Valuation and Risk Models

单项选择题

1.The term structure of swap rates is: 0.60% at 1 year; 0.90% at 2 years; 1.00% at 3 years; 2.20% at 4 years; 3.10% at 5 years. What is the two-year forward swap rate starting in three years, F(3,5), under respectively, semi-annual (s.a.) and annual compounding?

A.4.89% (s.a.) and 5.07% (annual)

B.5.25% (s.a.) and 5.22% (annual)

C.6.29% (s.a.) and 6.33% (annual)

D.7.03% (s.a.) and 7.14% (annual)

参考答案：C

【莽学解析】SemiannualF(3,5) = ([(1+3.1%/2)^(5×2)/(1+1%/2)^(3×2)]^(1/4)-1)×2 = 6.291%Annual F(3,5) = SQRT(1.031^5/1.01^3)-1 = 6.332%

2.A fixed rate bond, currently priced at 102.9, has one year remaining to maturity and is paying an 8% coupon. Assuming the coupon is paid semiannually, what is the yield of the bond?

A.8%

B.7.77%

C.6%

D.5%

参考答案：D

【莽学解析】Answer: DUsing a bond calculator, PV = -102.9; FV = I00; N = 2; PMT = 4. Solving for I/Y we get 2.4955% × 2 = 5%.使用债券计算器，PV = -102.9;FV= I00;N = 2;PMT = 4。求I/Y，得到2.4955%×2 = 5%。

3.You have been asked to check for arbitrage opportunities in the Treasury bond market by comparing the cash flows of selected bonds with the cash flows of combinations of other bonds. If a 1-year zero-coupon bond is priced at USD 96.12 and a 1-year bond paying a 10% coupon semiannually is priced at USD 106.20, what should be the price of a 1-year Treasury bond that pays a coupon of 8% semiannually?

A.USD 98.10

B.USD 101.23

C.USD 103.35

D.USD 104.18

参考答案：D

【莽学解析】

Answer: D

The solution is to replicate the 1 year 8% bond using the other two treasury bonds.

	Price	Cash Flow (t = 0.5)	Cash Flow (t = 1)	Replicating Weight
Bond 1	96.12	0	100	0.2
Bond 2	106.20	5	105	0.8
Bond 3		4	104	

Therefore, the price of the 8% bond should be 0.2 × 96.12 0.8 × 106.20 = 104.184

4.An investor buys $10,000 face amount of the U.S. Treasury 6 1/2 (coupon rate = 6.50%) of August 15, 2017, for settlement on July 1st, 2014. The last coupon paid on February 15, 2014 and the next coupon pays on August 15, 2014. The bond's yield to maturity happens to be 4.00%. What is nearest to the bond's quoted price at settlement? (this adds a level of difficulty by not giving you the invoice price)

A.$9,338.48

B.$9,904.15

C.$10,095.07

D.$10,726.83

参考答案：D

【莽学解析】We first need the invoice price. We can price the bond as of the last coupon date: PV (at 2/15/2014) = -PV(2.0%, 7, 325, 10000) = $10,809.00,with the calculator: n = 7, I/Y = 2, PMT = 325, FV = 10000 --> CPT PV = $10,809.00Note, from 2/15/14 to 8/15/17 is 3.5 years or 7.0 semesters.Then we can compound this forward to settlement date, with the given yield, such that:Invoice (aka, Full) Price = PV(at 7/1/2014) = $10,809.00 × (1+4%/2) ^ (136/181) = $10,971.03.Finally, we extract the bond's quoted price:As AI = $10,000 × 6.5%/2 × 136/181 = $244.20,Quoted Price = Invoice Price - AI = $10,971.03 - $244.20 = $10,726.83.这道题的计算过程如下：

5.The six-month and one-year discount factors are, respectively, d(0.5) = 0.9920 and d(1.0) = 0.9760. What is the implied six-month forward rate, under semi-annual compounding?

A.2.34%

B.3.28%

C.3.95%

D.4.01%

参考答案：B

【莽学解析】The solution is as follows: (0.9920/0.9760-1)×2 = 3.279%这道题的计算如下：(0.9920/0.9760-1)×2 = 3.279%

6.The price of a six-month zero-coupon bond (bill) is $99.90 and the price of a one-year zero-coupon bond is $98.56. What is the implied six-month forward rate, under semi-annual compounding?

A.1.30%

B.2.95%

C.2.72%

D.3.08%

参考答案：C

【莽学解析】The solution is as follows:(99.90/98.56-1)×2 = 2.719%这个题的是：(99.90/98.56-1)×2 = 2.719%

7.The yield curve is upward sloping. You have a short T-Bond interest rate futures position. The following bonds are eligible for delivery:

The futures price is 103 - 17/32 and the maturity date of the contract is September 1. The bonds pay their coupon amount semiannually on June 30 and December 31. With these data, the cheapest-to-deliver bond is:

Bonds	Spot-price (USD)	Conversion Factor	Coupon Rate
A	102.44	0.98	4%
B	106.59	1.03	5%
C	98.38	0.95	3%

A. BondA
B. Bond B
C. Bond C
D. Insufficient information to determine
参考答案：B
【莽学解析】The bond with the lowest net cost is called cheapest to deliver. Cost=Price-Futures Quote×Conversion FactorCost_A=102.44-(103+17/32)×0.98=0.98. Cost_B=106.59-(103+17/32)×1.03=-0.05. Cost_C=98.38-(103+17/32)×0.95=0.03So, bond B is the cheapest to deliver bond. 净成本最低的债券是最便宜的可交割债券 成本=价格-期货报价×转换因子 CostA=102.44-(103 17/32)×0.98=0.98 CostB=106.59-(103 17/32)×1.03=-0.05 CostC=98.38-(103 17/32)×0.95=0.03 因此，债券B是最便宜的债券

8. Prior to the recent 2007 financial crisis, stress testing was primarily based on which of the following characteristics? Ⅰ. Significant system-wide correlations. Ⅱ. Historical or hypothetical scenarios.
A. I only.
B. II only.
C. Neither I nor II.
D. Both I and II.
参考答案：B
【莽学解析】Recent turmoil revealed numerous weaknesses in banks, stress caking practices, such lack of proper recognition of extreme shocks and presence of significant system-wide correlations (feedback and spillover effects) between different markets, risks, and portfolio positions. Shorter test durations and historical or hypothetical scenario-based testing were key weaknesses in stress testing practices. Actual events showed longer duration of stress conditions and breakdown of historical statistical relationships.最近的动荡暴露了银行的许多弱点，压力固化的做法，如缺乏对极端冲击的正确认识，以及在不同市场、风险和投资组合头寸之间存在显著的系统相关性(反馈和溢出效应)。较短的测试持续时间和基于历史或假想场景的测试是压力测试实践中的关键弱点。实际事件显示了更长的持续时间的压力条件和打破历史统计关系。

9. The option-adjusted duration of a convertible bond will be close to the duration of a straight bond, which is similar in all other respects, when the:
A. Stock price is extremely low.
B. Stock price is extremely high.
C. Interest rates are extremely low.
D. Interest rate volatility is extremely high.
参考答案：A
【莽学解析】When the stock price is extremely low, the option to convert is likely to have

little value, and the convertible bond will trade effectively as a straight bond.当股票价格极低时，转换期权的价值可能很小，可转换债券将作为直接债券有效交易。

10.An asset manager at an insurance company is considering making a fixed income investment and holding it for 2 years. The manager is comparing two bond issues that have equal yield to maturity at origination. One is a semi-annual coupon bond paying 7%, maturing in 2 years, and priced at USD 101.86. The other is a zero- coupon bond, also maturing in 2 years, and priced at USD 88.85. The manager is uncertain about the outlook for interest rates over the next two years but will incorporate the forecast of the company's economist when making the investment decision. Assuming no default risk, tax implications, or liquidity constraints, which of the following statements is correct?

A.The manager should be indifferent between the bonds if the interest rate is expected to rise since both bonds have the same yield and cash flows.

B.The manager should prefer the zero-coupon bond if the interest rate is expected to rise in the future.

C.The manager should prefer the zero-coupon bond if the expected average interest rate over the next 2 years is less than 6%.

D.The manager should prefer the coupon bond if the expected average interest rate over the next 2 years is less than 6%.

参考答案：C

【莽学解析】C is correct. The current annual yield on both the coupon and zero-coupon bonds are the same at 6% If rates are higher than 6% then the coupon bond would be preferred due to higher reinvestment income.A is incorrect. If the interest rate are expected to rise, coupon bonds would be more attractive because investors can reinvest the coupon at higher interest rates.B is incorrect. If the interest rate are expected to rise, coupon bonds would be more attractive because investors can reinvest the coupon at higher interest rates.D is incorrect. Falling interest rates below the yield to maturity would mean lower reinvestment income for the coupon bond, which makes the coupon bond less attractive.目前息票债券和零息债券的年收益率相同，都是6%。如果利率高于6%，那么息票债券会因为更高的再投资收益而成为首选。一个是不正确的。如果预期利率将上升，息票债券将更具吸引力，因为投资者可以将息票以更高的利率进行再投资。B是不正确的。如果预期利率将上升，息票债券将更具吸引力，因为投资者可以将息票以更高的利率进行再投资。D是不正确的。利率低于到期收益率将意味着息票债券的再投资收入降低，从而降低息票债券的吸引力。

11.Exactly one year ago, Sally purchased a $100.00 face value bond that pays a semiannual coupon with a coupon rate of 9.0% per annum. When she purchased the bond, it had a maturity of 10.0 years and its yield to maturity (YTM; aka, yield) was 6.00%. If the bond's price today happens to be unchanged from one year ago (when she purchased the bond), which of the following is nearest to the bond's yield (yield to maturity) today?

A.5.57%

B.5.78%

C.6.00%

D.6.22%

参考答案：B

【莽学解析】When Sally initially purchased the bond its price was equal to =-PV(0.060/2, 10×2, $100×0.090/2, 100) = $122.3162. If the price is unchanged, then one year later (i.e., N - 2 periods), the yield is given by RATE(9×2, $100×0.090/2, -122.3162, 100)×2 = 5.7843%. Using

the TI BA II calculator: 20 N, 3 I/Y, 4.5 PMT, 100 FV and CPT PV = -122.3162, then we only need to change the periods with 18 N, CPT I/Y [display: I/Y = 2.8922] × 2 = 5.7843%.当Sally最初购买债券时，其价格等于=-PV(0.060/2, 10×2, $100×0.090/2, 100) = $122.3162。如果价格没有变化，则一年后（即N - 2期），收益率将以RATE（9×2，$ 100×0.090 / 2，-122.3162，100）×2 = 5.7843%。使用TI BA II 计算器：20 N，3 I / Y，4.5 PMT，100 FV和CPT PV = -122.3162，那么我们只需要将周期更改为18 N，CPT I / Y [显示：I / Y = 2.8922]×2 = 5.7843%。

12.Which of the following statements is TRUE about the role of internal audit in stress testing governance?

A.Internal audit should independently assess each stress test used

B.Internal audit is the "first line of defense" in stress testing governance

C.Internal audit should have full knowledge of all stress-test details

D.Internal audit should assess the expertise and roles and responsibilities of the staff involved in stress-testing activities

参考答案：D

【莽学解析】Internal audit should assess the expertise and roles and responsibilities of the staff involved in stress-testing activities内部审计应评估参与压力测试活动的人员的专业知识，作用和职责

13.Use the following information to answer the question

Maturity (Years)	Strip Price	Spot Rate	Forward Rate
0.5	99.2556	1.50%	1.50%
1.0	98.2240	1.80%	2.10%
1.5	96.7713	2.20%	?
2.0	95.1524	?	3.40%

The 6-month forward rate on an investment that matures in 1.5 years is closest to:

A.2.50%

B.2.75%

C.3.00%

D.3.25%

参考答案：C

【莽学解析】The solution is as follows:

$$\left(1+\frac{1.8\%}{2}\right)^{2}\times\left(1+\frac{F}{2}\right)^{1}=\left(1+\frac{2.2\%}{2}\right)^{3}\Rightarrow F=3\%$$

14.Assuming the 92-day and 274-day interest rate is 8% (act/360, money market yield) compute the 182-day forward rate starting in 92 days (act/360, money market yield).

A.7.8%
B.8.0%
C.8.2%
D.8.4%
参考答案：B
【莽学解析】Because the two spot rates are equal to 8 percent, the implied forward rate also has to be 8 percent. 由于两个即期汇率等于8%，因此隐含的远期汇率也必须为8%。

15.A $10 million Treasury bond (note) with a 10-year maturity pays semi-annual coupons at a coupon rate of 4.0% per annum. If the bond is fully "stripped" such that STRIPS are created, each of the following is TRUE except:
A.The stripping creates 21 zero-coupon bonds
B.Each of the C-STRIPS and the P-STRIP implies an exact spot (a.k.a., zero) interest rate
C.The duration of the P-STRIP is greater than the duration of the original Treasury bond
D.The C-STRIPS each have durations near to zero
参考答案：D
【莽学解析】The C-STRIPS are not floating-rate notes, they are zero-coupon bonds corresponding to the respective coupons. So, in this case, the twenty C-STRIPS have Macaulay durations of: 0.5, 1.0, 1.5,....In regard to (A), (B), and (C), each is TRUE about the STRIPS.In regard to (A), the bonds twenty coupons (10 years × 2 coupons/year) create 20 CSTRIPS plus the principal repayment creates a single P-STRIP. C.STRIPS不是浮动利率票据，它们是对应于各个息票的零息债券。因此，在这种情况下，二十个C.STRIPS的Macaulay持续时间为：0.5、1.0、1.5，...。 关于（A），（B）和（C），关于STRIPS每个都是正确的。 关于（A），债券二十张息票（10年×2张息票/年）创建20个CSTRIPS，加上本金还款创建单个P.STRIP。

16.Each of the following is necessarily TRUE about a bond's yield-to-maturity (YTM) EXCEPT:
A.A bond that sells at a premium to par has a yield (YTM) that is less than its coupon rate
B.A bond that sells at a discount to par has a yield (YTM) that is greater than its coupon rate
C.The yield (YTM) of a zero-coupon bond equals the spot (zero) rate of the bond's maturity
D.If the same term structure of spot rates applies to two bonds with identical maturities, the bond with the higher yield (YTM) is a superior investment
参考答案：D
【莽学解析】This ignores the coupon effect. Fairly prices bonds will have various yields.In regard to (A), (B), and (C), each is TRUE. 这忽略了息票效应。 价格公允的债券将有不同的收益率。关于（A），（B）和（C），每个都是正确的

17.Assume the upward-sloping 2-year theoretical spot rate curve, and associated discount factors, below: Consider three bonds with identical par value of $100 and maturity of two years:
Bond I is a zero-coupon bond
Bond II pays a semi-annual 2.0% coupon
Bond III pays a semi-annual 4.0% coupon

From lowest to highest, what is the order of their yields-to-maturity (YTM)?
A.YTM(I)＜II＜YTM(III)
B.I = II = III (same YTM)

C. III＜II＜I

D. Unclear without more information.

参考答案：C

【莽学解析】4% coupon bond has lowest and zero-coupon has highest yield. This is the "coupon effect:" we don't really need to price them. The yield of the zero-coupon bond equals the 2-year spot rate of 1.9465% because it discounts only a single cash flow, then the yield decreases as the coupon increases 4%息票债券的收益率最低，零息债券的收益率最高。 这就是“票息效应”：我们实际上不需要为它们定价。 零息债券的收益率等于2年期即期利率1.9465%，因为它仅折现单一现金流量，然后收益率随着息票增加而下降

18. Consider the following, a 7-year zero-coupon bond carries an annual yield of 6.75% and a 6-year zero coupon bond carries an annual yield of 5.87%. Calculate the 1 year forward rate 6 years from now. Assume annual compounding.

