货交易过程中每日结算，清算所会把亏损一方保证金账户中的资金划转给盈利一方的保证金账户中，盈利和亏损在当天均会结算。因此，该选项错误。

20. William Wang, FRM, entered into the long position of two wheat futures contracts matured on June. Each contract is 15,000 pounds of wheat. The current futures price is 150 cents per pound. The initial margin was about \$5,000 for each contract and the maintenance margin was \$3,500 for each contract. Based on the information above, what price changes will lead to the margin call and under what circumstances can \$2000 be withdrawn from the margin account by investors?

- A. When the futures price is below 140 cents/pound, investors will receive margin call; when the futures price rises to 156.67 cents/pound, investors can withdraw \$2000 margin.
- B. When the futures price is above 160 cents/pound, investors will receive margin call; when the futures price declines to 143.33 cents/pound, investors can withdraw \$2000 margin.
- C. When the futures price is below 130 cents/pound, investors will receive margin call; when the futures price rises to 163.33 cents/pound, investors can withdraw \$2000 margin.
- D. When the futures price is above 170 cents/pound, investors will receive margin call; when the futures price declines to 136.67 cents/pound, investors can withdraw \$2000 margin.

参考答案：A

#### 【考点解析】

本题考查期货保证金的计算。

期货合约的买方在期货价格下跌时亏损，在期货价格上涨时盈利。当保证金账户中的资金低于维持保证金水平时，会收到追加保证金的通知。假设期货价格为X时会收到追加保证金的通知，则有：

$$\frac{(150 - X)}{100} \times 15,000 \times 2 = (5,000 - 3,500) \times 2$$

解出X为140，即当期货价格低于140 cents/pound时会收到追加保证金的通知。

当期货合约产生盈利时可以将盈利取出，假设期货合约价格为Y时，期货合约的盈利达到2,000，则有：

$$\frac{(Y - 150)}{100} \times 15,000 \times 2 = 2,000$$

解出Y为156.67，即当期货价格为156.67 cents/pound时可以从保证金账户中取出\$2,000。因此，选项A正确。

21. A corn grower is concerned that the price he can get from the field in mid-October will be less than he has forecasted. To protect himself from price declines, the farmer has decided to hedge. The best available futures contract he can find is for August delivery. Which of the

following is the appropriate direction of his position and the source of basis risk that may impact the farmer?

- A. Short futures; Stack and roll
- B. Short futures; Cross hedging
- C. Long futures; Cross hedging
- D. Long futures; Stack and roll

参考答案: A

【莽学解析】本题考查对冲方向的判断和产生基差的原因。玉米种植者持有玉米，为现货的多头方，担心未来现货价格下跌，为了对冲价格下跌的风险需要进入期货合约的空头方。玉米种植者需要在10月中旬出售玉米，然而市场上合适的期货合约在8月份到期，这意味着在对冲时需要采用滚动对冲，期货到期时间与现货资产交易时间不一致会导致基差。因此正确选项为A。对于选项B，交叉对冲是指需要对冲的资产与期货合约的标的资产不一致。因此，该选项错误。对于选项C，玉米种植者持有玉米，为现货的多头方，需要进入期货合约的空头方对冲资产价格下跌的风险，而不是多头。期货到期时间与现货资产交易时间不一致需要采用滚动对冲而不是交叉对冲。因此，该选项错误。对于选项D，米种植者持有玉米，为现货的多头方，需要进入期货合约的空头方对冲资产价格下跌的风险，而不是多头。因此，该选项错误。

22. Stock A is expected to pay a \$1 dividend after 2 month and a \$2 dividend after 5 months. The stock price is now priced at \$30, the continuous compounded risk-free rate for all maturities is 8%. An investor has just entered into a short position in a 6-month forward contract of the stock. Based on the information above, what is the reasonable price of this stock forward contract?

- A. USD 28.19
- B. USD 29.34
- C. USD 29.98
- D. USD 30.41

参考答案: A

【莽学解析】

本题考查有股利情况下远期的定价。

首先计算当前时刻股票股息的现值:

$$PVD = 1 \times e^{-0.08 \times \frac{2}{12}} + 2 \times e^{-0.08 \times \frac{5}{12}} =$$

有股利情况下的远期价格公式:

$$F = (S - PVD) \times e^{rt}$$

将数据代入:

$$F = (30 - 2.92) \times e^{0.08 \times \frac{6}{12}} = 28.19$$

因此，选项 A 正确。

23. Suppose there are one-year exchange currency forward and futures contract with the same quoting price at 1.3000 GBPUSD. During the year, the futures price experiences a decrease to 1.2000 GBPUSD and then rises to 1.4000 GBPUSD at end of the year. The interest rate during the year is constant. Considering the mark-to-market effect of the futures contract, what is the favorable choice for a trader who wants to buy 1 million British pounds and eliminate the currency risk?

- A. Entering into the long position of the GBPUSD forward contract.
- B. Entering into the long position of the GBPUSD futures contract.
- C. Entering into the short position of the GBPUSD forward contract.
- D. Entering into the short position of the GBPUSD futures contract.

参考答案: A

【莽学解析】本题考查利用外汇远期对冲汇率风险。首先判断进入头寸的方向，GBPUSD报价形式是指一单位GBP价值多少单位USD，因此进入GBPUSD合约的多头，相当锁定购买GBP的成本（用USD购买），与题干描述的一年后希望以固定价格买入英镑一致，所以是long GBPUSD。其次判断选用forward还是futures。由于futures存在每日盯市制度，所以在题干描述的场景下，英镑汇率先降再升，这意味着GBPUSD futures多头方在期间有额外现金流支付，而forward没有这个困扰，即使最后时刻两种合约的期末价值相同，因此多头方在此场景下更愿意进入long forward。但如果场景变为先升后降，那么进入long futures会更好。因此正确选项为A。对于选项B，当英镑汇率先降再升时，forward合约更有吸引力，因此，该选项错误。对于选项C，一年后希望以固定价格买入英镑应该进入GBPUSD合约的多头，而不是空头。因此，该选项错误。对于选项D，一年后希望以固定价格买入英镑应该进入GBPUSD合约的多头，而不是空头。同时，当英镑汇率先降再升时，forward合约更有吸引力。因此，该选项错误。

24. A Canadian-based tire company will receive \$2,500,000 payment from its American-based distributor in two months. The Canadian firm hedges the exchange rate risk using a forward contract and the exchange rate of USDCAD is priced at 1.20. If the US dollar depreciates over the next two months and the expected future spot exchange rate of USDCAD would be 1.08, how much more or less will the Canadian-based tire firm receive in Canadian dollars by hedging, versus an unhedged position?

- A. 300,000 CAD more
- B. 300,000 CAD less
- C. 277,778 USD more
- D. 277,778 USD less

参考答案: A

【莽学解析】本题考查利用外汇远期对冲外汇风险。签订外汇远期时，2个月后以远期汇率USDCAD 1.2将2,500,000 USD转换成加元，此时可以获得的加元为： $2,500,000 \text{ USD} \times 1.2 = 3,000,000 \text{ CAD}$ 不签订外汇远期时，2个月后以即期利率USDCAD 1.08将2,500,000 USD转换成加元，此时可以获得的加元为： $2,500,000 \text{ USD} \times 1.08 = 2,700,000 \text{ CAD}$ 签订外汇远期对冲外汇风险比不签订外汇远期时可以多获得300,000 CAD。因此，选项A正确。

25. A currency trader notices that the 3-month future price is USD 0.7350. The trader gathered some further information as follow. Current spot USDCHF rate: 1.3680 (1USD = 1.3680CHF) 3-month USD interest rates: 1.05% 3-month Swiss interest rates: 0.35% Assume continuous compounding, what kind of actions should the trader take to capture an arbitrage opportunity:

- A. Borrow CHF, buy USD spot, long CHF futures

- B. Borrow CHF, sell CHF spot, short CHF futures
- C. Borrow USD, buy CHF spot, short CHF futures
- D. Borrow USD, sell USD spot, long CHF futures

参考答案: C

【莽学解析】

本题考查外汇远期的套利。

第一步: 基于现货美元和瑞士法郎的汇率, 计算理论上的远期汇率:

$$1.3680 \times e^{(0.35\%-1.05\%) \times 3/12} = 1.3656 \text{ CHF}$$

第二步: 调整题干中的3个月的市场远期汇率的报价:

$$\frac{1}{0.7350} = 1.3605 \text{ CHF}$$

第三步: 因为 $1.3605 < 1.3656$ , 市场的美元(瑞士法郎)远期汇率是相对低估(高估)的, 美元(瑞士法郎)即期汇率是相对高估(低估)的。

第四步: 套利策略为借入现货美元并通过即期汇率买入瑞郎, 同时做空远期瑞士法郎(做多远期美元)。因此选项为C。

对于选项A, 美元即期汇率是相对高估的, 瑞士法郎即期汇率是相对低估的, 所以应该借入现货美元并通过即期汇率买入瑞郎。美元远期汇率是相对低估的, 瑞士法郎远期汇率是相对高估的, 所以应该做空远期瑞士法郎(做多远期美元)。因此, 该选项错误。

对于选项B, 瑞士法郎即期汇率是相对低估的, 所以应该借入现货美元并通过即期汇率买入瑞郎。因此, 该选项错误。

对于选项D, 元远期汇率是相对低估的, 瑞士法郎远期汇率是相对高估的, 所以应该做空远期瑞士法郎。因此, 该选项错误。

26.