A. 6.31%

B. 12.03%

C. 12.19%

D. 12.62%

参考答案：C

【莽学解析】The solution is as follows:

$$(1+6.75\%)^7=(1+5.87\%)^6\times(1+F_{6,7})\Rightarrow F_{6,7}=12.19\%$$

19. Relative to coupon-bearing bonds of same maturity, zero-coupon bonds are not subject to which type of risk?

A. Interest rate risk

B. Credit risk

C. Reinvestment risk

D. Liquidity risk

参考答案：C

【莽学解析】Since zero-coupon bonds have no coupons, there is nothing to reinvest. They are subject to all of the other risks listed, however.由于零息债券没有息票，因此没有任何可再投资的内容。

20. For purposes of computing the market risk of a US Treasury Bond portfolio, it is easiest to measure:

A. Yield volatility because yields have positive skewness.

B. Price volatility because bond prices are positively correlated.

C. Yield volatility for bonds sold at a discount and price volatility for bonds sold at a premium to par.

D. Yield volatility because it remains more constant over time than price volatility, which must approach zero as the bond approaches maturity.

参考答案：D

【莽学解析】Because prices must converge to the bond's maturity value, the volatility of yields provides a more accurate risk assessment.由于价格必须收敛到债券的到期价值，因此收益率的波动性可

以提供更准确的风险评估。

21.Peter paid $93.40 to purchase a bond on June 1st, 2018; the bond pays a semi-annual coupon with a coupon rate of 3.0% per annum and matures in 10.0 years on June 1st, 2028. One year later, on June 1st, 2019, the bond's yield is unchanged; aka, unchanged yield assumption. Peter can reinvest his received coupons at a rate of 4.0% per annum. If Peter were to sell the bond on June 1st, 2019, which of the following is nearest to his gross realized return over the one year period since he purchased the bond?
A.-1.09%
B.2.50%
C.3.84%
D.4.11%
参考答案：C
【莽学解析】3.84% (or more exactly 3.83718%) is the gross realized return, which includes one reinvested (at 4.0%) coupon.At the time of purchase, when the bond's price was $93.40, its yield was = RATE(10×2,100×0.030/2,-93.40,100)×2 ~= 3.80%. After one year, if the yield is unchanged, then we only need to re-price with a shorter maturity such that the price is PV(0.0380/2,9×2,100×0.030/2,100) = $93.954. Notice how the bond pulled to par. The gross realizes return includes the interim coupon compounded for six months at 4.0% and, therefore is given by[$93.954 ＋$1.50＋ $1.50×(1 0.040/2)－93.40]/93.40= 3.8372%. 3.84% (更精确些3.83718%)是已实现的总回报，其中包括一张再投资（利率为4.0%）的息票。在购买时，债券的价格为$93.4，他的YTM = RATE(10×2, 100×0.030/2, －93.40, 100)×2= 3.80%。一年后，如果利率不变，我只需要以较短的到期日重新定价，价格为PV(0.0380/2, 9×2, 100×0.030/2, 100)= $93.954。请注意债券如何拉到面值。 总实现回报包括以4.0%的比例计息六个月的中期息票率为4%，计算过程为[$93.954 ＋$1.50＋ $1.50×(1 0.040/2)－93.40]/93.40= 3.8372%.

22.Each of the following is necessarily true about a bond's yield (YTM) EXCEPT:
A.If the term structure of spot rates is flat at X%, a bond's yield must be also be X%
B.Regardless of the slope of the term structure (e.g., upward- or downward-sloping) and number of spot rates, the yield (YTM) is a single value
C.The yield on a coupon-paying bond is sensitive to (i.e., will change in response to) a change in spot rates at specific maturities
D.For a given bond with a fixed coupon rate, an increase in the bond's maturity implies a decrease in the bond's yield (YTM)
参考答案：D
【莽学解析】This is only true for a discounted bond; in the case of a premium-priced bond, the yield increases with maturity. 这仅适用于折价债券； 对于高价债券，收益率随着到期日的增加而增加。

23.Which of the following bonds offers the highest yield (YTM)?
A.7-year bond with a 3% coupon trading at par
B.20-year bond with a 4% coupon trading at a 15% premium to par
C.10-year bond with 4% coupon trading at a 15% discount to par
D.15-year bond with a 4% coupon trading at a 15% discount to par
参考答案：C
【莽学解析】10-year bond with 4% coupon trading at a 15% discount to par In regard to (A), this

bond trades at par so its yield must equal its coupon of 3% In regard to (B), this bond trades at a premium, so it's yield must be less than its coupon of 4%. The bonds in both (C) and (D) must have yields greater than their 4% coupon; however, the 10-year bond returns the 15% discount faster, so its yield is higher. 10年期债券，票面利率为15%的折扣，票面利率为4% 关于（A），该债券按面值交易，因此其收益率必须等于其票面利率的3% 关于（B），该债券以溢价交易，因此其收益率必须低于其票面利率的4%。 （C）和（D）中的债券的收益率必须大于其4%的息票； 但是，10年期债券的折价收益率提高了15%，因此收益率更高。

24.Assume the following discount function, which is a set of discount factors: d(0.5) = 0.990, d(1.0) = 0.970, d(1.5) = 0.960, d(2.0) = 0.950. A U.S. Treasury bond pays a semi-annual coupon at a rate of 5.0% per annum and matures with a face value of $1,000 in eighteen months (T = 1.5 years). What is the price of the bond?

A.$985.00

B.$1,002.00

C.$1,015.00

D.$1,033.00

参考答案：D

【莽学解析】The solution follows：Price = $25×0.990+$25×0.970+$1,025×0.960 = $1,033这道题的如下：Price = $25×0.990 $25×0.970 $1,025×0.960 = $1,033

25.The spot rate term structure is upward-sloping: 1.0% at 0.5 years, 2.0% at 1.0 years, 3.0% at 1.5 years, and 4.0% at 2.0 years. What is the price of two-year $100 face value bond that pays a semi-annual coupon with a 6.0% per annum coupon rate?

A.$99.74

B.$101.67

C.$102.27

D.$103.95

参考答案：D

【莽学解析】PV (0.5 year cash flow) = $3/(1＋1%/2)^(0.5×2) = $2.99PV (1.0 year cash flow) = $3/(1＋2%/2)^(1.0×2) = $2.94PV (1.5 year cash flow) = $3/(1＋3%/2)^(1.5×2) = $2.87PV (2.0 year cash flow) = $103/(1＋4%/2)^(2.0×2) = $95.16Sum of PV of cash flows = $103.951 第0.5年的现金流的现值PV (0.5 year cash flow) = $3/(1＋1%/2)^(0.5×2) = $2.99 第1年的现金流的现值PV (1.0 year cash flow) = $3/(1＋2%/2)^(1.0×2) = $2.94 第1.5年的现金流的现值PV (1.5 year cash flow) = $3/(1＋3%/2)^(1.5×2) = $2.87 第2年的现金流的现值PV (2.0 year cash flow) = $103/(1＋4%/2)^(2.0×2) = $95.16 总现金流的现值 = $103.951

26.The price of a six-month zero-coupon bond is $99.90 and the price of a one-year zero-coupon bond is $98.56. What is the implied six-month forward rate, under semi-annual compounding?

A.1.30%

B.2.95%

C.2.72%

D.3.08%

参考答案：C

【莽学解析】Answer:C

$$\frac{100}{\left(1+\frac{Z_{0.5}}{2}\right)}=99.9$$

$$\frac{100}{\left(1+\frac{Z_1}{2}\right)^2}=98.56$$

$$\left(1+\frac{Z_{0.5}}{2}\right)\left(1+\frac{f_{0.5-1}}{2}\right)=\left(1+\frac{Z_1}{2}\right)^2$$

$$f_{0.5-1}=2.72\%$$

27. The price of a $1,000 par value Treasury bond (T-Bond) with a 3% coupon that matures in 1.5 years is closest to:

Maturity (Years)	Strip Price
0.5	99.2556
1.0	98.2240
1.5	96.7713
2.0	95.1524

A. $1,010.02
B. $1,011.85
C. $1,013.68
D. $1,015.51
参考答案：B
【莽学解析】15 × 0.992556 + 15 × 0.982240 + 1015 × 0.967713 = 1,011.8515 × 0.992556 ＋15 × 0.982240 1015 × 0.967713 = 1,011.85

28. If the spot rate term structure is flat, what is true of the discount function (i.e., the set of discount factors) as function of maturity?
A. Flat
B. Increasing with maturity
C. Decreasing with maturity
D. Insufficient information: we need the yield (YTM) to answer
参考答案：C

【莽学解析】Greater maturity requires more discounting. For example if the spot rate term structure is flat at 5%, then semi-annual discount function is: d(0.5) = 0.9756, d(1.0) = 0.9518, d(1.5) = 0.9286 ...In regard to (D), please note that a flat spot/zero term structure is the special case where the yield must match; e.g., flat spot rates at 5% imply yield must also be 5%. 到期日更长则折扣率越高。若即期汇率的期限结构一直是5%，则半年的折扣函数为：d(0.5) = 0.9756, d(1.0) = 0.9518, d(1.5) = 0.9286 ... 对于选项D，请注意一个现货/零期限结构是收益必须匹配的特殊情况； 例如，5%的固定现货利率意味着收益率也必须为5%。

29.According to the Principles for sound stress testing practices and supervision by BIS, when is stress testing especially important?

A.When new regulations such as Basel III or Dodd-Frank are introduced and implemented

B.During periods of expansion or long periods of benign economic and financial conditions

C.During a corporate transaction such as a merger, especially if key executive roles are changing

D.Immediately after a market crisis because the standard models will be less useful when systemic input assumptions are depressed

参考答案：B

【莽学解析】During periods of expansion or long periods of benign economic and financial conditionsStress testing is a tool that supplements other risk management approaches and measures. It plays a particularly important role in: providing forward-looking assessments of risk; overcoming limitations of models and historical data; supporting internal and external communication; feeding into capital and liquidity planning procedures; informing the setting of a banks' risk tolerance; and facilitating the development of risk mitigation or contingency plans across a range of stressed conditions. 在扩张时期或长期良好的经济和金融状况下压力测试是补充其他风险管理方法和措施的工具。 它在以下方面起着特别重要的作用：提供前瞻性风险评估；克服模型和历史数据的局限性；支持内部和外部沟通；纳入资本和流动性计划程序；告知银行风险承受能力的设定； 和促进在各种压力条件下制定风险缓解或应急计划。

30.A ten-year bond pays a semi-annual coupon with a coupon rate of 7.0% and the bond's yield (YTM) is 6.0%. If the yield remains unchanged, what happens to the price of the bond in six months?

A.Lower price

B.Same price

C.Higher price

D.Need more information (the initial bond price)

参考答案：A

【莽学解析】As yield ＜ coupon rate, the bond currently trades at a premium to par. With unchanged yield, the price will get "pulled to par" and therefore must decrease. We have enough information to price the bonds, but please note we do NOT need to price the bond if we are familiar with pulling to par concept at 10 years, price = -PV(6%/2, 10×2, $7/2, $100) = $107.44; at 9.5 years, price = -PV(6%/2, 9.5×2, $7/2, $100) = $107.16. 由于收益率＜票息率，该债券目前的交易价格高于面值。 在收益率不变的情况下，价格将被“拉至平价”，因此必须降低。 我们有足够的信息来对债券定价，但是请注意，我们不需要对债券进行定价 在第十年， price = －PV(6%/2, 10×2, $7/2, $100) = $107.44; 在第九年， price = －PV(6%/2, 9.5×2, $7/2, $100) = $107.16.

31.The purchase price of a 3-year 9 percent semiannual coupon bond that is currently yielding 7

percent will be:
A. 105.11
B. 105.25
C. 105.33
D. 105.45
参考答案：C
【莽学解析】Answer: CUsing a bond calculator, N = 6, PMT = -4.5, I/Y = 3.5, FV = -100. Solving for PV we get 105.33.使用债券计算器，N = 6, PMT = -4.5, I/Y = 3.5, FV = -100。求PV，得到105.33。

32. Consider a 7.75% semiannual coupon bond with a par value of $100 and four remaining coupons, which is trading at a yield of 8.375%. There are 74 days remaining in the current period that has a total of 182 days. The accrued coupon of this bond is closest to:
A. 1.59
B. 2.30
C. 3.18
D. 4.57
参考答案：B
【莽学解析】Accrued coupon = (182 - 74)/182 × 7.75%/2 × 100 = 2.2995应计利息= (182 - 74)/182 × 7.75%/2 × 100 = 2.2995

33. You just purchased a ten-year bond at a discount to par. The bond pays a quarterly coupon with a coupon rate of 4.0% per annum; i.e., 1% each quarter. The bond's yield is 8.0% per annum. Your broker says to you, "The 8% yield-to-maturity represents the return you will realize--that is, your realized return--on this bond." Which qualifier or caveat is BEST attached to this assertion?
A. This statement is already true: realized return will equal yield (YTM)
B. The statement is only true if there is no shift in the term structure of spot rates
C. This statement is true if you (the bondholder) hold the bond to maturity: realized return will equal yield (YTM) if the bond is held to maturity
D. This statement is true only if both the bond is held to maturity and the coupons (interim cash flows) are reinvested at the same yield (YTM)
参考答案：D
【莽学解析】We don't expect the ex-post realized return to equal the ex-ante yield (YTM); it is only the case if both the bond is held to maturity and the coupons are reinvested at the same rate. In regard (B), a static zero rate terms structure will not give a realized return equal to yield if the bond is sold before maturity.我们不期望已实现收益等于到期收益率(YTM);只有在债券到期和息票以相同的利率再投资的情况下，才会出现这种情况。如果债券在到期前出售，实现收益率与收益率不等。

34. Peter is given the opportunity to pay $100.00 in exchange for his choice of one of the following annuities: I. The first annuity pays $2.00 per month ($24.00 per annum) over the next five years when the discount rate is 12.0% per annum with monthly compound frequency II. The second annuity pays $18.00 per year over the next ten years when the discount rate is 12.0% annum with annual compound frequency Both annuities pay in arrears; that is, respectively, at the end of each month and at the end of each year. Assuming Peter's discount rate of 12.0% is a

flat curve (i.e., insensitive to maturity) and fully reflects his risk preferences, which of the following statements is TRUE?

A. Neither is worth the cost (the present value of both is below $100.00)

B. The monthly annuity is worth more than the annual annuity

C. The annual annuity is worth more than the monthly annuity

D. Both are worth the cost (the present value of both is above $100.00)

参考答案：C

【莽学解析】the present value (PV) of a stream of $1.00 payments over an annuity of (T) periods is given by A(T) = 1/y ×[1 - 1/(1+y/k)^(k×T)]. Therefore, The PV of the monthly annuity is equal to 1/0.120 ×[1 - 1/(1+0.120/12)^(12×5)]×$24.00 = $89.10, and The PV of the annual annuity is equal to 1/0.120 ×[1 - 1/(1+0.120/1)^(1×10)]×$18.00 = 1/0.120×[1 - 1/(1.120^10)]×$18.00 = $101.704 年金为的$ 1.00付款流的现值（PV）在T时段中是A(T) = 1/y ×[1-1/(1 y/k)^(k×T)]， 因此，每月年金的现值等于：1/0.120 ×[1-1/(1 0.120/12)^(12×5)]×$24.00 = $89.10。 每年年金的现值等于：1/0.120 ×[1-1/(1 0.120/1)^(1×10)]×$18.00 = 1/0.120×[1-1/(1.120^10)]×$18.00 = $101.704。

35. The following discount function contains semi-annual discount factors out to two years: d(0.5) = 0.9970, d(1.0) = 0.9911, d(1.5) = 0.9809, d(2.0) = 0.9706. What is the implied eighteen-month (1.5 year) spot rate (aka, 1.5 year zero rate)?

A. 0.600%

B. 1.176%

C. 1.290%

D. 1.505%

参考答案：C

【莽学解析】

$$r(t) = 2 \times \left[\left(\frac{1}{d(t)}\right)^{\frac{1}{2t}} - 1\right], r(1.5) = 2 \times [(1/0.9809)^{1/3} - 1] = 1.2898\%$$

36. Assume the two-year term structure of spot rates is upward-sloping as follows: 1.0% at 0.5 years, 2.0% at 1.0 years, 3.0% at 1.5 years, 4.0% at 2.0 years. Consider the following two statements: I. The yield (YTM) of a two-year bond cannot be greater than 4.0% (must be less than, or equal to, 4.0%). II. Given a two-year bond, an increase in the coupon rate implies an increase in the yield(YTM) Which of the above statements is (are) TRUE?

A. Neither

B. I. only

C. II. only

D. Both I. and II.

参考答案：B

【莽学解析】I. only. As the yield-to-maturity is a summary of all the spot rates that enter into the bond pricing equation, the yield must be less than the highest spot rate (and greater than the lowest spot rate)In regard to II. This is false: if the term structure of spot rates is increasing, as the coupon increases, generally the yield will decrease.由于到期收益率是所有

进入债券定价方程式的即期利率的总结，因此收益率必须小于最高即期利率（并大于最低即期利率）关于II。 这是错误的：如果即期利率的期限结构在增加，随着息票的增加，收益率通常会下降。

37.A 5-year corporate bond paying an annual coupon of 8% is sold at a price reflecting a yield-to-maturity of 6% per year. One year passes and the interest rates remain unchanged. Assuming a flat term structure and holding all other factors constant, the bond's price during this period will have:
A.increased
B.decreased
C.remained constant
D.cannot be determined with the data given
参考答案：B
【莽学解析】Since YTM is lower than coupon rate, the bond is sold at a premium. As time passes the bond price will move towards par hence the price will decrease由于YTM小于息票率，所以该债券是溢价出售。随着时间的推移，债券价格会向面值靠拢，因此价格会下降。

38.A $1,000 par bond carries a coupon rate of 6%, pays coupons semiannually, and has 12 years remaining to maturity. Market rates are currently 8%. The price of the bond is closest to:
A.$943.61
B.$847.53
C.$1,021.41
D.$952.05
参考答案：B
【莽学解析】Answer: B Using a calculator, note that half a year, number of periods multiplied by 2.使用计算器，注意是半年复利，所以N=12*2=24。

39.Given the following information, which of the following amounts is closest to d (1.0), the discount factor for the first year?

	Bond A	Bond B	Bond C
Bond maturity in years	0.5	1	2
Coupon	6.00%	12.00%	9.00%
Price	101.182	102.341	99.573

A.0.9099
B.0.9138
C.0.9655
D.0.9823
参考答案：A
【莽学解析】Answer: ATo obtain the d(1.0) discount factor, first solve for d(0.5), In the equation below, the price for Bond A is equated to its terminal cash flow in six months, which is the principal plus the semiannual coupon of $3.00.101.182 = 103.00 × d(0.5)d(0.5) = 0.9823Next use the price and cash flows of Bond B to calculate the d(1 .0) discount factor. The cash flow in six months is the semiannual coupon of $6.00 and is discounted by d(0.5). The cash

flow in one year is the principal plus the semiannual coupon of $6.00.102.341 = 6.00 × d(0.5) + 106.00 × d(1.0)102.341 = 6.00 × 0.9823 + 106.00 × d(1.0)d(1.0) = 0.9099要得到d(1.0)折现因子，首先求解d(0.5)，在下式中，债券A的价格等于其六个月的终端现金流，即本金加上每半年的息票$3.00。接下来用债券B的价格和现金流计算d(1 .0)折现系数。六个月的现金流是半年票息6美元，以d(0.5)折现。一年的现金流是本金加上半年票息6美元。= 6.00×102.341×106.00 d (0.5) d(1.0) 102.341 = 6.00×106.00×0.9823 d(1.0)、(1.0)= 0.9099

40.The first U.S. Treasury bond has a price of $99.98, matures in six months, and pays a semi-annual coupon at a rate of 3.0% per annum. The second U.S. Treasury bond has a price of $101.11, matures in one year, and pays a semi-annual coupon at a rate of 4.0% per annum. What are, respectively, the six-month and one-year discount factors?

A.d(0.5) = 0.9790, d(1.0) = 0.9830

B.d(0.5) = 0.9850, d(1.0) = 0.9720

C.d(0.5) = 1.0020, d(1.0) = 0.9830

D.d(0.5) = 0.9650, d(1.0) = 1.0340

参考答案：B

【莽学解析】$99.98=d(0.5)×$101.50,so that d(0.5) = 99.98/101.50 = 0.9850 .$101.11 = d(0.5)×$2.00 + d(1.0)×$102.00, so that d(1.0) = [101.11 - (0.9850 × 2.0)]/102.00 = 0.9720这道题的计算过程如下：

41.You have been asked to check for arbitrage opportunities in the Treasury bond market by comparing the cash flows of selected bonds with the cash flows of combinations of other bonds. If a 1-year zero-coupon bond is priced at USD 96.12 and a 1-year bond paying a 10% coupon semi-annually is priced at USD 106.20, what should be the price of a 1-year Treasury bond that pays a coupon of 8% semiannually?

A.USD 98.10

B.USD 101.23

C.USD 103.35

D.USD 104.18

参考答案：D

【莽学解析】The solution is to replicate the 1 year 8% bond using the other two treasury bonds. In order to replicate the cash flows of the 8% bond, you could solve a system of equations to determine the weight factors, F1 and F2, which correspond to the proportion of the zero and the 10% bond to be held, respectively.The two equations are as follows:(100 × F1) + (105 × F2) = 104 (replicating the cash flow including principal and interest payments at the end of 1 year), and (5 × F2) = 4 (replicating the cash flow from the coupon payment in 6 months.)Solving the two equations gives us F1 = 0.2 and F2 = 0.8. Thus the price of the 8% bond should be 0.2 (96.12) + 0.8 (106.2) = 104.18. 本题的解题思路是用其他的两个国债来复制1年期的8%的息票的债券，因此，8%的息票的债券的价格是0.2 × 96.12 0.8 × 106.20 = 104.184。

42.The price of a three-year zero coupon government bond is $94.23 and the price of a similar five-year bond is $82.99. Under annual compounding, what is the two-year implied forward rate from year three to year five, F(3,5)?

A.3.67%

B.4.55%

C.5.83%

D.6.56%

参考答案：D

【莽学解析】Note that prices are a function of spot rates: P(3) = F/[1＋s(3)]^3 and P(5) = F/[1＋s(5)]^5no-arbitrage expectation is : [1＋s(3)]^3 × [1 ＋f(3,5)]^2 = [1＋s(5)]^5, such that[1＋f(3,5)]^2 = [1＋s(5)]^5 / [1＋s(3)]^3, and taking square root of both sides:1 f(3,5) = SQRT([1＋s(5)]^5 / [1＋s(3)]^3), such thatf(3,5) = SQRT([1＋s(5)]^5 / [1＋s(3)]^3) - 1, and substituting price in:f(3,5) = SQRT[P(3)/P(5)] - 1.In this case,f(3,5) = SQRT[94.23/82.99] - 1 = 6.56% 请注意，价格是即期汇率的函数：P(3) = F/[1＋s(3)]^3 and P(5) = F/[1＋s(5)]^5 无套利预期是：[1＋s(3)]^3 × [1＋f(3,5)]^2 = [1＋s(5)]^5，则[1＋f(3,5)]^2 = [1＋s(5)]^5 / [1＋s(3)]^3，那么[1＋f(3,5)]^2 = [1＋s(5)]^5 / [1 ＋s(3)]^3 两边开平方1 f(3,5) = SQRT([1＋s(5)]^5 / [1＋s(3)]^3)并将价格替换为f(3,5) = SQRT[P(3)/P(5)] - 1此题中，f(3,5) = SQRT[94.23/82.99] — 1 = 6.56%

43.Key aspects of stress testing governance include coverage, types (and approaches) and capital/liquidity. Each of the following is true about these three general aspects EXCEPT which of the following statements is inaccurate?

A.Types and approaches: Even if it is difficult to estimate their likelihood, REVERSE stress tests that "break the bank" deserve consideration

B.Types and approaches: Scenarios should not be too severe, as severity may stretch credibility with shareholders. If the scenario challenges the institution's viability, then it is probably too severe

C.Capital and liquidity: Stress testing for capital\/liquidity adequacy should be coordinated with annual planning cycles and should be refreshed in the event of a major strategic decision

D.Coverage: Good stress testing coverage includes (i) inclusion of portfolios, exposures, liabilities and business-line activities; (ii) various LEVELS of the organization; (iii) interplay between exposures; and (iv) various time horizons

参考答案：B

【莽学解析】Instead, severity is desirable: "For any scenario analysis conducted, the scenarios used should be relevant to the direction and strategy set by its board of directors, as well as sufficiently severe to be credible to internal and external stakeholders; at least some scenarios should be of sufficient severity to challenge the viability of the institution."相反，严谨性是可取的："对于进行的任何情景分析，所使用的情景应与其董事会设定的方向和策略相关，并且应足够严厉以使内部和外部利益相关者都可以信赖；至少某些情景应 具有足以挑战该机构生存能力的严重程度。"

44.The following Treasury zero rates are exhibited in the market place:6 months = 1.25%1 year = 2.35%1.5 years = 2.58%2 years = 2.95%Assuming continuous compounding, the price of a 2-year Treasury bond that pays a 6 percent semiannual coupon is closest to:

A.105.20

B.103.42

C.108.66

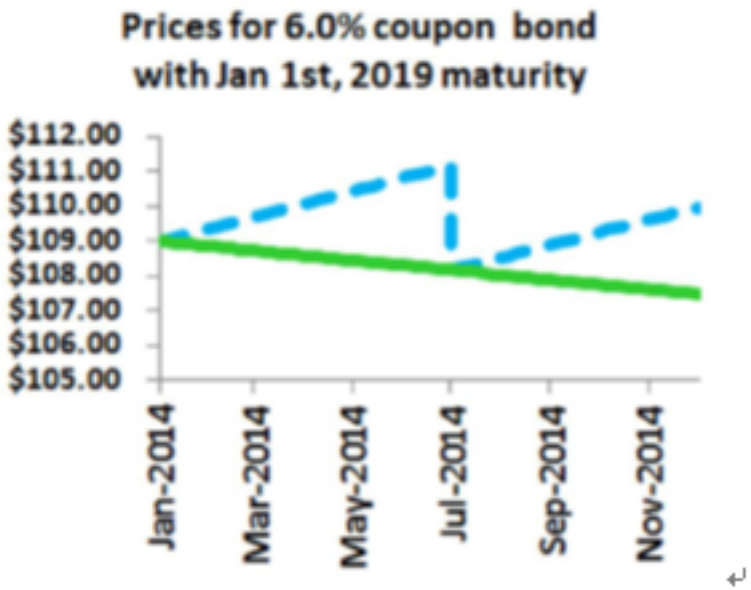
D.105.90

参考答案：D

【莽学解析】Answer: DThe price is given by:

$$3e^{(-0.0125\times0.5)}+3e^{(-0.0235\times1)}+3e^{(-0.0258\times1.5)}+103e^{(-0.0295\times2)}=105.90$$

45. The following chart plots two prices for a 6.0% coupon bond that matures on January 1st, 2019:



Each of the following statements is necessarily true EXCEPT which is not?

A. The dotted blue line is the dirty (aka, full, invoice) price

B. The solid green line is the clean (aka, flat, quoted) price

C. The solid green line represents the money that changes hands in a buy/sell transaction

D. This bond's yield must be less than 6.0% such that the solid green line slopes downward throughout

参考答案：C

【莽学解析】The dotted blue line (which is the invoice price; aka, dirty or full price) represents the money that changes hands in a buy/sell transaction. In regard to (A), (B), and (C), each is true. In regard to (D), this is an actual plot of a bond with a flat 4.0% yield, such that, since its coupon rate is greater than its yield, it's price must exceed par; but as maturity approaches, the bond's price is pulled to par therefore decreases. Do you see how we can infer that yield (YTM) must be less than the coupon rate from the downward (pulling to par) slope of the solid green line? 蓝点虚线（即发票价格；又称脏价或全价）表示在买卖交易中易手的钱。关于（A），（B）和（C），每个都是正确的。 关于（D），这是收益率为4.0%的债券的实际图，因此，由于其息票率大于收益率，其价格必须超过面值； 但是随着到期日的临近，债券的价格被拉低至同等水平。

46. Assume the prices are for settlement on June 1, 2005, today's date. Assume semiannual coupon payments:

Coupon	Maturity	Price
7.500%	12/1/2005	102-9
12.375%	6/1/2006	107-15
6.750%	12/1/2006	104-15
5.000%	6/1/2007	102-9

The discount factor associated with the bonds maturing in December 2005 and June 2006, are closest to:

A. 0.9696/0.9858

B. 0.9858/0.9546

C. 0.9546/0.9696

D. 0.9778/0.9696

参考答案：B

【莽学解析】

$$100\times\left(1+\frac{7.5\%}{2}\right)\times d_1=102+\frac{9}{32},\ d_1=0.9858$$

$$100\times\left(\frac{12.375\%}{2}\right)\times d_1+100\times\left(1+\frac{12.375\%}{2}\right)\times d_2,\ d_2=0.9546$$

47. Your colleague Peter is building a model that will estimate the sensitivity of your firm's bond portfolio to interest rate changes. He is evaluating six different models. Each of his candidate models shocks the rate, but each assumes a different interest rate factor as the model's core assumption. These are the six candidate interest rate factors:I Yield to maturity; aka, yieldII 2-, 5-, 10, and 30-year spot (aka, zero) ratesIII 2-, 5-, 10, and 30-year par yieldsIV Six month forward rates across the entire 30-year curveV Level and slopeVI The continuously compounded, instantaneous rate, r(t)Which of the six are usable (i.e., viable) interest rate factors?

A. Only I. and VI. are usable interest rate factors

B. Only I., II. and III. are usable interest rate factors

C. Only IV, V. and VI. are usable interest rate factors

D. All six are usable interest rate factors

参考答案：D

【莽学解析】It is easy to forget that duration and DV01 are typically yield-based duration and yield-based DV01; i.e., they express price change as a function of yield change. Yield is a popular and common interest rate factor because it is a one-factor formulation of interest rates: the entire term structure is summarized in a single yield. But more sophisticated models are multi-factor. The characterize the term structure, and consequently the interest rate risk factors, in plural terms. In this way, we can refer to the spot rate/forward rate/par yield at 2-, 5-, 10- or, 30-years, for example. Finally, per (VI.) the continuously compounded, instantaneous rate, r(t) is an important interest rate factor. duration和DV01：价格变化表示为收益率变化的函数。收益率是一个流行的、常见的利率风险因子，因为它是一个单因素公式:整个期限结构概括为一个单一的收益率。但多因素更加复杂的。这样，我们可以参考2年期、5年期、10年期或30年期的即期汇率/远期汇率/票面收益率。连续复利、瞬时利率，r(t)是一个重要的利率风险因子。

48. Assume the reference term structure, which happens to be the theoretical Treasury spot rate curve, is flat at a semiannually compounded rate of 1.30% per annum. A $100 par bond with a 20-year maturity pays a 4 3/8 coupon (4.375% coupon rate) and has a current price of $95.82. Which is nearest to the bond's spread with semi-annual compounding; a.k.a., bond-equivalent basis?