Which sequence of the commodities X, Y, and Z correctly identifies appropriate examples in terms of production, demand, and relative costs to other commodities?

Commodities X	Y	Z
Production Constant		Seasonal
Demand Relatively constant	Constant	Seasonal
Storage costs Relatively moderate	Moderate	Expensive

- A. Oil Corn Natural gas
- B. Natural gas Oil Corn
- C. Corn Natural gas Oil
- D. Natural gas Oil Corn

参考答案: A

【莽学解析】

本题考查大宗商品的特征。

谷物是具有季节性供给和稳定需求的一个大宗商品例子。天然气是具有稳定供给但是季节性需求的一个例子。天然气的存储是比较昂贵的，在美国冬季需求会达到顶峰。另外，由于向全球各地运输的成本差别很大，所以气价格也会有较大差异。

大宗商品	Oil	Corn	Natural Gas
供给	Constant	Seasonal	Constant
需求	Relatively constant	Constant	Seasonal
仓储成本	Relatively moderate	Moderate	Expensive

27. A large publicly held company refines crude oil into gasoline and sells gasoline wholesale with long-term contracts at fixed prices. The firm also owns the land, with full rights, from which it pumps crude oil. The firm financed the purchase of the land by issuing floating-rate bonds. This firm could reduce the volatility of its earnings by entering into an:

- I. interest-rate swap.
- II. oil commodity swap.

- A. I only.
- B. II only.
- C. Both I and II.
- D. Neither I nor II.

参考答案: A

【莽学解析】本题考查利用互换转变负债头寸。对于statement I，企业发行了浮动利率债券，所以企业对利率波动是敏感的。进入付固定收浮动的利率互换可以将浮动利率的负债转换为固定利率的负债，不受利率波动的影响。因此，需要进入利率互换。对于statement II，企业拥有自己的生产资源，然后用长期锁定的价格批发卖出，所以该企业是不面临商品价格风险的，原油商品互换将不会降低收益的波动性。因此，无需进入原油商品互换。所以只用进入利率互换，选项A正确。

28. Tom enterprise entered a swap with USD 5 million notional and received a floating rate based on 6-month Libor. It paid a fixed rate of 7% semiannually. The last cash flow of the swap exchanged 3 months ago. The swap has a remaining life of 15 months, with payment dates at 3, 9 and 15 months. Today, continuously compounded spot Libor rates for 3-month, 9-month, 15-month are 5.8%, 6.5% and 6.8% respectively. The Libor at last payment was 6.1%. The value of the swap to Tom is closest to:

- A. -\$13,024
- B. \$13,024
- C. -\$14,127
- D. \$14,127

参考答案: C

【莽学解析】

本题考查非结算时点利率互换的估值。

计算固定利率债券的价值：

$$PMT(\text{fixed}) = \frac{7\%}{2} \times 5,000,000 = \$175,000$$

$$\begin{aligned} PV_{\text{fixed}} &= 175,000e^{-5.8\% \times 0.25} + 175,000e^{-6.5\% \times 0.75} \\ &+ (175,000 + 5,000,000)e^{-6.8\% \times 1.25} \\ &= 172,481 + 166,673 + 4,753,301 = \$5,092,455 \end{aligned}$$

计算浮动利率债券的价值，在下一个结算日，浮动利率债券价值为：

$$\text{Value}(\text{floating}) = \text{Par} + \text{coupon} = 5,000,000 \times \left(1 + \frac{6.1\%}{2}\right) = \$5,152,500$$

当前时点浮动利率债券的价值为：

$$PV_{\text{floating}} = 5,152,500 \times e^{-5.8\% \times 0.25} = \$5,078,328$$

计算收浮动付固定头寸的互换价值：

$$\text{Value}(\text{swap}) = PV_{\text{floating}} - PV_{\text{fixed}} = 5,078,328 - 5,092,455 = -\$14,127$$

因此，选项 C 正确。

29.

A firm has entered into a 1-year fixed-for-fixed currency swap receiving USD and paying EUR semiannually. The USD leg has a notional USD 10,000,000 and an annual coupon of 1.5%. The EUR leg has a value of EUR 8,080,808 and an annual coupon of 0.5%. Given the discount and forward rates, what is the present value in USD of the swap on December 15, 2015?

Pay Date	USD/EUR Forward Rate	USD Discount Factor
June 15, 2016	1.240	0.9975
December 15, 2016	1.245	0.9950

A. -\$39,121

B. -\$10,893

C. \$10,893

D. \$39,121

参考答案：D

【莽学解析】

30. A financial institution has entered into a plain vanilla currency swap with one of its customers. The period left on the swap is two years with the institution paying 4.5% on USD120 million and receiving 2% on JPY3,500 million annually. The current exchange rate is 120

本题考查货币互换的估值。

一家金融机构进入收美元付欧元的货币互换，用债券法对互换进行估值，先计算美元端债券的价值：

$$\begin{aligned} PV_{USD} &= \left(10m \times \frac{1.5\%}{2}\right) \times 0.9975 + \left(10m \times \frac{1.5\%}{2} + 10m\right) \times 0.9950 \\ &= \$10,099,437.50 \end{aligned}$$

再计算欧元端债券的价值，并转换成美元计价：

$$\begin{aligned} PV_{EUR} &= \left(8,080,808 \times \frac{0.5\%}{2}\right) \times 1.240 \times 0.9975 + 8,080,808 \times \left(1 + \frac{0.5\%}{2}\right) \\ &\quad \times 1.245 \times 0.9950 = \$10,060,316.57 \end{aligned}$$

计算收美元付欧元头寸的互换价值：

$$Value(swap) = PV_{USD} - PV_{EUR} = 10,099,437.50 - 10,060,316.57 = \$39,121$$

因此，选项 D 正确。

JPY/USD, and the flat term structure in both countries generates a 3% rate in the United States and a 0.5% rate in Japan. The current value of this swap to the institution is closest to (continuously compounded) :

- A. \$93.04 million
- B. -\$93.04 million
- C. \$118.1 million
- D. -\$118.1 million

参考答案：B

【莽学解析】

31. Which option combination most closely simulates the economics of a short position in a futures contract? Suppose the options and futures contracts have the same underlying assets and options' strike price is equal to the futures price.

- A. Payoff of a long call plus a short put
- B. Profit of a long call plus a short put
- C. Payoff of a long put plus short call
- D. Profit of long put plus short call

参考答案：C

【莽学解析】

本题考查货币互换的估值。

这家金融机构支付美元，收入日元，其互换的价值为：

$$V_{\text{swap}} = PV_{\text{JPY}} - PV_{\text{USD}}$$

第一步：计算美元债的价值：

$$PV_{\text{USD}} = 120 \times 4.5\% \times e^{-0.03} + (120 \times 4.5\% + 120)e^{-0.03 \times 2} = \$12$$

第二步：计算日元债价值，并转换成以美元计价：

$$PV_{\text{JPY}} = (3500 \times 2\% \times e^{-0.005} + (3500 \times 2\% + 3500)e^{-0.005 \times 2}) \div$$
$$= \$30.30m$$

第三步：计算互换的价值：

$$\text{Value(swap)} = PV_{\text{JPY}} - PV_{\text{USD}} = -\$93.04 \text{ million}$$

因此，选项 B 正确。

32. There are important differences between options and forwards/futures, with forwards and futures, a trader is obligated to buy or sell the underlying asset at a certain price. In the U.S., tens of millions of options are traded daily on exchanges such as the CBOE, NASDAQ, the New York Stock Exchange, and the International Securities Exchange. What is the correct number of the following statement? I. A European call (or put) option gives the buyer the right to buy (or sell) an asset at a certain price at any time before and during the specified date. II. Options can be in the money, at the money, out of the money, this is referred to as their moneyness, a call option is out of the money when the asset price is greater than the strike price. III. Cash dividends usually don't affect the terms of a stock option while stock splits do lead to strike price adjustment. IV. Like the exchange-traded options market, the OTC options market is substantial, the main advantage of the OTC market is that financial institutions can tailor options to meet the specific needs of their clients.