A. 1.74%

B. 3.40%
C. 4.00%
D. 4.70%
参考答案：B
【莽学解析】N = 40, PV = -95.82, PMT = 2.18750, FV = 100; CPT I/Y = 2.349832 × 2 = 4.699664%. Such that the spread = 4.699664%-1.30% = 3.3997%N = 40, PV =-95.82, PMT = 2.18750, FV = 100 ； CPT I/Y = 2.349832 × 2 = 4.699664%. 那么两个利率的差异为=4.699664%-1.30% = 3.3997%

49. The eighteen-month forward curve is upward sloping with the following sequence of six-month forward rates: F(0,0.5) = S(0.5) = 1.0%, F(0.5, 1.0) = 3.0%, F(1.0,1.5) = 5.0%. What is the price of a $100 face value bond that matures in 1.5 years with a semi-annual coupon that pays a coupon rate of 6.0%?
A. $99.02
B. $100.56
C. $103.89
D. $104.43
参考答案：D
【莽学解析】PV (1st coupon) = $3.0/(1＋1%/2) = $2.99PV (2nd coupon) = $3.0/[(1＋1%/2)×(1 3%/2)] = $2.94PV (final cash flow) = $103/[(1＋1%/2)×(1＋3%/2)×(1＋5%/2] = $98.51. Sum of cash flows = $104.43 (exactly) or 104.44 第一笔票息的现金流折现值：PV (1st coupon) = $3.0/(1＋1%/2) = $2.99 第二笔票息的现金流折现值：PV (2nd coupon) = $3.0/[(1＋1%/2)×(1＋3%/2)] = $2.94 最后一笔现金流折现值：PV (final cash flow) = $103/[(1＋1%/2)×(1＋3%/2)×(1＋5%/2] = $98.51. 总现金流：Sum of cash flows = $104.43 (exactly) or 104.44

50. A 1-year 7.25% coupon bond is trading at a price of 98, a 2-year 6.1% coupon bond is trading at 99, and a 3-year 7.55% coupon bond is trading at 101. All coupons and rates are given using the annual Actual/Actual convention. Using this information the 1-year forward rate 2 years from now is closest to:
A. 6.57%
B. 7.14%
C. 8.24%
D. 8.29%
参考答案：D
【莽学解析】The solution is as follows:

51. Analyst Patricia is analyzing the following four bonds:
Bond A is a $100.00 face value bond with 7.0 years to maturity that pays a monthly coupon at a rate of 6.0% per annum and offers a yield of 5.0% per annum (with monthly compound frequency)
Bond B is a $100.00 face value bond with 10.0 years to maturity that pays a semi-annual coupon at a rate of 4.0% per annum and offers a yield of 5.0% per annum (with semiannual compound frequency)
Bond C is a $100.00 face value bond with 10.0 years to maturity that pays an annual coupon at a rate of 7.0% per annum and offers a yield of 6.0% per annum (with annual compound frequency)
Bond D is a $1,000.00 face value zero-coupon bond with 30.0 years to maturity that offers a

Step1. The1-year spot rate

$$S_1 = (100 + 7.25)/98 - 1 = 9.439\%$$

Step2. The 2-year spot rate

$$6.1/(1 + 9.439\%) + 106.1/(1 + S_2)^2 = 99, S_2 = 6.567\%$$

Step3. The 3-year spot rate

$$7.55/(1 + 9.439\%) + 7.55/(1 + S_2)^2 + 107.55/(1 + S_3)^3 = 101$$

$$= 7.14\%$$

$$F_{2,3} = (1.0714^3/1.06567^2) - 1 = 8.29\%$$

yield (aka, yield to maturity) of 8.0% per annum with semi-annual compound frequency

In terms of their current theoretical prices, which bonds are, respectively, the cheapest and most expensive (among the four)?

A. Bond A is the cheapest and Bond D is the most expensive

B. Bond B is the cheapest and Bond C is the most expensive

C. Bond C is the cheapest and Bond A is the most expensive

D. Bond D is the cheapest and Bond B is the most expensive

参考答案：B

【莽学解析】

Bond B is the cheapest (at $92.21) and Bond C is the most expensive (at $107.36). The following are the theoretical prices:Bond A: 7×12 = 84 N, 5/12 = 0.4167 I/Y, 0.06×100/12 = 0.50 PMT, 100 FV and CPT PV [+/-] = $105.90Bond B: 10×2 = 20 N, 5/2 = 2.5 I/Y, 0.04×100/2 = 2.0 PMT, 100 FV and CPT PV [+/-] = $92.21Bond C: 10×1 = 10 N, 6/1 = 6.0 I/Y, 0.07×100/1 = 7.0 PMT, 100 FV and CPT PV [+/-] = $107.36Bond D: 30×2 = 60 N, 8/2 = 4.0 I/Y, 0 PMT, 100 FV and CPT PV [+/-] = $95.06债券B是最便宜的为$92.12，债券C是最贵的价格为$107.36.计算理论价格过程如下： Bond A: 7×12 = 84 N, 5/12 = 0.4167 I/Y, 0.06×100/12 = 0.50 PMT, 100 FV and CPT PV [+/-] = $105.90 Bond B: 10×2 = 20 N, 5/2 = 2.5 I/Y, 0.04×100/2 = 2.0 PMT, 100 FV and CPT PV [+/-] = $92.21 Bond C: 10×1 = 10 N, 6/1 = 6.0 I/Y, 0.07×100/1 = 7.0 PMT, 100 FV and CPT PV [+/-] = $107.36 Bond D: 30×2 = 60 N, 8/2 = 4.0 I/Y, 0 PMT, 100 FV and CPT PV [+/-] = $95.06

52. Given the following bonds and forward rates:

Maturity	YTM	Coupon	Price
1 year	4.5%	0%	95.694
2 years	7%	0%	87.344
3 years	9%	0%	77.218

1-year forward rate one year from today = 9.56%
1-year forward rate two years from today = 10.77%
2-year forward rate one year from today = 11.32%

Which of the following statements about the forward rates, based on the bond prices, is true?
A. The 1-year forward rate one year from today is too low.
B. The 2-year forward rate one year from today is too high.
C. The 1-year forward rate two years from today is too low.
D. The forward rates and bond prices provide no opportunities for arbitrage.
参考答案：C
【莽学解析】The solution is as follows:

$$\text{1-year forward rate one year from today} = \frac{1.07^2}{1.045} - 1 = 9.56\%$$

$$\text{1-year forward rate two years from today} = \frac{1.09^3}{1.07^2} - 1 = 13.11\%$$

$$\text{2-year forward rate one year from today} = \sqrt{1.09^3/1.045}$$

$$11.32\%$$

53. Which of the following statements most likely describes an advantage of using stressed risk metrics?
A. The risk metric will respond to current market conditions.
B. The risk metric will be more realistic.
C. The risk metric will be more conservative.
D. The risk metric will mirror the portfolio returns.
参考答案：C
【莽学解析】A key advantage of using stressed risk metrics is chat they are conservative. In examining capital adequacy for unexpected losses and considering stressed metrics, the amount of capital is likely to be more than sufficient. In other words, a risk metric that is stressed is likely to be more conservative. A more conservative risk metric does not necessarily mean it is more realistic. One of the disadvantages of using stressed inputs is that the risk metric becomes unresponsive to current market conditions and is more dependent on the investments within the portfolio.压力测试是保守的，因为在使用压力测试进行风险评估，用到的数据是偏多的。并且压力测试对于当前的市场条件是不敏感的，而是更依赖与投资组合中的投资。

54. An eight-year bond with a current price of $975.00 pays an annual coupon of 6.0%. What is the bond's yield-to-maturity (YTM)?
A. 5.88%
B. 6.41%
C. 6.89%
D. 7.14%

参考答案：B

【莽学解析】N = 8, PV = -975, PMT = 60, FV = 1000, CPT I/Y = 6.40913%通过计算器得出N = 8, PV =-975, PMT = 60, FV = 1000, CPT I/Y = 6.40913%

55.About stress testing methodologies, BIS writes, "Stress tests cover a range of methodologies. Complexity can vary, ranging from simple sensitivity tests to complex stress tests, which aim to assess the impact of a severe macroeconomic stress event on measures like earnings and economic capital. Stress tests may be performed at varying degrees of aggregation, from the level of an individual instrument up to the institutional level. Stress tests are performed for different risk types including market, credit, operational and liquidity risk.Notwithstanding this wide range of methodologies, the crisis has highlighted several methodological weaknesses." According to BIS, which were the primary WEAKNESSES of stress testing methodologies during the crisis?

A.Most models relied on historical statistical relationship and insufficiently aggregated risks across the firm, often due to infrastructure limitations

B.Too many scenarios were overly complex such that participants often did not understand the output; and the output was not communicated in an easy-to-understand manner

C.Due to lack of general quantitative aptitude at the executive level, too often the subjective or qualitative judgment of so-called experts was utilized instead of objective data

D.Scenarios tended to emphasize extremely severe market events, sometimes exaggerated beyond all realism, and therefore ironically ignored more plausible but mundane scenarios

参考答案：A

【莽学解析】Most models relied on historical statistical relationship and insufficiently aggregated risks across the firm, often due to infrastructure limitations大多数模型都依赖于历史统计关系，并且由于基础设施的限制，整个公司的风险汇总不足

56.A U.S. Treasury note with 1.5 years to maturity has a market price of $101.75 and pays a semi-annual coupon with a coupon rate of 5.50%. The market's discount function is the following set of discount factors: d(0.5) = 0.970, d(1.0) = 0.950, and d(1.5) = 0.920. Is the bond trading cheap, rich, or fair?

A.Trading cheap

B.Trading fair

C.Trading rich

D.Cheap at six months, fair at one year, and rich at 1.5 years.

参考答案：C

【莽学解析】The model ("predicted") price is the discounted present value = $2.75 × d(0.5) + $2.75 × d(2) + $102.75 × d(3) = 99.81. As the market price ($101.75) is greater than than the predicted price ($99.81), the bond is trading rich.If market price > model (predicted) price, bond is "trading rich".If market price < model (predicted) price, bond is "trading cheap". In regard to (D), this is meaningless.模型（“预测的”）价格是折现现值=2.75×d（0.5） 2.75×d（2） 102.75×d（3）= 99.81。 由于市场价格（101.75美元）高于预期价格（99.81美元），该债券交易富裕。如果市场价格大于模型（预测）价格，则债券“交易丰富”。如果市场价格小于模型（预测）价格，则债券“交易便宜”。选项D，是没有意义的。

57.Which of the following statements related to conducting stress tests incorrect?

A.Basel\u2161requires banks to undertake stress tests for assessing capital adequacy at least

once a month
B. Results of stress testing should be used for strategic business planning purposes
C. Stress testing can use sensitivity analysis to assess risk
D. Stress testing should be used to identify risk concentrations
参考答案：A
【莽学解析】Basel II does not impose monthly requirements for stress testing.巴塞尔协议二对压力测试的月度评估并没有要求，这个仅做了解即可，相关知识在二级中会有更加深入的讲解。

58. Which of the following statements regarding the trustee named in a corporate bond indenture is correct?
A. The trustee has the authority to declare a default if the issuer misses a payment.
B. The trustee may take action beyond the indenture to protect bondholders.
C. The trustee must act at the request of a sufficient number of bondholders.
D. The trustee is paid by the bondholders or their representatives.
参考答案：A
【莽学解析】According to the Trust Indenture Act. If a corporate issuer fails to pay interest or principal, the trustee may declare a default and take such action as may be necessary to protect the rights of bondholders. Trustees can only perform the actions indicated in the indenture, but are typically under no obligation to exercise the powers granted by the indenture even at the request of bondholders. The trustee is paid by the debt issuer, not by bondholders or their representatives.根据《信托契约法》。 如果公司发行人未支付利息或本金，则受托人可以宣布违约，并采取必要的行动来保护债券持有人的权利。 受托人只能执行契约中规定的行动，但是通常没有义务行使契约所赋予的权力，即使在债券持有人的要求下也是如此。 受托人由债务发行人支付，而不是由债券持有人或其代表支付。

59. Suppose that the yield curve is upward sloping. Which of the following statements is TRUE?
A. The forward rate yield curve is above the zero-coupon yield curve, which is above the coupon-bearing bond yield curve.
B. The forward rate yield curve is above the coupon-bearing bond yield curve, which is above the zero-coupon yield curve.
C. The coupon-bearing bond yield curve is above the zero-coupon yield curve, which is above the forward rate yield curve.
D. The coupon-bearing bond yield curve is above the forward rate yield curve, which is above the zero-coupon yield curve.
参考答案：A
【莽学解析】With an upward sloping curve, the coupon curve is the lowest, the zero-coupon curve is above the coupon curve and the forward curve is above the zero-coupon curve. The order is reversed if the curve is downward sloping.当曲线向上倾斜时，息票曲线是最低的，零息票曲线在息票曲线之上，而正向曲线在零息票曲线之上。如果曲线向下倾斜，则顺序颠倒。

60. For consol, the Macaulay duration is
A. 1+1\/y
B. 1\/y
C. 1\/(1+y)
D. 1\/(1+y)+1
参考答案：A

【莽学解析】MAC.D=M.D*(1+y)对于consol，麦考利久期是1 1/y。

61.The interest rate for a 1-year period is 5% and the rate for a 2-year period is 6%. Assuming continuous compounding, what is the forward rate for the period from the end of the first year to the second year?

A.6.9991%

B.7.0000%

C.7.0009%

D.8.0000%

参考答案：B

【莽学解析】e^(5%)×e^(F_1,2)=e^(6%×2). Taking the log of both sides, 5%+F_1,2=6%×2, F_1,2=7%.这道题的如下：e^(5%)×e^(F_1,2)=e^(6%×2)。5% F_1,2=6%×2，F_1,2=7%.

62.A firm has just issued $1,000 face value bonds with a coupon rate of 8%, paid semiannually, and a maturity of 15 years. If the issue price for this bond is $785.50, what is the yield-to-maturity, stated annually?

A.9.872%

B.10.365%

C.10.942%

D.11.120%

参考答案：C

【莽学解析】Answer: CUsing a bond calculator, PV = -785.5; FV = I000; N = 30(15 × 2); PMT = 40(1000 × 0.08/2). Solving for I/Y we get 5.471 × 2 = 10.942.使用债券计算器，PV = -785.5; FV = I000; N = 30(15 × 2); PMT = 40(1000 × 0.08/2)。求I/Y，得到5.471%× 2 = 10.942%.。

63.An investor buys a US Treasury 4s of May 31, 2023 at a price of $922.05 for settlement on June 1st, 2013. The yield on this 10-year bond is 5.00% as, per the TI BA II+ calculator, N = 20, I/Y = 2.50, FV = 1000, PMT = 20 returns a present value of about $922.05. Over the subsequent one-year period, the bond pays a $20.00 coupon on November 30th and another $20.00 coupon on May 31st. The November coupon is reinvested at a semiannually compounded rate of 2.00%. If the bond's yield remains perfectly flat at 5.00%, which is nearest to the bond's gross realized return over the one year period?

A.4.88%

B.4.97%

C.5.00%

D.5.03%

参考答案：D

【莽学解析】If the yield remains flat at 5.00%, the implied bond price one year forward = $928.23; i.e., N = 18 periods, I/Y = 2.50, PMT = 20, FV = 1000 --> CPT PV = 928.23.Gross return =[928.23+ 20.00×(1+2.0%/2) + 20.00-922.05] /922.05= 5.0301% or, with exactly bond pricing, 5.030%. 如果收益率保持在5.00%不变，则提前一年的隐含债券价格= $928.23; i.e., N = 18 periods, I/Y = 2.50, PMT = 20, FV = 1000 ..> CPT PV = 928.23.

64.Which of the following statements about governance structure is/are not accurate? Ⅰ.Senior management has ultimate oversight responsibility and accountability for an entire institution. Ⅱ. Senior management should use scenario analysis, not stress testing, to evaluate an

institutions risk decisions. Ⅲ.The board of directors has responsibility for implementing authorized stress testing activities. Ⅳ.The board of directors can change an institution's capital levels and exposures following a review of stress test results.

A.II only.

B.I, II, III.

C.IV only.

D.All not.

参考答案：B

【莽学解析】Stress testing can serve as an early warning sign of upcoming pressures and risks. The board of directors can take actions that include adjusting capital levels, increasing liquidity, adjusting risks, or engaging in or withdrawing from certain activities.The board of directors has ultimate oversight responsibility and accountability for an entire institution. Senior management is responsible for implementing authorized stress testing activities. Senior management should use stress testing, complemented with scenario analysis, to evaluate an institutions risk decisions.压力测试可以作为即将到来的压力和风险的早期预警信号。董事会可以采取行动，包括调整资本水平，增加流动性，调整风险，或参与或退出某些活动。董事会对整个机构负有最终的监督责任和责任。高级管理层负责实施经过授权的压力测试活动。高级管理层应该使用压力测试，辅以情景分析，来评估机构的风险决策。

65.A two-year zero-coupon bond issued by corporate XYZ is currently rated One year from now XYZ is expected to remain at A with 85% probability, upgraded to AA with 5% probability, and downgraded to BBB with 10% probability. The risk free rate is flat at 4%. The credit spreads are flat at 40, 80, and 150 basis points for AA, A, and BBB rated issuers, respectively. All rates are compounded annually. Estimate the expected value of the zero-coupon bond one year from now (for USD 100 face amount). Fixed Income Securities:

A.USD 92.59

B.USD 95.35

C.USD 95.37

D.USD 95.42

参考答案：C

【莽学解析】Answer: CThe expected value of the zero coupon bond one year from now is given by

$$5\%\times\frac{100}{1+(4\%+0.004)}+85\%\times\frac{100}{1+(4\%+0.008)}+10\%\times\frac{100}{1+(4\%+0.015)}=95.37$$

66.A three-year bond with a current price of $105.90 pays a semi-annual coupon with a coupon rate of 5.0% per annum. What is the bond's yield-to-maturity (YTM) on a bond-equivalent basis?