- A. 1
- B. 2
- C. 3
- D. 4

参考答案：B

【莽学解析】本题考查期权的基本性质。对于Statement I，欧式期权只能在到期日行权，在到期日前的任何时间都不能行权，因此该陈述错误。对于Statement II，看涨期权的标的资产价格大于行权价格时，看涨期权盈利，为价内期权，而不是价外期权。因此该陈述错误。对于Statement III，股票期权的标的资产股票在分发股利时，一般不会影响股票期权，但如果是拆股的话，对应的股票期权的行权价要经过适当的调整。因此该陈述正确。对于Statement IV，期权可以再场内和场外交易，场外交易的期权灵活度更高，可以满足客户的个人需求。因此该陈述正确。因此有2个陈述正确，选项B正确。

该题主要考点为期权的损益和利润。

买入一份 put option 的损益为：

$$\text{Max}(0, X - S_t)$$

卖出一份 call option 的损益为：

$$-\text{Max}(0, S_t - X) = \min(0, X - S_t)$$

上述两个头寸组合的损益为：

$$X - S_t$$

与 short futures 的损益相同。因此正确选项为 C。

对于选项 A，买入一份 call option 和卖出一份 put option 的组合损益与 long futures 的损益相同。因此，该选项错误。

对于选项 B，计算期权利润时需要考了期权的期权费，call option 和 put option 的期权费不一定相等，所以买入一份 call option 和卖出一份 put option 的组合利润为：

$$S_t - X + p - c$$

因此，该选项错误。

对于选项 D，买入一份 put option 和卖出一份 call option 的组合利润为：

$$X - S_t + c - p$$

因此，该选项错误。

33. There are three statements about the upper/lower bounds of the options on a non-dividends stock as below: I. Call option has the same upper and lower bounds between American and European styles. But put option in American style has higher level at upper and lower bounds than the one in European style. II. The lower bound for an American put option is  $\max\{K-S, 0\}$ , because an American put can be exercised at any time, so the promised cash flow receiving should not be discounted. III. The upper bound of a American call option is the strike price, while the one of a American put option is underlying stock price. How many statements above is accurate?

- A. one
- B. two
- C. three
- D. none

参考答案：B

【莽学解析】本题考查无股利情况下的期权价值上下界。对于Statement I，欧式和美式call option的上下界保持一致，因为不含持有期收益的call option不会提前行权，美式和欧式没有差异。但卖权有可能提前行权，所以美式卖权的上下界要比欧式的大一些。因此该陈述正确。对于Statement II，美式put option的下界是直接用执行价格减去标的价格，不需要折现，因为期权存续期内任意时刻，只要美式卖权所有者发起行权，他就会立刻收到金额为X的现金流，而不需要等到期权到期。因此该陈述正确。对于Statement III，美

式call option的上界是标的资产价格，美式put option的上界是执行价格，表述说反了。因此该陈述错误。因此有2个陈述正确，选项B正确。

34. According to an in-house research report, it is expected that USDJPY will trade near 97 at the end of March. Frankie Shiller, the investment director of a house fund, decides to use an option strategy to capture this opportunity. The current level of the USDJPY exchange rate is 97 on February 28. Accordingly, which of the following strategies would be the most appropriate for the largest profit while the potential loss is limited?

- A. Long a call option on USDJPY and long a put option on USDJPY with the same strike price of USDJPY 97 and expiration date.
- B. Long a call option on USDJPY with strike price of USDJPY 97 and short a call option on USDJPY with strike price of USDJPY 99 and the same expiration date.
- C. Short a call option on USDJPY and long a put option on USDJPY with the same strike price of USDJPY 97 and expiration date.
- D. Long a call option with strike price of USDJPY 96, long a call option with strike price of USDJPY 98, and sell two call options with strike price of USDJPY 97, all of them with the same expiration date.

参考答案: D

【莽学解析】本题考查期权交易策略的构建和应用。当前美元和日元的汇率水平为97，投资者认为3月底美元和日元的汇率仍为97，即认为市场汇率平稳。构建交易策略需要在市场平稳的情况下获利，并保证潜在损失有限，可以采用蝶式价差策略。买一份执行价为96的call option，买一份执行价为98的call option，卖出两份执行价为97的call option，相当于构建了蝶式价差策略，当汇率稳定在97附近时可以盈利，并且潜在的亏损是有限的。因此正确选项为D。对于选项A，买入一份call option和put option，相当于构建了跨式策略，在现货价格保持平稳的情况下将会产生损失。因此，该选项错误。对于选项B，买入一份行权价低的call option，卖出一份行权价高的call option，相当于构建了牛市价差策略，当现货价格上涨时会产生盈利。因此，该选项错误。对于选项C，卖出一份call option，买入一份put option，相当于做空现货头寸，当现货价格下跌时会产生盈利。因此，该选项错误。

35. A stock is currently trading at USD 45, and its annual price volatility is 30%. The risk-free rate is 1.5% per year. A risk manager is developing a 1-step binomial tree for a 2-year horizon. What is the risk-neutral probability that the stock will move down?

- A. 30%
- B. 43%
- C. 57%
- D. 70%

参考答案: C

【莽学解析】

36. An analyst is pricing a 2-year European put option on a non-dividend-paying stock using a binomial tree with two steps of one year each. The stock price is currently USD 38, and the strike price of the put is USD 40. What is the value of the put closest to, assuming that the annual risk-free rate will remain constant at 2% over the next two years and the annual stock volatility is 15%?

- A. 3.04 USD
- B. 3.48 USD

本题考查风险中性下的上涨和下跌概率。

先计算上涨和下跌因子：

$$u = e^{\sigma\sqrt{t}} = e^{30\% \times \sqrt{2}} = 1.5285$$

$$d = 1/u = 0.6543$$

再计算风险中性下上涨和下跌概率：

$$\pi_u = \frac{e^{rt} - d}{u - d} = \frac{e^{1.5\% \times 2} - 0.6543}{1.5285 - 0.6543} = 43\%$$

$$\pi_d = 1 - \pi_u = 57\%$$

因此，选项 C 正确。

C. 3.62 USD

D. 3.81 USD

参考答案：B

【莽学解析】

37. What is the price of a three month European put option on a non-dividend-paying stock with a strike price of \$50 when the current stock price is \$50, the risk-free interest rate is 10% per annum, and the volatility is 30% per annum? The table for  $N(x)$  is shown below:

x	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	
	0.00	0.50000	0.50400	0.50800	0.51200	0.51600	0.51990	0.52390	0.52790	0.53190	0.5359
	0.10	0.53980	0.54380	0.54780	0.55170	0.55570	0.55960	0.56360	0.56750	0.57140	0.5753
	0.20	0.57930	0.58320	0.58710	0.59100	0.59480	0.59870	0.60260	0.60640	0.61030	0.6141
	0.30	0.61790	0.62170	0.62550	0.62930	0.63310	0.63680	0.64040	0.64430	0.64800	0.6517
	0.40	0.65540	0.65910	0.66280	0.66640	0.67000	0.67360	0.67720	0.68080	0.68440	0.6879
	0.50	0.69150	0.69500	0.69850	0.70190	0.70540	0.70880	0.71230	0.71570	0.71900	0.7224
	0.60	0.72570	0.72910	0.73240	0.73570	0.73890	0.74220	0.74540	0.74860	0.75170	0.7549
	0.70	0.75800	0.76110	0.76420	0.76730	0.77030	0.77340	0.77640	0.77940	0.78230	0.7852
	0.80	0.78810	0.79100	0.79390	0.79670	0.79950	0.80230	0.80510	0.80780	0.81060	0.8133
	0.90	0.81590	0.81860	0.82120	0.82380	0.82640	0.82890	0.83550	0.83400	0.83650	0.8389