A.1.97%

B.2.25%

C.2.93%

D.3.56%

参考答案：C

【莽学解析】PV = -105.91, PMT = 2.5, FV=100, CPT I/Y = 1.46392×2=2.92784%; i.e., bond-equivalent refers to semi-annual compound frequency.这道题的计算如下：PV =-105.91, PMT = 2.5, FV=100, CPT I/Y = 1.46392×2=2.92784%利率需要将计算出来的值乘2.

67.For a June 1st settlement, an investor finances the entire purchase of a bond with a price of $115.00 at a semiannually compounded borrowing rate of 0.60%. Six months later, on November 30th, the 3 1/8 bond pays a $1.56250 coupon (i.e., $3.125/2 = $1.56250) and its price has "pulled to par" by dropping to $114.00. Which is nearest to the six-month net realized return?
A.-0.87%
B.-0.57%
C.+0.19%
D.+0.49%
参考答案：C
【莽学解析】[114+1.56250-115×(1.003)]/115=0.1891%, which is equal to the gross return minus the financing cost:(114 + 1.5625-115)/115 = 0.4891% gross realized return-0.60%/2 borrowing rate=0.1891% 这道题的如下：

68.When developing a stress testing program, according to BIS, each of the following elements or component is essential EXCEPT which is not?
A.Reverse stress test
B.System-side interactions and feedback effects
C.Rigorously estimated ex ante probabilities of stress events based on statistical relationships
D.Imaginative and forward-looking scenarios informed by the judgment of experts across the organization
参考答案：C
【莽学解析】BIS: "The financial crisis has shown that estimating ex ante the probabilities of stress events is problematic. The statistical relationships used to derive the probability tend to break down in stressed conditions. In this respect, the crisis has underscored the importance of giving appropriate weight to expert judgment in defining relevant scenarios with a forward looking perspective."国际清算银行：“金融危机表明，事前估计压力事件的概率是有问题的。用来推论概率的统计关系在压力条件下往往会破裂。在这方面，危机强调了给予适当权重的重要性 以前瞻性的眼光来定义相关方案时的专家判断。”

69.Under semi-annual compounding, what is the DV01 of a $100 face value 10-year zero-coupon bond with a yield of 8.0%?
A.$0.044
B.$0.099
C.$0.152
D.$0.227
参考答案：A
【莽学解析】Macaulay duration = 10 years, such that modified duration = 10/(1 8%/2) = 9.615385.Price of bond = $45.6387; DV01 = modified duration × Price /10,000 = 9.615385 × $45.6387 / 10000 = $0.043883Alternatively, we can re-price the bond @ yield = 7.99%, such that DV01 = $45.6826 - $45.6387 = $0.043906. Macaulay duration = 10 years modified duration =10/(1 (8%)/2)=9.615385. Price of bond = $45.6387; DV01 = modified duration × Price /10,000 = 9.615385 ×$45.6387 / 10000 = $0.043883 或者，我们可以对债券重新定价@ yield= 7.99%, such that D01= $45.6826 - $45.6387 = $0.043906.

70.For an option-free bond, which of the following are the effects of the convexity adjustment on the magnitude (absolute value) of the approximate bond price change in response to an increase in yield and in response to a decrease in yield, respectively? Decrease in Yield; Increase in Yield

A.Increase in magnitude; Decrease in magnitude

B.Increase in magnitude; Increase in magnitude

C.Decrease in magnitude; Decrease in magnitude

D.Decrease in magnitude; Increase in magnitude

参考答案：A

【莽学解析】Option-free bonds have positive convexity and the effect of (positive) convexity is to increase the magnitude of the price increase when yield fall and to decrease the magnitude of the price decrease when yields rise.不含权债券具有正凸性，(正)凸性的作用是增加收益率下降时价格的上升幅度，减少收益率上升时价格的下降幅度。

71.A 30-year bond pays a semi-annual coupon with a coupon rate of 2.0%. The bond's yield (YTM) is 7.0% and its current price is $37.64. What is the bond's dollar value of an '01 (DV01; aka, DVBP or PV01)?

A.$0.01

B.$0.03

C.$0.06

D.$0.12

参考答案：C

【莽学解析】If we re-price the bond under a one bps drop,N = 60, I/Y = 6.99/2 = 3.495, PMT = 1, FV = 100, and CPT PV = $37.7002Then the DV01 is the (absolute value) in change in price associated with the one bps drop: 37.70 - 37.64 = $0.062如果我们将债券价格下调1个基点，N = 60, I/Y = 6.99/2 = 3.495, PMT = 1, FV = 100，CPT PV = $37.7002然后DV01是与1 bps下降相关的价格变化的（绝对值）：37.70 - 37.64 = $0.062

72.According to current Basel committee proposals, banks using the advanced measurement approach must calculate the operational risk capital charge at a:

A.99 percentile confidence level and a 1-year time horizon.

B.99 percentile confidence level and a 5-year time horizon.

C.99.9 percentile confidence level and a 1-year time horizon.

D.99.9 percentile confidence level and a 5-year time horizon.

参考答案：C

【莽学解析】According to current Basel committee proposals,99.9 percentile confidence level and a 1-year time horizon for opt risk.巴塞尔委员会的规定，银行利用高级计量法计算操作风险资本金要求必须满足1年99.9%的置信水平。

73.A portfolio has the following composition: I Bond portfolio A: price $90,000, modified duration 2.5, long position in 8 bonds II Bond portfolio B: price $110,000, modified duration 3, short position in 6 bonds III Bond portfolio C: price $120,000, modified duration 3.3, long position in 12 bonds Interest rates are 10%.If the rates rise by 25 basis points, then the bond portfolio value will:

A.decrease by $11,430

B.decrease by $21,330

C. decrease by $12,573
D. decrease by $23,463
参考答案：A
【莽学解析】Answer: A

	V	ω	ωD*
A	720000	48%	1.2
B	-660000	-44%	-1.32
C	1440000	96%	3.17
Total	1500000		3.048

△P = -3.048 × 1500000 × 0.0025 =-11430 久期的相关计算参照。△P = -3.048 × 1500000 × 0.0025 = -11430

74. A $100 bond with 7.0 years to maturity has a 4.0% per annum coupon rate that is paid semi-annually. What is the effective convexity of the bond when the yield is 4.0% such that the bond's price is $100 (if coupon rate equals yield, bond prices at par)?
A. 42.60
B. 98.77
C. 214.30
D. 856.80
参考答案：A
【莽学解析】If we use a shock of 10 bps (per example, we can also use 1 bps, but the answer only differs by 0.000222, and is still 42.60):P[@ 3.9%] is given by: 14 = N, 1.95 = I/Y, 2 = PMT, 100 = FV; CPT PV, /- = 100.607448 (STO 1 for retrieval)P[@ 4.1%] is given by: 14 = N, 2.05 = I/Y, 2 = PMT, 100 = FV; CPT PV, /- = 99.396812 (STO 2 for retrieval)Please note that after your price the bond at 3.9%, you only need to re-enter "2.05 = I/Y" and re-compute as the other inputs are unchanged!Dollar convexity = (99.396812＋100.607448 - 2 × 100) / 0.001^2 = 4,260.And convexity (C) = (P[yield @ 4.1%] ＋P[yield @ 3.9%] - 2×$100)/(10 bps)^2 × 1/P = dollar convexity×1/P = 4,260/$100 = 42.60如果我们使用10 bps的变动（例如，我们也可以使用1 bps，但答案仅相差0.000222，但仍为42.60）：P[@ 3.9%] 价格为: 14 = N, 1.95 = I/Y, 2 = PMT, 100 = FV; CPT PV, /- = 100.607448 (STO 1 for retrieval)P[@ 4.1%]价格为: 14 = N, 2.05 = I/Y, 2 = PMT, 100 = FV; CPT PV, /- = 99.396812请注意，在将债券价格定为3.9%之后，您只需重新输入“ 2.05 = I / Y”并重新计算，因为其他输入不变！Dollar convexity = (99.396812 100.607448 - 2 × 100) / 0.001^2 = 4,260.convexity (C) = (P[yield @ 4.1%] P[yield @ 3.9%] - 2×$100)/(10 bps)^2 × 1/P = dollar convexity×1/P = 4,260/$100 = 42.60

75. Which of the following statements concerning the measurement of operational risk is correct?
A. Economic capital should be sufficient to cover both expected and worst-case operational risk losses.
B. Loss severity and loss frequency tend to be modeled with lognormal distributions.
C. Operational loss data available from data vendors tend to be biased towards small losses.
D. The standardized approach used by banks in calculating operational risk capital allows for different beta factors to be assigned to different business lines.
参考答案：D

【莽学解析】In the standardized approach to calculating operational risk, a bank's activities are divided up into several different business lines, and a beta factor is calculated for each line of business. Economic capital covers the difference between the worst-case loss and the expected loss. Loss severity tends to be modeled with a lognormal distribution, but loss frequency is typically modeled using a Poisson distribution. Operational loss data available from data vendors tends to be biased towards large losses.在计算操作风险的标准化方法中，将银行的活动划分为几个不同的业务线，并为每个业务线计算一个beta因子。 经济资本涵盖了最坏情况的损失与预期损失之间的差额。 损失严重程度倾向于使用对数正态分布进行建模，但是损失频率通常使用泊松分布进行建模。 从数据供应商处获得的运营损失数据倾向于偏向大损失。

76.A market maker sells (writes) $50 million face value of call options on underlying bonds when the interest rate is 4.0%. At this 4.0% rate level, the DV01 (dollar value of an '01) of the option, per 100 face value, is $0.030. At this 4.0% rate level, the DV01 (per 100 face value) of the underlying bond is $0.070. What is the market maker's hedge transaction?

A.Short $50.0 million face amount of underling bonds

B.Short $50 million face amount of call options on bond

C.Long $21.4 million face amount of underlying bonds

D.Long $50.0 million face amount of underlying bonds

参考答案：C

【莽学解析】F = $50 million × 0.030/0.070 = $21.429 million face amount of underlying bond.F(B)=-F(A)×DV01(A)/DV01(B); in this case, F(B) = -(-50) × 0.030/0.070 = + 21.429 indicates LONG (+) bonds.As the market maker will lose on the call options, if rates decrease, the market maker should purchase (go long) the underlying bonds, which will gain as rates decrease to offset.If the market maker goes long $21.429 the underlyling bonds, they key is that the market maker is neutral with respect to dollar duration:On the written options: 0.030/100 × 50 million = 0.0150 = a loss of $15,000 per each basis point decline; hedged by:On the long bonds: 0.070/100 × 21.429 million = 0.0150 = a gain of $15,000 per each basis point decline.F = $50 million × 0.030/0.070 = $21.429万美元基础债券面额。F（B）＝-F（A）×DV01（A）/ DV01（B）； 在这种情况下，F（B）=-（-50）×0.030 / 0.070 = 21.429表示买入债券。由于做市商在看涨期权头寸上遭受损失，因此如果利率降低，则做市商应购买（长期）基础债券，随着利率的降低抵消其收益。如果做市商做空基础债券$ 21.429，他们的关键是做市商在美元期限上保持中立：承兑期权：0.030 / 100×5000万= 0.0150 =每个基点下降损失15,000美元；对冲：对于多头债券：0.070 / 100×214.2百万= 0.0150 =每个基点下跌获得$ 15,000的收益。

77.When the maturity of a plain coupon bond increases, its duration increases:

A.indefinitely and regularly

B.up to a certain level

C.indefinitely and progressively

D.in a way dependent on the bond being priced above or below par

参考答案：B

【莽学解析】Answer: BA coupon bond's duration increases as its maturity increases, but it can never be larger than the number of years to maturity.票息债券的久期随着其到期日的增加而增加，但永远不能超过其到期期限。

78.The rate of change of duration with respect to the underlying yield of a fixed income bond is called:

A. Convexity
B. Delta
C. Theta
D. DVBP
参考答案：A
【莽学解析】Answer: AConvexity measures how interest rate sensitivity changes with interest rates.凸度度量利率敏感性如何随利率变化。

79. The following table provides the initial price of a C-STRIP and its present value after application of a one basis point shift in four key rates.

	Value
Initial value	25.11584
2-year shift	25.11681
5-year shift	25.11984
10-year shift	25.13984
30-year shift	25.01254

What is the key rate ’01 and key rate duration for a 30-year shift?
A. 0.02438.60
B. 0.02441.13
C. 0.10315.80
D. 0.10341.13
参考答案：D
【莽学解析】这道题的答案是：

$$\text{key rate } 01 = -\frac{1}{10000} \times \frac{25.01254 - 25.11584}{0.01\%} = 0.103$$

$$\text{key rate duration} = 0.103 \times \frac{10000}{25.11584} = 41.13$$

key rate 01=－1/10000×(25.01254－25.11584)/(0.01%)=0.103 key rate duration=0.103×10000/25.11584=41.13

80. Assume the coupon curve of prices for Ginnie Maes in June 2001 is as follows: 6 percent at 92; 7 percent at 94, and 8 percent at 96.5. What is the effective duration of this MBS?
A. 2.45
B. 2.40
C. 2.33
D. 2.25
参考答案：B

【莽学解析】这道题的计算过程如下：

$$D_E = \frac{(V_- - V_+)}{2V_0\Delta y} = \frac{(96.5 - 92)}{2 \times 94 \times 0.01} = 2.4$$

81. A 15-year zero-coupon bond has a price of $63.98 when the yield is 3.00%. At this 3.00% yield, the bond's dollar duration is -952.0; if the yield increases by 10 basis points to 3.10% the bond's dollar duration drops to -938.0. Recall that the dollar duration is the first derivative of the price-rate function, dP/dy (modified duration is -1/P multiplied by this dollar duration). Which is nearest to the bond's convexity at 3.00%?

A. 28

B. 124

C. 219

D. 435

参考答案：C

【莽学解析】

C = [(952 − 938)/0.0010]/63.98 = 218.82; please note how near it is to 15 years ^ 2 225.

we can estimate the second derivative (dollar convexity) by dividing the change in the fi derivative by the change in the rate.

In this case, the dollar convexity is given by (952 − 938)/0.001 = 14,000.

$$\text{Convexity (C)} = \frac{d^2P}{dy^2} \times \frac{1}{P} = \text{dollar convexity} \times \frac{1}{P} = \frac{14{,}000}{63.98} = 218.82$$

82. Calculate the Modified Duration of a bond with Macaulay duration of 13.083 years. Assume market interest rates are 11.5% and the coupon on the bond is paid semiannually.

A. 13.083

B. 12.732

C. 12.459

D. 12.371

参考答案：D

【莽学解析】Answer: DD* = D/(1 y/m) = 13.083/(1 11.5%/2) = 12.371D* = D/(1 y/m) = 13.083/(1 11.5%/2) = 12.371

83. In regard to interest rate factors, which of the following statements is necessarily TRUE?

A. If we estimate the change in bond price using both duration and convexity, we are using a two-factor model

B. Any single-factor interest rate model, by definition, assumes a parallel shift in the term

structure of spot rates

C.The spot (zero) rates, par rate and yield (YTM) can be the single interest rate factor, but a forward rate cannot be the single factor as it represents a curve of several rates

D.The yield-based DV01 is a special case of the DV01 in which the single interest rate factor is yield-to-maturity (YTM)

参考答案：D

【莽学解析】In regard to (A), (B), and (C), each is FALSE.In regard to (B), this is tempting. Although the assumption of parallel shift implies a single-factor, the converse is not necessarily true: various maturities only need to shift as a function of a single factor, but for a non-parallel outcome. For example, all spot rates can shift as some function of the 10-year rate. In regard to correct answer (D), Yield-based DV01 assumes that the yield-to-maturity changes by one basis point while the general definition of DV01. To avoid conusion, some market participants have different names for DV01 measures according to the assumed measure of changes in rates. For example, the change in price after a parallel shift in forward rates might be called DVDF or DPDF while the change in price after a parallel shift in spot or zero rates might be called DVDZ or DPDZ."关于（A），（B）和（C），均为FALSE。关于（B），这很诱人。 尽管并行转移的假设暗示了一个单一因素，但反过来并不一定成立：各种成熟度只需要根据单个因素进行转移，而不是平行的结果。 例如，所有即期利率都可能随十年期利率的变化而变化。关于正确答案（D），基于收益率的DV01假定到期收益率变化一个基点，而DV01的一般定义是。 为避免混淆，某些市场参与者根据假定的费率变化量度对DV01量度使用了不同的名称。 例如，在远期汇率平行变动后的价格变化可以称为DVDF或DPDF，而在即期汇率或零利率平行变动后的价格变化可以称为DVDZ或DPDZ。”

84.A $100 face value bond with 20 years to maturity pays a semi-annual coupon with a 4.0% coupon rate. If we compute effective duration and effective convexity, at a yield of 6.0%, with a shock of ten basis points (i.e., we re-price the bond at 5.90% and 6.10%), what is the estimate given by duration and convexity in PERCENTAGE terms if the yield DROPS by 100 basis points (1.0%)?

A.+ 6.488%

B.+ 9.717%

C.+ 12.025%

D.+ 13.670%

参考答案：D

【莽学解析】At 5.9%, bond price = $77.8624At 6.0%, bond price = $76.8852At 6.1%, bond price = $75.9245(tip: don't re-key all the TVM inputs, only re-key the I/Y and re-compute the price)Effective duration = -1/P×(P[10 bps] - P[-10 bps])/(2×10 bps) = 12.6027.Effective convexity = 1/P×(P[10 bps] ＋P[-10 bps]-2×P[0])/(10 bps)^2 = 213.37.Estimated change in bond price (given -1.0% yield change) = -D×(-1.0%) 0.5×C×(-1.0%)^2 = 12.6027%＋1.067% = 13.6695%.This estimates a bond price of $87.3951 @ 5.0% yield, compared to an actual price of $87.4486.回报率 5.9%, bond price = $77.8624回报率6.0%, bond price = $76.8852回报率6.1%, bond price = $75.9245Effective duration = -1/P×(P[10 bps] - P[-10 bps])/(2×10 bps) = 12.6027.Effective convexity = 1/P×(P[10 bps] ＋P[-10 bps]-2×P[0])/(10 bps)^2 = 213.37.债券价格的估计变化（给出-1.0%的收益率变化）= -D×(-1.0%) 0.5×C×(-1.0%)^2 = 12.6027%＋1.067% = 13.6695%.估计债券价格为87.3951美元，收益率为5.0%，而实际价格为87.4486美元。

85.A bank has $500 million in assets with a modified duration of 7 and $400 million in liabilities with a modified duration of 5. Accounting only for duration effects, the impact of

a 50-basis-point parallel upward shift in the yield curve on the bank's equity value is closest to a:

A. $7.5 million decrease

B. $7.5 million increase

C. $15 million decrease

D. $15 million increase

参考答案：A

【莽学解析】Answer: AThe change in asset value would be a decrease of [($500,000,000)*(7)*(0.005)] = $17,500,000, whereas the change in liability value would be a decrease of [($400,000,000)*(5)*(0.005)] = $10,000,000. The net effect would be a decline in equity value of $7.5 million.资产价值变化将减少[（$ 500,000,000）*（7）*（0.005）] = $ 17,500,000，而负债价值变化将减少[[（$ 400,000,000）*（5）*（0.005）] = $ 10,000,000。 最终结果将是股权价值减少750万美元。

86. Which of the following assumptions are made when using DV01 as a measure of interest rate risk? I. Changes in the interest rates are small. II. The yield curve is flat. III. Changes to the yield curve are parallel. IV. The yield curve is downward sloping.

A. I and III

B. I and II

C. I and IV

D. II and III

参考答案：A

【莽学解析】DV01 may not be a reliable measure when interest rates changes are not small. Also, when applying DV01 we assume that the yield curve shifts are parallel.当利率变化不小时，DV01可能不是一个可靠的衡量指标。同样，当应用DV01时，我们假设收益率曲线平移是平行的。

87. A zero-coupon bond with a maturity of 10 years has an annual effective yield of 10%. What is the closest value for its modified duration?

A. 9

B. 10

C. 99

D. 100

参考答案：A

【莽学解析】MAC.D=M.D*(1+y)MD=Mac.D/(1 y)=10/(1 10%)=9

88. Which of the following measurement approaches for assessing operational risk would be most appropriate for small banks?

A. Loss frequency approach

B. Basic indicator approach

C. Standardized approach

D. Advanced measurement approach (AMA)

参考答案：B

【莽学解析】Basic indicator approach is the most appropriate for small banks基本指标法在不太复杂、规模较小的银行中最为常见

89. A 30-year 4.0% semi-annual coupon bond has a price of $100.00 at a yield of 4.00%. At this

4.00% yield the bond has a modified duration of 17.380 years. If the yield drops by one basis point, to 3.99%, the price increases to $100.1740 and the duration increases to 17.3920 years. Which is nearest to the bond's convexity at a 4.0% yield? (significantly more difficult than an exam question)

A.95

B.422

C.1,646

D.4,333

参考答案：B

【莽学解析】C = d^2P/dy^2 × 1/P = [change in dollar duration/change in rate] × 1/P.In this case, without regard to the sign (＋/-), the change in dollar duration is given by Duration[at 3.99%]×Price[at 3.99%] - Duration[at 4.00%]×Price[at 4.00%], such that:Convexity (C) = [(100.1740×17.3920 - 100×17.380)/0.0001] × 1/100 = 421.89.Note the exact (analytical) convexity is equal to 420.8130 (very close!)C = d ^ 2P / dy ^ 2×1 / P = [美元持续时间/汇率变化]×1 / P。在这种情况下，不考虑符号（＋ /-），美元持续时间的变化由Duration [at 3.99%]×Price [at 3.99%]-Duration [at 4.00%]×Price [at 4.00%]给出 ，这样：曲度（C）= [（100.1740×17.3920-100×17.380）/0.0001]×1/100 = 421.89。请注意，精确的（分析性）曲度等于420.8130（非常接近！）

90.Your supervisor is an expert in market and credit risk. He recruits you to manage the operational risk department. He would like to use VaR to measure the firm's operational risk and proposes that you use the same VaR framework previously developed for market and credit risk. Which of the following arguments is a valid argument for why it is difficult to estimate an operational VaR using the same framework as market and credit VaR?

A.Market risk events are easier to map to risk factors than operational risk events.

B.Quantitative methods for estimating operational risk VaR do not exist.

C.Market and credit VaRs are estimated using only frequency distribution, but operational VaR is estimated using both a frequency distribution and a severity distribution.

D.Monte Carlo techniques cannot be used for an operational risk VaR because the underlying risk factors are not normally distributed.

参考答案：A

【莽学解析】Operational losses are not easy to map to risk factors. Operational VaR can be calculated by both severity and frequency distribution. Monte Carlo techniques can be used for other distributions than the normal distribution.操作损失很难映射到风险因素。 操作VaR可以通过严重程度和频率分布来计算。 蒙特卡洛模拟可用于除正态分布以外的其他分布

91.For which is duration LEAST appropriate?

A.Zero coupon bond

B.bond with fixed cash flows

C.Bond with embedded option

D.High convexity bond

参考答案：C

【莽学解析】Measures [based on the assumption of parallel yield shifts, such as duration] have two important weaknesses. First, they can be reasonably used only for securities with fixed cash flows. Second, the assumption of parallel yield shifts is not a particularly good one and, at times, is internally inconsistent.”措施[基于平行收益率变动的假设，例如期限]有两个重要的弱点

。 首先，它们只能合理地用于具有固定现金流量的证券。 其次，平行的收益率变动的假设并不是一个特别好的假设，而且有时内部不一致。

92.What is the price impact of a 10 basis point increase in yield on a 10-year par bond with a modified duration of 7 and convexity of 50?

A.-0.705%

B.-0.700%

C.-0.698%

D.-0.690%

参考答案：C

【莽学解析】Answer: C

$$\frac{\Delta P}{P} = -D^* \times \Delta y + \frac{1}{2} \times C \times (\Delta y)^2 = -7 \times 0.001 + \frac{1}{2} \times 50 \times 0.001^2 = -0.6975\%$$

93.The modified duration is 10.46 years of a bond with a current price of $716.38. What is the bond's DV01?

A.$0.40

B.$0.75

C.$1.25

D.Need more information (yield, maturity)

参考答案：B

【莽学解析】DV01 = modified duration × Price / 10,000 = 10.46 × 716.38 / 10,000 = $0.74933DV01 = modified duration × Price / 10,000 = 10.46 × 716.38 / 10,000 = $0.74933

94.Bonds issued by the XYZ Corp. are currently callable at par value and trade close to par. The bonds mature in 8 years and have a coupon of 8%. The yield on the XYZ bonds is 175 basis points over 8-year US Treasury securities, and the Treasury spot yield curve has a normal, rising shape. If the yield on bonds comparable to the XYZ bond decreases sharply, the XYZ bonds will most likely exhibit:

A.Negative convexity

B.Increasing modified duration

C.Increasing effective duration

D.Positive convexity

参考答案：A

【莽学解析】As yields in the market declines, the probability that the call option will get exercised increases. This causes the price to reduce relative to an otherwise comparable option free bond, which is also known as a negative convexity.当市场收益率下降时，看涨期权被行使的可能性增加。这导致其价格相对于无期权债券而言降低，也被称为负凸性。

95.An 8-year 5% coupon bond with at par value of 100 is currently trading at a price of 94.65. The price of this bond rises to 96.35 when interest rates fall by 30 basis points and falls to 92.75 when interest rates rise by 30. The effective duration of this bond is closest to:

A.5.99

B. 6.34

C. 6.69

D. 7.04

参考答案：B

【莽学解析】Answer: B

$$D_E = \frac{(V_- - V_+)}{2V_0\Delta y} = \frac{(96.35 - 92.75)}{2 \times 94.65 \times 0.003} = 6.34$$

96. A portfolio manager has a bond position worth USD 100 million. The position has a modified duration of eight years and a convexity of 150 years. Assume that the term structure is flat. By how much does the value of the position change if interest rates increase by 25 basis points?

A. USD -2,046,875

B. USD -2,187,500

C. USD -1,953,125

D. USD -1,906,250

参考答案：C

【莽学解析】

$$\Delta P = -MD \times P \times \Delta y + \frac{1}{2} \times C \times P \times (\Delta y)^2$$

$$= -8 \times 100 \times 0.0025 + \frac{1}{2} \times 150 \times 0.0025^2 = -1.953125$$

$$-1.953125 \times \frac{100,000,000}{100} = -1,953,125$$

97. Each of the following bond risk measures assumes a parallel shift in the yield curve EXCEPT FOR:

A. Duration

B. Convexity

C. Yield-based DV01

D. Key rate shift

参考答案：D

【莽学解析】Convexity is a single-factor model like duration. The idea of key rate shift is to enable different shifts for different maturities. 曲度是像持续时间一样的单因素模型。 关键利率转移的想法是为不同的到期日启用不同的转移

98. Calculate the Macaulay Duration of a two-year bond paying an annual coupon of 6% with yield

to maturity of 8%. Assume par value of the bond to be $1,000.

A. 2.00 years

B. 1.94 years

C. 1.87 years

D. 1.76 years

参考答案：B

【莽学解析】

Year	CF	PV	ω	ωT
1	60	55.56	5.76%	0.06
2	1060	908.78	94.24%	1.88
Total		964.34		1.94

Answer: B Year CF PV ω ωT 1 60 55.56 5.76% 0.06 2 1060 908.78 94.24% 1.88 Total 964.34 1.94 计算过程参照

99. Assume you own a security with a 2-year key rate exposure of $4.78, and you would like to hedge your position with a security that has a corresponding 2-year key rate exposure of 0.67 per $100 of face value. What amount of face value would be used to hedge the 2-year exposure?

A. $478

B. $239

C. $713

D. $670

参考答案：C

【莽学解析】0.67/100 × F = $4.78, F = $713.430.67/100 × F = $4.78, F = $713.43

100. A trading portfolio consists of two bonds, A and B. Both have modified duration of 3 years and face value of USD 1000, but A is a zero-coupon bond and its current price is USD 900, and bond B pays annual coupons and is priced at par. What do you expect will happen to the market prices of A and B if the risk-free yield curve moves up by 1 basis point?

A. Both bond prices will move up by roughly the same amount.

B. Both bond prices will move up, but bond B will gain more than bond A.

C. Both bond prices will move down by roughly equal amounts.

D. Both bond prices will move down, but bond B will lose more than bond A.

参考答案：D

【莽学解析】Answer: D Assuming parallel movements to the yield curve, the expected price change is: ΔP = -P×Δy × D where P is the current price or net present value Δy is the yield change D is durationAll else equal, a negative impact of yield curve move is stronger in absolute terms at the bond which is currently priced higher. Upward parallel curve movements makes bonds cheaper. 假设收益率曲线平行运动，预期价格变化是：ΔP = - P×D×Δy。P是当前价格或净现值Δy是收益率变化D时间一切平等，收益率曲线移动的负面影响是在绝对强大的债券目前价格更高。向上的平行曲线走势使债券更便宜。

101. Investing a putable bond can be seen as a combination of:

A. Long a bond and long a put

B. Long a bond and short a put

C. Short a bond and short a put
D. Short a bond and long a put
参考答案：A
【莽学解析】Answer: A Long a puttable bond is similar to long a bond and long a put.买入可出售债券类似于买入债券和买入看跌期权。

102. A portfolio manager uses her valuation model to estimate the value of a bond portfolio at USD 125.482 million. The term structure is flat. Using the same model, she estimates that the value of the portfolio would increase to USD 127.723 million if all interest rates fell by 30 basis points and would decrease to USD 122.164 million if all interest rates rose by 30 basis points. Using these estimates, the effective duration of the bond portfolio is closest to:
A. 7.38
B. 8.38
C. 14.77
D. 16.76
参考答案：A
【莽学解析】Answer: A

$$D = \frac{V_- - V_+}{2 \times V_0 \times \Delta y} = \frac{127.723 - 122.164}{2 \times 125.482 \times 0.003} = 7.38$$

103. Consider a 9-year bond with a semi-annual 10.0% coupon that has a current price of $119.780 and a yield of 7.000%. If the yield drops to 6.850%, the bond's price increases to $120.900. If this is the case, then which of the following is nearest to the bond's dollar value of '01 (DV01)?
A. -0.0121
B. 0.0121
C. 0.0747
D. 1.1200
参考答案：C
【莽学解析】DV01 = 0.0747. The price change is $120.900 - $119.780 = $1.120 given a 15 basis point drop in the yield, which is $1.120/15 = 0.0746667 per basis point. Note that strictly (technically) the DV01 is the price change associated with a decrease of one basis point. This will be almost identical the price change associated with an increase of one basis point, but it won't be exactly the same.DV01 = 0.0747。 考虑到收益率下降15个基点，价格变化为120.900美元-119.780美元= 1.120美元，即每个基点$ 1.120 / 15 = 0.0746667美元。 请注意，严格说来（技术上）DV01是指价格变动与一个基点的下降有关。 与增加一个基点相关的价格变化几乎相同，但不会完全相同。

104. Which one of the following cases or events can be considered as resulting from operational risk?
A. A bank reports losses on a diversified portfolio of stocks during the stock market decline.
B. The bank becomes embroiled in a high-profile lawsuit with a customer that accuses it of improper selling practices.
C. The bank reports the loss of $1.5 billion due to rises in interest rates.
D. A U.S. investor makes a loss as the yen depreciates relative to the dollar.