本题考查欧式期权两步二叉树的计算。

由题中信息已知：

$$S = 38, T = 2, t = 1, X = 40, r = 2\%, \sigma = 15\%$$

计算上涨和下跌因子：

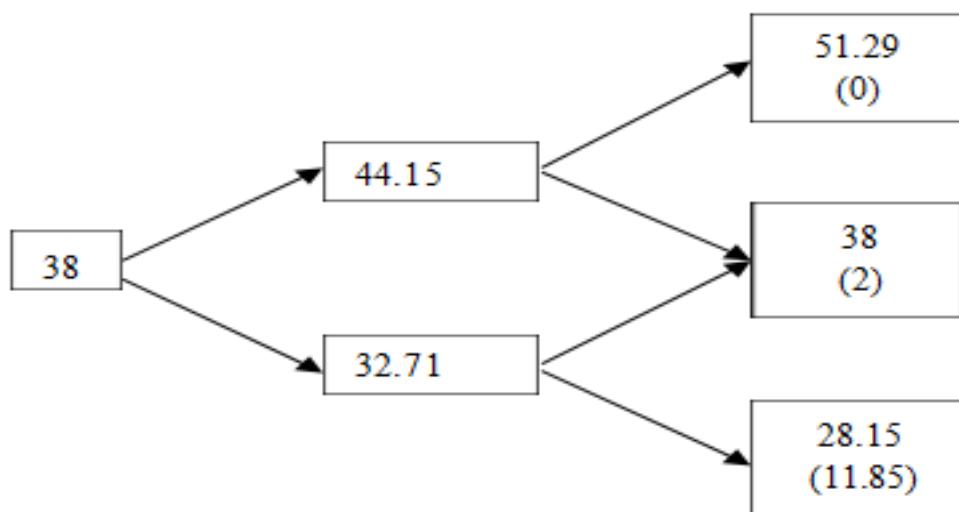
$$u = e^{\sigma\sqrt{t}} = e^{15\% \times \sqrt{1}} = 1.1618$$

$$d = 1/u = 0.8607$$

计算风险中性下的上涨和下跌概率：

$$\pi_u = \frac{e^{rt} - d}{u - d} = \frac{e^{2\% \times 1} - 0.8607}{1.1618 - 0.8607} = 0.5297$$
$$\pi_d = 1 - \pi_u = 0.4703$$

画出对应的二叉树：



将到期时期权的损益一步一步往前折现，第一步上涨节点对应的期权价值为：

$$P_u = (0 \times 0.5297 + 2 \times 0.4703) \times e^{-2\% \times 1} = \$0.9220$$

第一步下跌节点对应的期权价值为：

$$P_d = (2 \times 0.5297 + 11.85 \times 0.4703) \times e^{-2\% \times 1} = \$6.5011$$

期初期权的价值为：

$$P_0 = (0.9220 \times 0.5297 + 6.5011 \times 0.4703) \times e^{-2\% \times 1} = \$3.48$$

因此，选项 B 正确。

- A. \$2.37
- B. \$2.48
- C. \$2.25
- D. \$2.63

参考答案: A

【莽学解析】

本题考查 BSM 模型的计算。

已知  $S_0 = 50, K = 50, r = 0.1, \sigma = 0.3, T = 0.25$

计算  $d_1$  和  $d_2$ :

$$d_1 = \frac{\ln\left(\frac{50}{50}\right) + \left(0.1 + \frac{0.3^2}{2}\right) \times 0.25}{0.3 \times \sqrt{0.25}} = 0.24$$

$$d_2 = d_1 - 0.3 \times \sqrt{0.25} = 0.09$$

根据 BSM 模型，看跌期权价值为:

$$\text{Put} = Xe^{-rT}N(-d_2) - S_0N(-d_1)$$

查表可得:

$$N(-d_1) = 1 - N(d_1) = 1 - 0.5948 = 0.4052$$

$$N(-d_2) = 1 - N(d_2) = 1 - 0.5359 = 0.4641$$

代入公式可得:

$$\text{put} = 50 \times 0.4641 \times e^{-0.1 \times 0.25} - 50 \times 0.4052 = \$2.37$$

因此，选项 A 正确。

38. In order to test the students' understanding of the option Greeks other than delta and gamma, the professor added the following True or False questions in the quiz: I. The rho of a call option changes with the passage of time and tends to approach zero as expiration approaches, but this is not true for the rho of put options. II. Theta is always negative for long calls and long puts and positive for short calls and short puts. III. Vega of a call and a put is different in sign. Which of the above is(are) correct?

- A. I only.
- B. II and III
- C. I and II

D. None

参考答案: D

**【莽学解析】**本题考查希腊字母的定义和性质。对于Statement I, call option和put option的rho都会随着时间接近到期日而趋近于0, 因此该陈述错误。对于Statement II, Theta一般而言是负的, 即随着流逝时间的增加(剩余时间减少), 期权的价值会减小, 但对于深度价内的欧式期权而言, 流逝时间的增加(剩余时间减少)可能会导致期权价值的增加, 因为持有者更希望期权马上到期而获得盈利, 剩余时间反而是一种“累赘”。因此该陈述错误。对于Statement III, long call option和long put option的Vega均为正, 负号相同。因此该陈述错误。因此所有陈述均错误, 选项D正确。

39. An investor is looking to create an options portfolio on XYZ stock that will have virtually zero Vega exposure while maximizing the ability to profit from the increase in interest rates. If the current price of XYZ is \$50, which of the following would accomplish his goals?

- A. Sell a call with a strike price of \$50.
- B. Buy a call with a strike price of \$25.
- C. Sell a put with a strike price of \$50.
- D. Buy a put with a strike price of \$25.

参考答案: B

**【莽学解析】**本题考查希腊字母的性质。深度实值和虚值的call和put option的Vega趋近于0, 当前现货价格为50, 期权的行权价应当距离50较远才能保证组合的Vega趋于0。当利率上涨时组合价值增加, 意味着组合的Rho大于0, 而long call和short put的Rho大于0, short call和long put的Rho小于0。综合来看, 应该买入深度实值或者虚值的call option, 卖出深度实值或者虚值的put option。因此正确选项为B。对于选项A, short call option的Rho小于0, 平值期权的Vega不为0。因此, 该选项错误。对于选项C, 平值期权的Vega不为0。因此, 该选项错误。对于选项D, long put option的Rho小于0。因此, 该选项错误。

40. A trader, Jim, constructed a portfolio of stock A and option X on stock A, this portfolio's delta is now 56 and gamma is 230. The option Y has a gamma 13 and delta 0.3. What should Jim do to make the portfolio both delta and gamma neutral?

- A. long 17.69 option Y, long 50.69 stock A.
- B. short 17.69 option Y, short 50.69 stock A.
- C. long 16.45 option Y, short 10.18 stock A.
- D. short 16.45 option Y, long 10.18 stock A.

参考答案: B

**【莽学解析】**

41. The major activity of an investment bank is raising capital for companies in the form of debt, equity or more complicated securities. How many statements of financing arrangement is (are) correct?I. The bank buys the securities at the agreed upon price and then attempts to sell them for a lower price in a firm commitment arrangement. II. In the case of a public offering, the agreement can be on a best efforts or a firm commitment basis. III. A firm commitment arrangement is riskier for an investment bank than a best efforts arrangement.

- A. one
- B. two
- C. three
- D. none

参考答案: B

本题考查 delta 和 gamma 的对冲。

先利用 option Y 让组合达到 gamma neutral:

$$13 \times N_{\text{option}} + 230 = 0$$

解出：

$$N_{\text{option}} = -17.69$$

然后再利用 stock A 让组合达到 delta neutral，其中原组合的 delta 值已经变：

$$56 - 17.69 \times 0.3 + 1 \times N_{\text{stock}} = 0$$

解出：

$$N_{\text{stock}} = -50.69$$

因此，选项 B 正确。

【莽学解析】本题考查投资银行证券发行的方式。对于 statement I，包销协议下，投行以低价收购证券，以更高价发行，从而获得价差收入。因此该陈述错误。对于 statement II，公开发行模式下，可分为包销和代销两种形式。私募发行模式下，投行接受协定的佣金收入。因此该陈述正确。对于 statement III，包销形式比代销形式对于投行而言经营风险更大，因为有无法足额发行的潜在风险。因此该陈述正确。因此有2个陈述正确，选项B正确。

42. For insurance company, the regulatory framework known as Solvency II was implemented in 2016 and applies to all insurance companies. According to the Solvency II and the situation of insurance regulation in the United States, which of the following statements is most likely correct?

- A. An insurance company is required to formulate a plan to bring its capital back when its capital falls below the minimum capital requirement (MCR).
- B. An insurance company should transfer its existing policies to another insurance company when its capital falls below the solvency capital requirement (SCR).
- C. In the USA, insurance is regulated at the state level rather than at the federal level.
- D. Capital requirements for P&C insurance company tends to be lower than those for Life Insurance Company, because the longevity and mortality risks is more significant.

参考答案：C

【莽学解析】本题考查保险公司的监管和资本金要求。美国的保险业监管是州一级管理的，所以一些大型的保险公司最多可能会同时面临50多种不同的监管框架，这也是美国保险业的重要风险之一。因此正确选项为C。对于选项A，MCR是保险公司的最低资本金要求红线，一旦资本金跌破红线，就会面临破产清算，现有业务有被全部接管的风险。因此，该选项错误。对于选项B，SCR是对保险公司持续经营的资本金要求，短期内如果触及，会被勒令快速补足资本金，并且停业整顿。因此，该选项错误。对于选项D，般而言财险公司的资本金监管要求会比寿险公司要高，因为监管认为短期集中爆发财产人员损伤的情况会比寿险公司经营的长寿/早夭风险要更严峻，所以财险公司需要准备更多的资本金。因此，该选项错误。

43. Tom is the manager of the derivatives department of GS investment company. He is holding an

interview and needs the interviewer to describe some characteristics of derivatives. Jerry and Mike make the following descriptions as candidates. Jerry states that derivatives are only used by companies to manage risks from the unexpected changes of interest rate, foreign exchange, and commodity price, etc. Mike holds that derivatives are sometimes added to corporate bond issuances. Which of the statement ( ) above is/are most likely correct?

- A. Only Jerry
- B. Only Mike
- C. Both Jerry and Mike
- D. Neither of them

参考答案: B

【莽学解析】本题考查衍生品的基础概念。对于Jerry的描述，公司不仅可以利用衍生品去管理利率、外汇和商品价格等意外变化带来的风险，还可用衍生品来进行投机和套利。因此该描述错误。对于Mike的描述，衍生品有时会被添加到公司债券中，作为内嵌期权伴随债券一起发行。因此该描述正确。因此只有Mike的陈述正确，选项B正确。

44. Tom is currently in a long position in a futures contract. The current futures contract price is \$35. He expects asset prices to rise rapidly in the future and reach the resistance level of \$45 and then may fall. Which order could automatically help Tom get the most profit?
- A. Sell market order
  - B. Sell market-if-touched order at \$45
  - C. Stop-loss sell order at \$35
  - D. Stop-and-limit sell order which stop price is \$35 and limit price is \$30

参考答案: B

【莽学解析】本题考查期货的报价指令。触价指令指资产达到规定价格或更有利的价格即成为市价订单，用于限制盈利。当股价触及45美元时候生效成为市价指令，开始执行卖出指令，从而在预期下获得最大收益。因此正确选项为B。对于选项A，市场指令是指要求以最优的市场价格尽快买入或卖出，当设置卖出市价指令时，会以市价价格快速卖出，无法获取预期的收益。因此，该选项错误。对于选项C，止损指令指资产达到规定价格或更不利的价格即成为市价订单，用于限制亏损。当前股价为35美元，卖出止损订单价格设置在35美元时，一旦股价上涨超过35美元该订单将无法执行卖出指令，因此，该选项错误。对于选项D，止损限价指令指资产达到规定价格或更不利的价格即成为限价订单，用于锁定交易价格区间。当止损价设置为35美元，限价设置为30美元，意味着当市场价格低于35美元时开始卖出，但卖出价需要高于30美元。

45. Jack, as the derivatives investment manager of GS investment company, is introducing the relevant characteristics of futures contracts to customers. Statement 1: When one member is taking a new longposition and another member becomes a short position in the contract, the open interest increases by two. Statement 2: As the delivery period approaches, the futures price converges to the spot price, and the market in which the futures price increases as the time to maturity increases is called the inverted market. Which of the statement ( ) above is/are most likely correct?
- A. Only statement 1
  - B. Only statement 2
  - C. Both statements 1 and 2
  - D. Neither of them

参考答案: D

【莽学解析】本题考查期货合约的特征。对于Statement1，多空双方共同新签一份期货合约时，未平仓量仅增加一份。因此该称述错误。对于Statement2，随着交割期的临近，期货价格收敛于现货价格，期货价格随

着到期时间的增加而增加的市场称为正向市场 (normal market)。因此该陈述错误。因此Statement 1和Statement 2均陈述错误，选项D正确。

46. Suppose that a hedger plans to sell 100,000 bushels of corn in June and uses the July futures contract for hedging. Each contract is on 5,000 bushels of corn and therefore a total of twenty contracts are shorted. Suppose that the futures price at the time the hedge is initiated is 200 cents per bushel and that the futures price is 220 cents per bushel when the hedge is closed out in June. The spot price for the corn being sold in June is 225 cents per bushel. What is the USD price received for the corn when the loss from hedging is considered?

A. 225,000 USD

B. 245,000 USD

C. 200,000 USD

D. 205,000 USD

参考答案: D

【莽学解析】

本题考查空头对冲者净收益的计算。

公司在现货市场上出售玉米的收益为：

$$225 \div 100 \times 100,000 = 225,000 \text{ USD}$$

公司进入期货合约的空头，到期时期货合约的价格上涨，在期货市场的亏

$$(220 - 200) \div 100 \times 20 \times 5,000 = 20,000 \text{ USD}$$

将现货市场和期货市场结合在一起后，出售玉米的最终收益为：

$$225,000 - 20,000 = 205,000 \text{ USD}$$

因此正确选项为 D。

47. A portfolio is worth USD 200 million that has a beta relative to the S&P 500 index of 0.75. The S&P 500 index is currently trading at 5,000. The 3-month S&P 500 futures with a contract size of 250USD × futures price is trading at 4,500. Using the 3-month S&P 500 futures contract, which of the following transactions would increase the portfolio's beta to 0.9?

A. Long 27 futures contracts.

B. Short 27 futures contracts.

C. Long 24 futures contracts.

D. Short 24 futures contracts.

参考答案: A

【莽学解析】

48.

本题考查利用期货合约调整组合贝塔值。

依据题意，将组合的贝塔值由 0.75 增加至 0.9，需要买入期货合约，买入数

$$N^* = (\beta^* - \beta) \frac{V_A}{V_F}$$

代入数值可得：

$$(0.9 - 0.75) \times \frac{200,000,000}{250 \times 4,500} \approx 27$$

因此正确选项为 A。

On January 10, a company decides to hedge the purchase of 15,000 bushels of corn on October 10. The following table gives futures (cents per bushel) of three selected contracts on four different dates. Each corn contract is on 5,000 bushels. What is the net (after hedge) paid for the corn as a function of the spot price on October 10?

	January 10	April 10	July 10	October 10
May 20, Futures Price	300	320		
August 20, Futures Price		330	320	
November 20, Futures Price			325	300
Spot Price	305	310	315	320

A. 45,750 USD

B. 48,000 USD

C. 2,250 USD

D. 50,250 USD

参考答案：D

【考点解析】

本题考查滚动对冲的盈亏计算。

公司未来在现货市场上买入玉米，为了对冲玉米价格上涨的风险，需要进入期货合约的多头方。首先，在 5 月 20 日进入 5 月 20 日到期的玉米期货合约的多头，并在 4 月 10 日进行平仓。然后，在 8 月 20 日进入 8 月 20 日到期的玉米期货合约的多头，并在 7 月 10 日进行平仓。最后，在 11 月 20 日进入 11 月 20 日到期的玉米期货合约的多头，并在 10 月 10 日进行平仓。滚动对冲的净利润为：

$$[(320 - 300) + (320 - 330) + (300 - 325)] \div 100 \times 5,000 \times 3 = -2,250$$

在现货市场上买入玉米的成本为：

$$320 \div 100 \times 15,000 = 48,000 \text{ USD}$$

买入玉米的总成本为：

$$48,000 + 2,250 = 50,250 \text{ USD}$$

因此正确选项为 D。

49. Six months ago a company entered in a one-year forward contract to buy the stock. At the time, the one-year forward price was USD 88. The stock price is now USD 95 and the stock will pay a dividend of USD 3 at the end of forward contract. The continuously compounded risk free rate is 4% per year for all maturities, and there are no storage costs. Which of the following is closest to the value of the forward contract?