参考答案：B
【莽学解析】Answer: B Litigation belongs to legal risk and legal risk belongs to operational risk.诉讼属于法律风险，法律风险属于操作风险。

105.Which of the following statements about STRIPS is correct? I. SIRIPS ave less interest rate sensitivity than coupon bonds. II. Tend to be highly liquid.
A.\u2160 only
B.\u2161 only
C.Both \u2160 and \u2161
D.Neither \u2160 nor \u2161
参考答案：D
【莽学解析】STRIPS can be relatively illiquid and have more interest rate sensitivity than coupon bonds. Because of the cost to strip/reconstitute, only large institutional investors can potentially profit from doing So. STRIPS are often used with hedging strategies for asset-liability management such as matching maturity dates with a liability stream.本息剥离债券的流动性相对较差，对利率的敏感度也高于票面债券。

106.The modified duration is 10.46 of a bond with a current price of $716.38. Once the yield rise 1 basis point, what is the bond’s price change?
A.$-0.40
B.$-0.75
C.$-1.25
D.Need more information (yield, maturity)
参考答案：B
【莽学解析】Answer: B △P=-D*P*△y=-10.46×716.38×0.0001=-0.7493△P=-D×P×△y=-10.46×716.38×0.0001=-0.7493

107.A market maker sells (writes) $100 million face value of call options on underlying bonds when the interest rate is 4.0%. The price of the call options is $3.0 million and their (modified) duration is 80.0 years. At the same 4.0% rate, as the underlying bonds pay a 4.0% coupon, the price of the underlying happens to equal $100 par with a duration of 7.0 years. What is the market maker’s hedge transaction?
A.Short $12.9 million of underlying bond
B.Short $24.0 million of underlying bond
C.Long $24.0 million of underlying bond
D.Long $34.3 million of underlying bond
参考答案：D
【莽学解析】The DV01 of the written call options, DV01 = P×D/10000 = 3 million×80/10000 = $24,000 or $240 per 100 face.To hedge, the market marker should buy P = DV01×10,000/D = 240 × 10,000 / 7 = $342,857 per 100 face or $34.285 million in the underlying bond.卖出看涨期权的DV01，DV01 = P×D / 10000 = 300万×80/10000 = 24,000美元或每100张面240美元。为了进行套期保值，市场参与者应该购买P = DV01×10,000 / D = 240×10,000 / 7 =每100张面342,857美元或相关债券的3,488.5万美元。

108.An investment in a callable bond can be analytically decomposed into a:
A.Long position in a non-callable bond and a short position in a put option

B. Short position in a non-callable bond and a long position in a call option
C. Long position in a non-callable bond and a long position in a call option
D. Long position in a non-callable bond and a short position in a call option
参考答案：D
【莽学解析】Answer: D A callable bond includes an embedded option for the issuer to call the bond at a stated redemption or call price. If the issuer is long the call option, then the holder of a callable bond is short the call option.可赎回债券包括一个内含期权，允许发行方按规定的赎回价格赎回债券。如果发行者持有看涨期权，那么可赎回债券的持有者就卖空看涨期权。

109. A and B are two perpetual bonds, i.e., their maturities are infinite. A has a coupon of 4 percent and B has a coupon of 8 percent. Assuming that both bonds are trading at the same yield, what can be said about the modified duration of these bonds?
A. The duration of A is greater than the duration of B.
B. The duration of A is less than the duration of B.
C. A and B both have the same duration.
D. None of the above.
参考答案：C
【莽学解析】Answer: CThe modified duration of perpetuity (consol bond) is 1/y, where “y” is the yield to maturity. Since both trade at the same yield, they must both have the sine duration.永续债券的修正久期是1/y，y为到期收益率。由于两者的收益率相同，因此它们都必须具有相同的久期。

110. At a rate of 4.00% a bond has a price of $107.93. If the rate drops by one basis point to 3.99%, the bond price increases to $108.00. What is an estimate of the bond's effective duration?
A. 5.83 years
B. 6.49 years
C. 7.21 years
D. 8.55 years
参考答案：B
【莽学解析】The bond's DV01 = $108.00 - 107.93 = $0.07,and since D× = DV01×10,000/P,D× = 0.07×10,000/107.93 = 6.486.Alternatively, we can use D× = -1/p×dP/dy = =1/p×slope, where slope is rise/run = (108.00- 107.93)/(4.00% - 3.99%), such that 1/P×dP/dy = [(108.00-107.93)/107.93]/(4.00% - 3.99%) = 6.486 years债券的DV01 = $108.00 ? 107.93 = $0.07, and since D× = DV01×10,000/P,D?= 0.07×10,000/107.93 = 6.486.或者，D = —1/p×dP/dy = =1/p×slope, where slope is rise/run = (108.00—107.93)/(4.00% —3.99%), such that 1/P×dP/dy = [(108.00—107.93)/107.93]/(4.00% —3.99%)= 6.486 years

111. Which of the following correctly describe the similarities between Operational VaR and Market VaR? I Both VaRs, when used for regulatory capital measurement, need to be validated against actual loss experience. II Both are built on data (market prices for Market VaR and operational loss data for Operational VaR) that is readily available. III Both are modeled based on a normal distribution. IV Extreme Value Theory can be used to model extreme losses at the tail of the distribution for both Operational and Market VaR.
A. I and IV
B. I, II and III

C. I, II and IV
D. II, III and IV
参考答案：A
【莽学解析】I and IV are correct comparisons. II is not a correct comparison. While market risk data is readily available, operational losses (especially extreme operational losses) data are relatively sparse and pose significant difficulty for operational VaR modeling. III is not a correct comparison. Other statistical distributions also are in use for modeling VaR. E.g, an operational VaR can be derived from convolution of a frequency distribution (e.g. Poisson distribution) and a severity distribution (e.g. lognormal distribution). I和IV是正确的比较。II是不正确的比较。 尽管市场风险数据随时可用，但运营损失（尤其是极端运营损失）数据相对稀疏，给操作VaR建模带来了巨大困难。III是不正确的比较。 其他统计分布也用于建模VaR。 例如，可以从频率分布（例如泊松分布）和严重性分布（例如对数正态分布）的卷积中得出可操作的VaR

112. Which of the following characteristics do not describe top-down approaches to operational risk measurement compared to bottom-up approaches? I Relatively simple. II Ability to differentiate high-frequency, low-severity events from low-frequency, high-severity events. III Dissect processes into individual components. IV Modest data requirements.
A. I and IV
B. III only
C. II and III
D. I, II, and IV
参考答案：C
【莽学解析】Top-down models rely primarily on aggregate historical data. Therefore, they are relatively simple and do not differentiate between high-frequency low-severity events and low-severity, high-frequency events because both are pooled together in the data. The aggregated nature of the data also limits the amount of data used in these models. A limitation of aggregated data, however, is that top-down models do not have diagnostic capabilities like bottom-up models that dissect processes into individual components. 自上而下的模型主要依赖于汇总的历史数据。 因此，它们相对简单，并且不会在高频低严重性事件和低严重度高频事件之间进行区分，因为两者都集中在数据中。 数据的聚合性质也限制了这些模型中使用的数据量。 但是，聚合数据的局限性在于自上而下的模型没有像自下而上的模型那样将进程分解为各个组件的诊断功能。

113. Using key rates of 2-year, 5-year, 7-year, and 20-year exposures assumes all of the following except that the:
A. 2-year rate will affect the 5-year rate
B. 7-year rate will affect the 20-year rate
C. 5-year rate will affect the 7-year rate
D. 2-year rate will affect the 20-year rate
参考答案：D
【莽学解析】Key rate exposures assume that key rates chosen adjacent to the rate of interest are affected, not across other key rates. 一个关键利率的移动，只会影响相邻的两个关键利率之间的利率变动，而2年期关键利率和20年期关键利率是不相邻的，所以2年期关键利率不会影响20年期关键利率。

114. A speculative (aka, junk) bond has 15.0 years to maturity and pays a semi-annual 6 1/8 coupon; i.e., its coupon rate is 6.125% payable semi-annually. Its yield is 11.00%. If we assume a reasonable shock value (i.e., less than 100 basis points), which of the following is

nearest to the bond's effective convexity?
A.12.4 years^2
B.98.0 years^2
C.124.3 years^2
D.Cannot answer because face value is not given
参考答案：B
【莽学解析】In this case, the initial price = -PV(0.1100/2,15×2,100×0.06125/2,100) = $64.574, and if the yield shock is ＋/- 50 bps, then:Price(yield 0.0050) = -PV(0.1150/2,15×2,100×0.06125/2,100) = $61.996, andPrice(yield - 0.0050) = -PV(0.1050/2,15×2,100×0.06125/2,100) = $67.310.In regard to false (D), please note that the convexity will be unchanged if we (consistently) change the face value to any amount. Further, while the convexity will vary very slightly as we alter the shock value, it is approximately 98.0 years for shock values below 1.0%. 在这种情况下，初始价格-PV(0.1100/2,15×2, 100×0.06125/2, 100) = $64.574 Price(yield 0.0050) = -PV(0.1150/2, 15×2, 100×0.06125/2, 100) = $61.996, and Price(yield- 0.0050) = -PV(0.1050/2, 15×2, 100×0.06125/2, 100) = $67.310. 关于（D）是错误的，请注意，如果我们（一致地）将面值更改为任意值，则曲度将保持不变。此外，虽然随着我们更改冲击值，曲度会非常微小地变化，但是对于低于1.0％的冲击值，大约需要98.0年。

115.An options dealer sells equity call options. When sold, the options are at-the-money and the firm will be delta-neutral hedged. Which of the following statements is correct? I The options dealer will have a negative gamma and negative vega exposure. II Over time, gamma and vega will have less of an impact on the value of the option dealer's position if the option moves away from the money.
A.I only
B.II only
C.Both I and II
D.Neither I nor II
参考答案：C
【莽学解析】Because the options dealer has sold options, the dealer will have a negative gamma and negative vega exposure. When sold, the options are at-the-money, but over time the options will move in or out-of-the-money. Gamma and vega decline as the options move away from an at-the-money position, so gamma and vega will have less of an impact on the value of the option over time. Hence the correct answer is both I and II.由于期权交易商已售出期权，因此经销商将具有负的伽玛值和负的vega风险。 售出时，这些期权是平价的，但是随着时间的流逝，这些期权将变价或变价。随着期权远离平价合约，gamma和vega贬值，因此随着时间的推移，gamma和vega对期权价值的影响较小。 因此，正确答案是I和II。

116.Call and put option values are most sensitive to changes in the volatility of the underlying when:
A.Both calls and puts are deep in-the-money.
B.Both puts and calls are deep out-of-the-money.
C.Calls are deep out-of-the-money and puts are deep in-the-money.
D.Both calls and puts are at-the-money.
参考答案：D
【莽学解析】Vega measures the sensitivity of the option value to changes in volatility. vega is at a maximum when calls and put options are at-the-money.Vega衡量期权价值对波动率变化的敏感性。

当看涨期权和看跌期权平价时，vega达到最大值。trader

117.In sequence FROM LOWEST to highest value of option delta, what is the correct order of the following four options: in-the-money (ITM) call option, out-of-the-money (OTM) call option, in-the-money (ITM) put option, and out-of-the-money (OTM) put option?
A.OTM put, OTM call, ITM call, ITM put
B.OTM call, ITM call, ITM put, OTM put
C.ITM call, ITM put, OTM put, OTM call
D.ITM put, OTM put, OTM call, ITM call
参考答案：D
【莽学解析】ITM put has lowest value as deep ITM put approaches -1.0OTM put has next highest value as deep OTM put approaching zero but always negativeOTM call has next highest value as deep OTM call approaching zero but always positive, and ITM call has highest value as deep ITM call approaching 1.0深度价内认沽权逼近-1.0，价内认沽权具有最低的价值由于深层价外认沽权接近零但始终为负，因此价外认沽权具有次高价值随着深层价外看涨期权接近零，但价外看涨期权具有第二高的值，但始终为正；而深层价内看涨期权接近1.0，价内看涨期权具有最高的价值。

118.A portfolio of short calls and short puts is delta-neutral and the options are, on average, at-the-money (ATM) with near-term maturities. Which of the following is most likely true about the portfolio's theta?
A.Large and negative
B.Small and negative
C.Small and positive
D.Large and positive
参考答案：D
【莽学解析】As the maturity decreases, the position gamma of ATM options tends to increase (decrease) for long (short) options. Short call options and short put options both have negative position gamma. Therefore, portfolio of entirely short positions in generally near-term, ATM options will tend to have a large and negative position gamma.rf=theta+rS_0×delta+1/2 σ^2 〖S_0〗^2×gammabut if delta = 0 (delta neutral), then:theta+1/2 σ^2 〖S_0〗^2×gamma=+constant, such that:If delta-neutral, then, the theta will tend to be large and positive.随着到期日的减少，买（卖）期权的平价期权的γ趋于增加（减小）。 卖看涨期权和卖看跌期权均具有负γ。 因此，通常在短期内，平价期权中的完全空头头寸的投资组合往往会具有较大的负头寸系数。rf=theta rS_0×delta 1/2 σ^2 〖S_0〗^2×gammabut if delta = 0 (delta neutral), then:theta 1/2 σ^2 〖S_0〗^2×gamma= constant,如果delta中性，那么theta趋向于较大且负的正的gamma头寸。

119.An equity options trader is short a call option of a stock with strike at $104. The maturity of the option is within half an hour and the current price is $103.75. Which of the following Greeks poses the highest risk to his position?
A.Delta
B.Gamma
C.Rho
D.Theta
参考答案：B
【莽学解析】Delta is greatest for in-the-money options.Gamma is greatest for short-term at-the-

money options. Given the traders is short the option, the gamma poses the highest risk to his position.Rho is the rate of change of the option with respect to the interest rate. The longer the time to expiration, the more sensitive is the option value to changes in the interest rate.Theta measures the change in an option price with respect to the passage of time. Time decay is more severe for short-term options that are at the money.Delta是平价期权最好的选择。gamma最适合短期的平价期权。 鉴于交易者做空期权，gamma对他的头寸构成最大风险。Rho是期权相对于利率的变化率。 到期时间越长，期权价值对利率的变化越敏感。Theta衡量期权价格随时间的变化。 对于平价短期期权，时间衰减更为严重

120.The current price of a stock is $25. A put option with a $20 strike price that expires in six months is available. N(d1)=0.9737 and N(d2)=0.9651. If the underlying stock exhibits an annual standard deviation of 25%, and the current continuously compounded risk-free rate is 4.25%, the Black-Scholes-Merton value of the put is closest to:

A.$0.01

B.$0.03

C.$0.33

D.$0.36

参考答案：B

【莽学解析】

$$put = Ke^{-rT}N(-d_2) - SN(-d_1) = 20 \times e^{-4.25\% \times 0.5} \times (1 - 0.9651) - 25 \times (1 - 0.9737)$$
$$= 0.03$$

121.A non-dividend-paying stock has a current price of $10 and a volatility of 12% per annum. The risk-free rate is 4.0%. We use a twelve-step binomial model to value a one-year European-style put option on the stock; i.e., each step is one month. What is the second-largest stock price among all of the nodes on the binomial tree?

A.$14.64

B.$19.68

C.$23.29

D.$97.15

参考答案：A

【莽学解析】The largest value is the top-most node at the end of the year: S(0)u^12. The second largest must be the one month's prior node, S(0)u^11, as it must be higher than the second-highest node at maturity which is S(0)u^11 d. Keep in mind we assume a recombining tree, and in a recombining tree the communicative property applies; e.g. S(0)×u×d = S(0)×d×u. As u= 1.0352, this node given by: S(0)u^11=$14.638 最大价值的时间节点在年末发生： S(0)u^12，第二大的节点必定是一个月前的节点：S(0)u^11，因为最大节点一定大于第二大的节点。请记住我们假定一个重组树，在树叉间的属性应用结合起来制成。 当u= 1.0352，这个节点为S(0)u^11=$14.638

122.Consider a six-month at-the-money (ATM) European call option on a non-dividend-paying stock with a current price of $80.00. Peter the Risk Analyst has employed a two-step (i.e., three months per step) binomial model to price the option, as displayed below:

Peter's model matches the up and down movements to his estimate of the stock's prospective

Today	3 months	6 months
		112.396 (32.396)
	94.824 (15.620)	
80.000 (7.532)		80.000
	67.493	
		56.942

volatility, which he assumes is 34.0% per annum. The risk-free rate is 4.0%. Which of the following is nearest to the risk-neutral probability of the stock price going up in a single step?

A. 45.61%

B. 46.44%

C. 48.70%

D. 52.52%

参考答案：C

【莽学解析】

$$u = e^{\sigma\sqrt{\Delta t}} = e^{0.340\sqrt{0.250}} = 1.18530$$

$$d = e^{-\sigma\sqrt{\Delta t}} \text{ or } 1/u = 0.84366$$

$$p = \frac{e^{r\times\Delta t} - d}{u - d} = \frac{e^{0.040\times 0.25} - 0.84366}{1.18530 - 0.84366} = 0.4870195$$

123. The spot price of oil is $80.00 per barrel with a volatility of 26% per annum. The risk-free rate is 5.0% per annum. What is the delta of a one-year futures contract when the one-year futures price is $90.00 per barrel?