- A. -\$5.80
- B. \$5.80
- C. -\$8.74
- D. \$8.74

参考答案: B

【蒙学解析】

本题考查标的资产期间有收益的远期合约估值。

6个月前签订了期限为1年的远期合约，剩余期限为6个月，签订时远期价格 $F_0(T) = 88$ ，当前市场上的现货价格为95，标的资产在远期合约到期时付股利3 USD。远期合约的估值公式为：

$$V_{\text{Forward}} = S_t - PVD_t - F_0(T) \cdot e^{-r(T-t)}$$

股利的现值为：

$$PVD_t = 3 \times e^{-4\% \times 0.5} = 2.94$$

已知的条件为：

$$S_t = 95, F_0(T) = 88, T = \frac{6}{12} = 0.5, PVD_t = 2.94, r = 4\%$$

将数据代入可得：

$$V_t = 95 - 2.94 - 88e^{-4\% \times 0.5} = \$5.80$$

因此，选项B正确。

50. Jack and Rose are traders in the derivatives Department of GS investment company. They are discussing the difference between forward and futures. Which of the following statements is least likely correct?

- A. As the forward contract is an OTC derivative, the trading process is more flexible, so there are a series of delivery dates.
- B. The short position of futures contracts has the right to choose the delivery time.
- C. If the income yield is greater than the interest rate, the short position of futures contracts will deliver later.
- D. If the futures price is positively correlated with the interest rate, the futures price is larger than the forward price.

参考答案: A

**【莽学解析】**本题考查远期合约与期货合约的异同。由于远期合约是场外衍生品，所签订的合约往往是定制化的，合约存续期间很难转卖或提前结束，所以一般都是到期末进行交割的，不存在一系列的交割日。因此A选项描述错误，符合题意，为正确选项。对于B选项，期货合约的空头方有权选择期货的交割时间。因此，该选项描述正确，不符合题意，为错误选项。对于C选项，如果现货收益率大于无风险利率，期货合约的空头方会更晚选择交割，多持有现货一段时间。因此，该选项描述正确，不符合题意，为错误选项。对于D选项，如果期货价格与利率正相关，期货价格上涨时，利率也上涨，期货合约的多头方可以将获取的收益用于投资从而赚取投资收益，而远期合约的多头方无法获取期间盈利的投资收益，则期货价格大于远期价格。因此，该选项描述正确，不符合题意，为错误选项。

51. Based on the covered interest rate parity, if the risk-free rate for currency XXX is higher than that for currency YYY, XXX is weaker in the forward market than in the spot market. A currency trader notices that the interest rates in currencies USD and EUR are 3% and 5% per annum (respectively) and the spot exchange rate is EURUSD 1.2500. Based on the covered interest rate parity, how many percent will the euro appreciate or depreciate in one year?

- A. appreciate 2%
- B. appreciate 5%
- C. depreciate 5%
- D. depreciate 2%

参考答案：D

**【莽学解析】**

本题考查基于抛补利率平价理论计算货币的升贬值幅度。

基于抛补利率平价理论，高利率货币远期将贬值，低利率货币远期将升值。贬值幅度近似等于两种货币的利率之差，所以欧元未来将贬值 2%。也可计算远期汇率进而得到升贬值幅度。一年期 EURUSD 外汇远期合约的理

$$F = S \times \frac{(1 + R_{USD})^1}{(1 + R_{EUR})^1} = 1.2500 \times \frac{(1 + 3\%)^1}{(1 + 5\%)^1} = 1.2262$$

一年后欧元的贬值比例为：

$$\frac{1.2262 - 1.2500}{1.2500} = -1.9\%$$

与两个货币的利差 2% 接近，因此正确选项为 D。

52.

- A. Only Jerry
- B. Only Tom
- C. Both Jerry and Tom
- D. Neither of them

参考答案：D

Tom and Jerry are discussing the relationship between expected future spot price of an asset at time T $\{E(S_T)\}$  and futures price $\{F(T)\}$ . Tom holds that if the systematic risk of the underlying asset is positive, the expected future spot price of the asset will be less than futures price. Jerry adds that if hedgers tend to hold short positions, the expected future spot price of the asset will be less than futures price. Which statement(s) above is/are most likely correct?

【莽学解析】

本题考查预期现货价格和期货价格的关系。

对于 Tom 的陈述,当资产的 $\beta$ 大于 0 时,根据 CAPM 模型, $E(R_i) = r_f + \beta_i[E(S_T) - r_f]$ , 组合的预期回报率 ( $E(R_i)$ ) 高于无风险利率 ( $r_f$ ), 根据 $\frac{E(S_T)}{[1+E(R_i)]^T} = \frac{E(S_T)}{[1+r_f(1+\beta_i)(T-1)]^T} > 1$  则有 $E(S_T) > F(T)$ 。因此 Tom 的陈述错误。

对于 Jerry 的陈述,市场上对冲者较多,投机者较少,对冲者为了尽快达成交易会在价格上做出一定的让步,因此对冲者作为期货的卖方会以更低的价格卖出期货,导致期货价格会低于预期未来现货价格。因此 Jerry 的陈述错误。因此 Tom 和 Jerry 的陈述均错误,选项 D 正确。

53.

Considering a 2-year interest swap between Apple and Citigroup. Apple agrees to pay Citigroup an interest rate of 3% per annum on a notional principal of \$200 million, and in return, Citigroup agrees to pay Apple the six-month LIBOR rate on the same notional principal. The loan rates for Apple and Citigroup in fixed markets and floating markets are as follows. Which of the following statements regarding comparative advantage between Apple and Citigroup is most correct?

	Fixed markets	Floating markets
Apple	3%	LIBOR+0.1%
Citigroup	3.1%	LIBOR+0.4%

- A. Citigroup corporation has a comparative advantage in floating rate markets.
- B. Apple has the absolute advantage in both fixed and floating rate markets.
- C. Citigroup could transform its floating liability to fixed liability through the above swap contract.
- D. There is no benefit between Apple and Citigroup in this swap.

参考答案: B

【莽学解析】

本题考查利率互换中的比较优势与绝对优势。

从苹果公司和花旗银行分别在固定和浮动利率市场的贷款利率可以得到，公司在浮动利率和固定利率市场上的贷款利率均低于花旗银行，所以苹果公司在浮动利率和固定利率市场上均具有绝对优势。因此正确选项为 B。

对于 A 选项，在固定利率市场上，苹果公司的贷款成本比花旗银行便宜  $3.0\% - 0.1\% = 0.1\%$ ，在浮动利率市场：苹果公司的贷款成本比花旗银行便宜  $LIBOR + 0.4\% - (LIBOR + 0.1\%) = 0.3\%$ 。所以在浮动利率市场上苹果公司具有绝对优势，在固定利率市场上花旗银行具有比较优势。因此，该选项错误。

对于 C 选项，两家公司在按照各自具有比较优势的市场上借款后，参与互换，苹果公司收到浮动利率，支出固定利率，可以将浮动利率负债转换成固定利率负债。花旗银行收到固定利率，支出浮动利率，可以将固定利率负债转换成浮动利率负债。因此，该选项错误。

对于 D 选项，在互换中，双方节省的总融资成本为  $(IBOR + 0.4\% + 3.1\%) - (LIBOR + 0.1\% + 3.1\%) = 0.2\%$ ，对于双方而言均会降低融资成本。因此，该选项错误。

54. Jack is the major shareholder of XYZ company, but he expects that the company's shares will fall in the future. On the premise of not selling shares, what strategy should he synthesize to avoid risks?

- A. Buyputoptions; Protective put strategy
- B. Sellcalloptions; Covered call strategy
- C. Buy risk free bonds; Principal protected notes
- D. Buy call options; Fiduciary call strategy

参考答案: A

【莽学解析】本题考查单一期权策略。股票的多头头寸结合看跌期权的多头头寸可构成Protective put strategy，使得股票持有者在不卖出股票的情况下，保护其在股价下跌时不遭受损失。因此正确选项为A。对于选项B，股票的多头头寸结合看涨期权的空头头寸可构成Covered call strategy，当股价下跌时投资者会遭受损失。因此，该选项错误。对于选项C，股票的多头头寸结合无风险债券的多头头寸构成的组合，当股价下跌时投资者会遭受损失。Principal protected notes是指单一期权的头寸和无风险债券的多头头寸构成的组合，可以提供本金保护。因此，该选项错误。对于选项D，股票的多头头寸结合看涨期权的多头头寸构成的组合，当股价下跌时投资者会遭受损失。Fiduciary call strategy是指看涨期权的多头头寸和无风险债券的多头头寸构成的组合。因此，该选项错误。

55. Jack is a junior analyst in GS Investment Fund. His team is discussing the six factors that affect the price of options. Jack states that the value of call option rises, when the underlying asset price increases. Rose states that the value of put option decreases, when the present value of the dividend of the underlying stock increases. Which of the statement ( ) above is/are most likely correct?

- A. Only Jack

- B. Only Rose
- C. Both Jack and Rose
- D. Neither of them

参考答案: A

【莽学解析】

本题考查影响期权价格变动的六要素。

对于 Jack 的描述, 当股票价格上升时, 根据看涨期权的损益公式:  $\max(S - X, 0)$ , 对应的看涨期权的内在价值随之上升, 因此该描述正确。

对于 Rose 的描述, 当股票的股息现值上升时, 根据看跌期权的损益公式:  $\max\{X - (S - PVD), 0\}$ , 对应的看跌期权的内在价值随之上升, 因此该描述正确。因此只有 Jack 的陈述正确, 选项 A 正确。

56. Suppose the current stock price is USD 18. The price of a European call option with strike price USD 20 that will mature in three months is USD 3. The price of a European put with the same strike price and time to maturity is USD 4, while the three-month risk free rate is 2% per year (annually compounded). Assume the stock on which the options are written provides no dividends. What kind of actions should an arbitrageur take to capture an arbitrage opportunity?

- A. Long the call, short the risk-free bond, long the put, and short the stock.
- B. Short the call, long the risk-free bond, short the put, and long the stock.
- C. Short the call, short the risk-free bond, long the put, and long the stock.
- D. Long the call, long the risk-free bond, short the put, and short the stock.

参考答案: C

【莽学解析】

57. Jack bought a call option expiring on December 2021 on XYZ stock with an exercise price of \$10 for a \$2 premium, and the other is a put option on December 2021 on XYZ stock with an exercise price of \$8 and for a \$1 premium. Please identify this option strategy and calculate breakeven point ( ).

- A. Long strangle, breakeven points are \$13 and \$5
- B. Short calendar spread, breakeven points is \$13
- C. Short straddle, breakeven points are \$13 and \$5
- D. Long bull spread, breakeven points is \$13

参考答案: A

【莽学解析】

本题考查期权买卖权平价关系。

无股利情况下的期权买卖权平价公式为：

$$c + \frac{X}{(1 + r_f)^T} = p + s$$

看涨期权的价格为 3 USD，看跌期权的价格为 4 USD，执行价均为 20，  
的资产的价格为 18 USD，无风险利率为 2%，将数值代入：

$$c + \frac{X}{(1 + r_f)^T} = 3 + \frac{20}{(1 + 2\%)^{0.25}} = 22.9 \text{ USD}$$
$$p + s = 3 + 18 = 21 \text{ USD}$$

所以  $c + \frac{X}{(1+r_f)^T} > p + s$ ，存在套利机会。卖出看涨期权和无风险债券，买

期权和一股股票，实现套利。因此正确选项为 C。

对于选项 A，套利时看跌期权和标的资产的交易方向相同，看涨期权和债券  
易方向相同。因此，该选项错误。

对于选项 B，套利时看跌期权和标的资产的交易方向相同，看涨期权和债券  
易方向相同。因此，该选项错误。

对于选项 D，买入看涨期权和无风险债券，卖出看跌期权和一股股票的交  
错误，无法实现套利。因此，该选项错误。

58. Asian options provide a payoff dependent on an arithmetic average of the underlying asset price during the life of the option. The average price is usually calculated using periodic observations. Suppose K is the strike price, ST is the final asset price, and Save is the average asset price. What is the payoff of a long position in an average price call and a short position in an average price put?

A.

$$K - S_{ave}$$

B.

$$S_{ave} - K$$

C.

本题考查期权交易策略。

宽跨式的多头构建方式为，买入一份行权价格高的看涨期权，买入一份行权价格低的看跌期权，两份期权对应的到期日相同，底层标的资产相同。看涨期权费 $C_0 = \$2$ ，看跌期权的期权费 $P_0 = \$1$ ，盈亏平衡点：

$$BEP_1 = X_{call} + (C_0 + P_0) = \$10 + (\$2 + \$1) = \$13$$

$$BEP_2 = X_{put} - (C_0 + P_0) = \$8 - (\$2 + \$1) = \$5$$

因此正确选项为 A。

对于 B 选项，日历价差策略的空头构建方式为，卖出一份到期日长的看涨期权同时买入一份到期日短的看涨期权，两份期权的行权价相同，对应底层标的资产相同。因此，该选项错误。

对于 C 选项，跨式策略的空头构建方式为，卖出一份看涨期权，卖出一份看跌期权，两份期权对应的行权价、到期日和底层标的资产均相同。因此，该选项错误。

对于 D 选项，熊市价差策略的多头头寸，随着股价下跌该策略逐渐获利，但该策略的获利和亏损空间均有限。因此，该选项错误。

$$\text{Max}(S_{ave} - K, K - S_{ave})$$

D.

$$\text{Min}(S_{ave} - K, K - S_{ave})$$

参考答案：B

【莽学解析】

59. Barrier options have payoffs that depend on whether the asset price reaches a particular barrier. Options that cease to exist when a barrier is reached are sometimes referred to as knockout options, whereas options that come into existence when a barrier is reached are referred to as knock-in options. Which of the following statements about barrier options is most incorrect?

- A. Barrier options can be attractive to market participants because they are less expensive than regular options.
- B. As with binary options and gap options, the payoff of barrier options is discontinuous.
- C. Like regular options, barrier options prices increase as volatility increases.
- D. A down-and-out call with a strike price of USD 32 and a barrier at USD 27 will provide the

same payoff as a regular call with a strike price of USD 32 as long as the stock price does not fall below USD 27.

参考答案: C

【莽学解析】本题考查障碍期权的性质。障碍期权的价值并不一定随着标的资产的波动率增加而增加，当敲出期权接近障碍价格时，波动率的增加可能会降低期权的价值，因为增加了触及障碍价格导致期权失效的可能性。因此C选项描述错误，符合题意，为正确选项。对于选项A，障碍期权相较于普通期权而言有更多的限制，对投资者不利，所以价格会比普通期权更加便宜。因此，该选项描述正确，不符合题意，为错误选项。对于选项B，障碍期权的损益以障碍价格为分界点会呈现出不连续的情况，两值期权的损益以行权价为分界点会呈现跳跃性，并不是连续的，缺口期权的执行价和触发价不一致时，损益也会呈现跳跃性。因此，该选项描述正确，不符合题意，为错误选项。对于选项D，向下敲出的障碍看涨期权的执行价为32，障碍价格为27，当标的资产的价格高于27时并不会导致期权失效，此期权和普通的看涨期权无异。因此，该选项描述正确，不符合题意，为错误选项。

60. Considering ALIBABA corporation which the stock price of no-dividend paying is currently trading at USD 30, and its annual price volatility is 30%. The continuously compounding risk-free interest rate is 5% per year. A financial risk manager is considering a two-step binomial tree for a 2-year horizon. What is the price of the American put option with the strike price of USD 33?

- A. 5.7042
- B. \$4.9537
- C. \$2.5706
- D. \$4.6698

参考答案: A

【莽学解析】

本题考查美式期权两步二叉树的计算。依据题意，美式看跌期权可能会提前行权，因此求期望折现后，需要和同一节点立即行权的payoff进行比较。计算步骤如下：step1，计算上涨和下跌因子：

$$u = e^{\sigma\sqrt{t}} = 1.3499$$

$$d = \frac{1}{u} = 0.7408$$

step2，算最后一期每个节点期权的payoff:

$$P_{uu} = \max(0, X - S_0 \times u \times u) = \max(0, 33 - 30 \times 1.3499 \times 1.3499) = \$0$$

$$P_{ud} = \max(0, X - S_0 \times u \times d) = \max\left(0, 33 - 30 \times 1.3499 \times \frac{1}{1.3499}\right) = \$3$$

$$P_{dd} = \max(0, X - S_0 \times d \times d) = \max\left(0, 33 - 30 \times \frac{1}{1.3499} \times \frac{1}{1.3499}\right) \\ = \$16.5365$$

step3，计算风险中性上涨和下跌概率：

$$\pi_u = \frac{e^{rt} - d}{u - d} = \frac{e^{0.05} - d}{u - d} = 0.5097$$
$$\pi_d = 1 - \pi_u = 0.4903$$

step4，求出期望价值，往前折现，并比较每个节点处期权价值的现值与期权立即行权的payoff大小：

$$P_u = (P_{uu} \times \pi_u + P_{ud} \times \pi_d) \times e^{-rt} = (0 \times 0.5097 + 3 \times 0.4903) \times e^{-5\%} \\ = \$1.3992$$

此节点立即行权的价值为负，所以此节点不会提前行权；

$$P_d = (P_{ud} \times \pi_u + P_{dd} \times \pi_d) \times e^{-rt} = (3 \times 0.5097 + 16.5365 \times 0.4903) \times e^{-5\%} \\ = \$9.1669$$

此节点立即行权价值为  $X - S_0 d = 10.7760$ ，所以此节点会提前行权，即  $P_d = \$10.7760$ ；

$$P_0 = (P_u \times \pi_u + P_d \times \pi_d) \times e^{-rt} \\ = (1.3992 \times 0.5097 + 10.7760 \times 0.4903) \times e^{-5\%} = \$5.7042$$

此节点立即行权价值为  $X - S_0 = 3$ ，所以此节点不会提前行权，即  $P_0 = \$5.7042$ ，因此正确选项为 A。

61. A no-arbitrage argument is a useful method for valuing American and European options. Which the following statement about the no-arbitrage argument is least likely correct?

- A. It is not suitable for put-call parity.
- B. Option can be used for hedging risky assets.
- C. The probability of upward movement was not required to be known.
- D. The risk-neutral valuation model can be derived from the no-arbitrage argument.

参考答案: A

【莽学解析】本题考查衍生品的无套利定价理论。无套利理论也适用于put-call parity, 看涨期权和无风险资产构成的组合与看跌期权和标的资产构成的组合价值相等, 否则将存在套利机会。选项A描述错误, 符合题意, 为正确选项。对于选项B, 期权可以用来对冲风险资产, 通过将风险资产与期权组合, 行成一个无风险的投资组合, 从而实现期权的定价。因此, 该选项描述正确, 不符合题意, 为错误选项。对于选项C, 无套利模型中不需要标的资产的上涨和下跌概率, 风险中性的定价模型需要计算标的资产的上涨和下跌概率。因此, 该选项描述正确, 不符合题意, 为错误选项。对于选项D, 风险中性定价模型可以由无套利理论推导出来, 两种模型给出的结果是相同的。因此, 该选项描述正确, 不符合题意, 为错误选项。

62. A hedge fund has USD 100 million of investors' funds and its fees are 2 plus 20%. The fund manager chooses a highly risky strategy that has a 50% chance of producing a profit of USD 30 million and a 50% chance of a loss of USD 12 million. The hurdle rate is 4% and the management fees are based on the beginning of the asset. What is the net expected return to the investor?

- A. \$9.0 million
- B. \$4.4 million
- C. \$4.6 million
- D. \$4.2 million

参考答案: C

【莽学解析】

本题考查对冲基金的费率计算。

对冲基金的总收益为:

$$50\% \times 30 + 50\% \times (-12) = \$9 \text{ million}$$

在计算对冲基金的总费率时, 需要分情况讨论, 并考虑最低收益要求, 盈利情况下的总费率为:

$$100 \times 2\% + (30 - 100 \times 2\% - 100 \times 4\%) \times 20\% = \$6.8 \text{ million}$$

亏损情况下的总费率为:

$$100 \times 2\% = \$2 \text{ million}$$

对冲基金的预期总费率为:

$$6.8 \times 50\% + 2 \times 50\% = \$4.4 \text{ million}$$

投资者获得的净收益为对冲金的总收益减去总费率:

$$9 - 4.4 = \$4.6 \text{ million}$$

因此, 正确选项为 C。

63. The information of hedge funds are less transparent than mutual funds and often employ a variety of trading strategies to achieve higher returns. The common trading strategies are dedicated short, merger arbitrage, emerging markets, global macro, etc. Which of the following

statements about this trading strategies is most incorrect?

- A. A dedicated short fund devotes its attention to picking overvalued stocks and it doesn't hedge against the overall performance of the market.
- B. Merger arbitrage strategies are based on the experience that the share price of the target company usually increases, but not to the price being offered.
- C. Hedge funds that specialize in emerging markets could use American Depository Receipts (ADRs), which are certificates backed by shares of a foreign company and traded on an exchange in the United States.
- D. Almost all global macro trades are successful because economies will not remain in disequilibrium for long periods of time.

参考答案: D

**【莽学解析】**本题考查对冲基金的交易策略。采用全球宏观策略的对冲基金经理进行的交易反映了全球经济的走向，他们试图寻求市场因某种原因脱离其平衡点的情形，并且对经济状态会返回平衡状态下赌注。这种策略重要问题是，基金经理并不知道经济平衡会在何时恢复，由于某种原因，全球经济市场可能长时间持续不平衡状态。因此D选项描述错误，符合题意，为正确选项。对于选项A，专门的空头基金专注于挑选被高估的股票进行做空，并不会对冲市场的整体表现。因此，该选项描述正确，不符合题意，为错误选项。对于选项B，并购套利交易往往在兼并和收购消息公布后进行，同时寄希望于并购交易达成。从经验上看目标公司的股价通常会上涨，但不会涨至并购方提供的价格。因此，该选项描述正确，不符合题意，为错误选项。对于选项C，新兴市场基金专注于发展中国家的投资，可以使用美国存托凭证，它是美国金融机构为协助外国证券在美国交易而发行的一种可转让证书。美国存托凭证的价格与外国公司股票价格之间的任何差异都可能导致套利机会。因此，该选项描述正确，不符合题意，为错误选项。

64. X, Y, and Z have entered into many derivative transactions. When transactions between X and Y are netted, the net value to X is 60. When transactions between Y and Z are netted, the net value to Y is 70. When transactions between Z and X are netted, the net value to Z is 80. Suppose that all transactions are cleared through a CCP rather than bilaterally. What is the net position of X?

- A. 20
- B. -20
- C. 10
- D. -10

参考答案: B

【莽学解析】本题考查中央清算下交易会员的敞口计算。X和Y双边净额结算后的净头寸为X收入60，Y和Z双边净额结算后的净头寸为Y收入70，Z和X双边净额结算后的净头寸为Z收入80。当三方采用中央清算后，X收入60和支出80，最终为净支出20。因此正确选项为B。

65. The new derivatives regulations do nothing more than replace too-big-to-fail banks with too-big-to-fail CCPs. It certainly would be a disaster for the financial system if a major CCP were to fail. Which of the following statements about the risk faced by CCP is most incorrect?
- A. One significant problem with CCPs is that there is a positive correlation among member defaults.
  - B. CCPs treat all members in the same manner when calculating initial margin and default fund contributions.
  - C. The auction processes for closing out defaulting members would always success in any turbulent markets.
  - D. CCPs are faced with a trade-off between the return it gets by investing initial margin and the liquidity constraints of its investments.

参考答案: C

【莽学解析】本题考查CCP面临的风险。拍卖违约会员的合约失败是CCP面临的风险之一，尤其是在动荡的市场环境下，拍卖会更加困难，并不能保证一定会拍卖成功。因此C选项描述错误，符合题意，为正确选项。对于选项A，违约会员之间的相关性较强会引起大量的违约，对于CCP会造成较大的负面影响，是CCP面临的风险之一。因此，该选项描述正确，不符合题意，为错误选项。对于选项B，CCP针对所有的会员按照相同的标准收取初始保证金和违约基金，无法反映会员真实的风险情况，是CCP面临的风险之一。因此，该选项描述正确，不符合题意，为错误选项。对于选项D，CCP可以将会员缴纳的初始保证金用于投资赚取收益，但需要在获取投资收益和满足日常资金需求之间做权衡，即CCP会面临流动性风险。因此，该选项描述正确，不符合题意，为错误选项。