A. 0.951

B. 1.000

C. 1.051

D. 1.118

参考答案：C

【莽学解析】Delta of forward =e^(-qT) and delta of futures = e^((r-q)T). In this case, delta =

e^(5%) =1.051.The other information is unnecessary.远期的delta=e^(－qT)，期货的delta=e^((r－q)T)。在这道题中，delta = e^(5%) =1.051. 题干中其他信息都是干扰信息。

124.Twelve days ago (T-12 days), a European call option with a price of $4.80 had a theta of -6.30 per year. Between then and today (T0), no stochastic option inputs have changed; i.e., stock price, volatility and risk-free rate are unchanged. What is the today's estimate of the option price, as reduced by only time decay, assuming 252 trading days per year?

A.$3.36

B.$4.50

C.$4.63

D.$4.77

参考答案：B

【莽学解析】Estimated change in option value = $-6.30×12/252 = $-0.30.Estimated option price = $4.80 + ($-6.30×12/252) = $4.50期权价值中的变化估计：= $－6.30×12/252 = $－0.30.期权价格的估计= $4.80 ＋($－6.30×12/252) = $4.50

125.As an in-the-money option approaches expiration, the rate of decay of its value:

A.rises

B.falls

C.stays constant

D.becomes volatile

参考答案：A

【莽学解析】As an option approaches its expiration, the rate of decay of an option accelerates due to loss of time value.当期权到期时，期权的衰减率会由于时间价值的损失而加快。

126.A European call option has a time to maturity of six months on a stock with a 2% dividend yield. The current stock and strike prices are both $50. The volatility of the stock is 18% per annum. The risk free rate is 4%. What is the price of the call option?

A.$2.00

B.$2.75

C.$3.08

D.$3.16

参考答案：B

【莽学解析】

$$d_1 = \frac{\ln(S_0/K) + \left(r - q + \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}} = 0.1422;\ d_2 = 0.0149$$

$$N(d_1) = 0.5565 \text{ and } N(d_2) = 0.5060$$

$$c = S_0 e^{-qT} N(d_1) - K e^{-rT} N(d_2) = \$2.753$$

127.What is, respectively, the delta of an at-the-money (ATM) six-month European call and put

option on a non-dividend-paying stock when the riskless rate is 4.0% per annum and the stock price volatility is 28%?

A. 0.20 (ATM call) and -0.20 (ATM put)

B. 0.20 (ATM call) and -0.80 (ATM put)

C. 0.58 (ATM call) and -0.58 (ATM put)

D. 0.58 (ATM call) and -0.42 (ATM put)

参考答案：D

【莽学解析】

$$d_1 = \frac{\ln(S_0/K)+\left(r+\frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$, If S=K, then LN(S/K) = LN(1) = 0, such that: $d_1 = 0.2000$

call delta = $N(d_1) = 0.5793$, such that put delta = $N(d_1) - 1 = -0.4207$

128. Each of the following is an underlying assumption of the basic Black-Scholes option pricing model EXCEPT:

A. The stock price follows a geometric Brownian motion (GBM) which is a continuous process without jumps

B. The continuously compounded rate of return on the stock is normally distributed, such that the distribution of the future stock price is lognormal

C. The expected rate of return on the stock (u) and volatility (sigma) are constant

D. The expected real-world (risky) rate of return on the stock is known and the value of the option is an increasing function of this rate of return

参考答案：D

【莽学解析】While the drift rate (%) is assumed constant, per the risk-neutral valuation, we let drift rate equal the riskless rate. The real-world rate of return is not required, is not an input in the Black-Scholes, and as Hull explains, is not an increasing function of the option (as a higher implied discount rate offsets the higher expected growth rate). In regard to (A), (B) and (C), EACH is TRUE as a key assumption underlying the Black-Scholes OPM. 而漂移率(%)假定常数,根据风险中性估值,我们让漂移率等于无风险利率。现实世界的收益率不是必需的，不是Black-Scholes模型的一个输入，也不是期权的一个递增函数(因为更高的隐含贴现率抵消了更高的预期增长率)。选项A，B，C都是正确的。

129. Ms. Zheng is responsible for the options desk in a London bank. She is concerned about the impact of dividends on the options held by the options desk. She asks you to assess which options are the most sensitive to dividend payments. What would be your answer if the value of the options is found by using the Black-Scholes model adjusted for dividends?

A. Everything else equal, out-of-the-money call options experience a larger decrease in value than in-the-money call options as expected dividends increase.

B. The increase in the value of in-the-money put options caused by an increase in expected dividends is always larger than the decrease in value of in-the-money call options.

C. Keeping the type of option constant, in-the-money options experience the largest absolute change in value and out-of-the-money options the smallest absolute change in value as expected dividends increase.

D. Keeping the type of option constant, at-the-money options experience the largest absolute

change in value and out-of-the-money options the smallest absolute change in value as a result of dividend payment.

参考答案：C

【莽学解析】OTM call options are not very sensitive to dividends, so answer A is incorrect. This also shows that in the money options have the highest ρ × in absolute value.平价看涨期权对股息不是很敏感，因此答案A是不正确的。 这也表明，在货币期权中，绝对值具有最高的ρ。

130. Steve, a market risk manager at Marcat Securities, is analyzing the risk of its S&P 500 index options trading desk. His risk report shows the desk is net long gamma and short vega. Which of the following portfolios of options shows exposures consistent with this report?

A. The desk has substantial long-expiry long call positions and substantial short-expiry short put positions.

B. The desk has substantial long-expiry long put positions and substantial long-expiry short call positions.

C. The desk has substantial long-expiry long call positions and substantial short-expiry short call positions.

D. The desk has substantial short-expiry long call positions and substantial long-expiry short call positions.

参考答案：D

【莽学解析】The portfolio account shows a net long Gamma, short Vega, which means Gamma>, 0, Vega<0. For Gamma, the shorter the duration, the larger the Gamma, the longer the duration, the smaller the Gamma, It might be easier to put in Numbers. So the short term gamma is equal to 7, and the long term gamma is equal to 3. For Vega, the longer the term, the greater the Vega. Here, make the short term Vega=4, and the long term Vega=6; Long corresponds to “+”, and Short to “-”. To meet the requirements of the title, see the following table:

	Gamma	Vega
long-expiry	-3	-6
short-expiry	7	4
net	+4	-2

So, the desk has substantial short-expiry long call positions and substantial long-expiry short call positions.

131. An analyst is doing a study on the effect on option prices of changes in the price of the underlying asset. The analyst wants to find out when the deltas of calls and puts are most sensitive to changes in the price of the underlying. Assume that the options are European and that the Black-Scholes formula holds. An increase in the price of the underlying has the largest absolute value impact on delta for:

A. Deep in-the-money calls and deep out-of-the-money puts

B. Deep in-the-money puts and calls
C. Deep out-of-the-money puts and calls
D. At-the-money puts and calls
参考答案：D
【莽学解析】When both calls and puts are at-the-money, deltas are most sensitive to changes in the underlying asset. (Gammas are largest when options are at-the-money)当看跌期权和看跌期权都处于平价状态时，增量对基础资产的变化最为敏感。 （如果选择平价股票，gamma最大）

132. A company's stock price is $100.00 and 50.0 million shares are outstanding, so that its equity market capitalization is $5.0 billion. The company is considering granting 2.0 million at-the-money employee stock options (ESOs) because it has been advised that a grant equal to 4.0% of the outstanding is competitive. The ESOs have a 10 year maturity, and for analytical convenience we assume there are no vesting restrictions (an unrealistic assumption). Option exercises will be handled by issuing more shares. The stock price volatility is 26.0% per annum. The 10-year risk-free rate is 4.0%. The company has no plans to pay dividends. Which is nearest to the total cost of the warrant issue?
A. $31.2 million
B. $44.3 million
C. $88.5 million
D. $109.7 million
参考答案：C
【莽学解析】The BSM price of the option is $46.00, such that the cost to the company per option is 50.0/(50.0 + 2.0) × $46.0 = $44.2308, and the total cost is about $44.2308 × 2.0 million = $88.46 million. Note that If the market perceives no benefit from the warrant issue, the reduced market cap is about $4.912 billion and a per-share reduction of stock price of about $1.77; i.e., new share price of about $98.23.期权的BSM价格是$46.00，则每个期权需要花费50.0/(50.0 2.0)× $46.0 = $44.2308，总花费为44.2308 × 2.0 million = $88.46 million。值得注意的是，若市场认为权证发行没有带来任何好处，则减持后的市值约为49.12亿元，每股股价下跌约1.77元；即，新股价格约为98.23元。

133. Consider the following call option which is re-priced after a mild + 3.0% shock to its volatility. In both cases, the stock = strike = $50 (i.e., at an-the-money call option), the risk-free rate is 2.0% and the maturity is one year: When volatility is 30.0%, the option price is $6.41 When volatility increases to 33.0%, the option price is $6.99 Which is nearest to the option's vega?
A. 0.19
B. 0.580
C. 19.33
D. 58.40
参考答案：C
【莽学解析】19.33 = (6.99 - 6.41)/(0.33 - 0.30)19.33 = (6.99 - 6.41)/(0.33 - 0.30)

134. The current price of the S&P 500 Index is 1200. The one-year futures price is 1262; i.e., +5% continuously compounded. The volatility of the index is 18% per annum and the dividend yield is 2.0% per annum. If the risk-free rate is 4.0% per annum, what is the detla of the one-year futures contract on the S&P 500 Index?

A. 0.9802
B. 1.0000
C. 1.0202
D. 1.0408
参考答案：C
【莽学解析】Delta =e^((r-q)T)= 1.0202Delta =e^((r-q)T)= 1.0202

135. You are given the following information about a call option: Time to maturity = 2 years Continuous risk-free rate = 4% Continuous dividend yield = 1% N(d1) = 0.64 Calculate the delta of this option.
A. -0.64
B. 0.36
C. 0.63
D. 0.64
参考答案：C
【莽学解析】The delta of a call option with a continuous dividend yield is given by the following formula:

$$\text{Delta} = e^{-qT}N(d_1) = 0.64 \times e^{-1\% \times 2} = 0.63$$

136. An analyst is doing a study on the effect on option prices of changes in the price of the underlying asset. The analyst wants to find out when the deltas of calls and puts are most sensitive to changes in the price of the underlying. Assume that the options are European and that the Black-Scholes formula holds. An increase in the price of the underlying has the largest absolute value impact on delta for:
A. Deep in-the-money calls and deep out-of-the-money puts.
B. Deep in-the-money puts and calls.
C. Deep out-of-the-money puts and calls.
D. At-the-money puts and calls.
参考答案：D
【莽学解析】A is incorrect. When calls are deep in-the-money and puts are deep out-of-the-money, deltas are NOT most sensi?tive to changes in the underlying asset. B is incorrect. When both calls and puts are deep in-the-money, deltas are NOT most sensitive to changes in the underlying asset. C is incorrect. When both calls and puts are deep out-of-the-money, deltas are NOT most sensitive to changes in the underlying asset. D is correct. When both calls and puts are at-the-money, deltas are most sensitive to changes in the underlying asset. (Gammas are largest when options are at-the-money.)期权在平值状态下gamma最大，即delta对标的资产价格变化最为敏感。

137. Suppose a financial institution has a portfolio that contains the following four positions in options on a stock: I. A long position in 20,000 call options and the delta of each of these option is 0.620. II. A short position in 10,000 call options and the delta of each of these options is 0.550. III. A long position in 20,000 put options and the delta of each of these

options is -0.470. IV. A short position in 10,000 put options and the delta of each of these options is -0.430. Which trade will make the portfolio delta neutral?

A. Short 1,800 shares

B. Short 4,350 shares

C. Long 2,250 shares

D. Long 3,700 shares

参考答案：A

【莽学解析】The position delta of the portfolio = (+1)×20,000×0.620 + (-1)×10,000×0.550 + (1)×20,000×-0.470 + (-1)×10,000×-0.430 = +1,800. Therefore to neutralize delta, the trade is to short (sell) 1,800 shares (each share has a delta of 1.0).资产组合的delta为(＋1)×20,000×0.620 ＋(－1)×10,000×0.550＋ (1)×20,000×－0.470＋ (－1)×10,000×－0.430 = ＋1,800.因此，要抵消差价，交易就是做空（卖出）1800股（每股差值为1.0）。

138. Which of the following portfolios would have the highest vega assuming all options involved are of the same strikes and maturities?

A. Long a call

B. Short a put

C. Long a put and long a call

D. A short of the underlying, a short in a put, and a long in a call

参考答案：C

【莽学解析】A and B are standard call/put, C is a straddle, D is a collar. A collar limits exposure to volatility, while a straddle increases this exposure. vega is the sensitivity of a portfolio to volatility.A和B是标准买入/卖出，C是跨式期权，D是collar。 collar限制了波动性，而straddle则增加了这种波动性。 vega是投资组合对波动的敏感性。

139. The risk-free rate is 3.0% per annum while the price of a non-dividend-paying stock is $120.00. For a European call option with a strike price of $100.00 and one year maturity, the Black-Scholes-Merton (BSM) option pricing model returns $27.50 for the value of this in-the-money call; i.e., S(0) = $120.00, K = $100.00, σ = 30%, T = 1.0 year, and r = 3.0% informs price of (c) = $27.50. The risk-neutral probability that the option will be exercised (equivalently, that it will expire in-the-money), N(d2), is 71.0%. Which is nearest to the option's delta?

A. 0.559

B. 0.620

C. 0.714

D. 0.803

参考答案：D

【莽学解析】Because call=S_0 N(d_1)-Keˆ(-rT) N(d_2) N(d_1)=0.8033 call=S_0 N(d_1)－Keˆ(－rT) N(d_2) N(d_1)=0.8033

140. Each of the following is an underlying assumption of the Black-Scholes option pricing model EXCEPT:

A. There are no transactions costs or taxes. All securities are perfectly divisible.

B. There are no riskless arbitrage opportunities.

C. Short selling is NOT permitted

D. Security trading is continuous.

参考答案：C
【莽学解析】The stock price follows the process developed in GBM with drift rate (% not $) and variance/volatility constant. The short selling of securities with full use of proceeds is permitted. There are no transactions costs or taxes. All securities are perfectly divisible. There are no dividends during the life of the derivative. There are no riskless arbitrage opportunities. Security trading is continuous. The risk-free rate of interest, r, is constant and the same for all maturities. 允许对收益充分利用的证券进行卖空。没有交易成本或税收。所有的证券都是完全可分的。在衍生品的生命周期内没有股息。不存在无风险的套利机会。证券交易是连续的。无风险利率r是常数，对所有期限都是一样的。

141.The dividend yield of an asset is 10% per annum. What is the delta of a long forward contract on the asset with 6-month to maturity?
A.0.95
B.1.00
C.1.05
D.Cannot be determined without further information.
参考答案：A
【莽学解析】The delta of the forward 〖e〗^(-qT)=e^(-10%×0.5)=0.95远期的delta为〖e〗^(－qT)=e^(－10%×0.5)=0.95

142.Assume 250 trading days in the year. When the underlying stock has a volatility of 50.0% per annum and the risk-free rate is 4.0%, an at-the-money (ATM) European call option, with a strike price of $100.00 and a maturity of 125 trading days (0.5 years), has a price of $14.90 and a theta of -15.50 per year. Which is a good approximation of the option's price in ten (10) days, if no other variables change?
A.$12.74
B.$13.90
C.$14.28
D.$15.15
参考答案：C
【莽学解析】$14.90 - ($15.50×10/250) = $14.28 (actual price is $14.2725)$14.90 －($15.50×10/250) = $14.28 (真实价格为 $14.2725)

143.Martha used a three-step binomial model to value a (long-term) put option with three years to maturity; i.e., each time step is one year. While the risk-free rate is 4.0%, the underlying asset's volatility is 28.480%. Using these assumptions, she was pleasantly surprised to see that the risk-neutral probability of up movement in her model as 50.0%; i.e., p = d = 0.50. However, she forgot to include the assumption that the asset will pay a continuous dividend of 2.0% per annum. By how much will this assumption change her mode's risk-neutral probability of a down (d) movement?
A.Decrease probability of down movement, (d), by about 10.79% percentage points
B.Decrease probability of down movement, (d), by about 3.57% percentage points
C.Increase probability of down movement, (d), by about 3.57% percentage points
D.Increase probability of down movement, (d), by about 10.79% percentage points
参考答案：C
【莽学解析】

Under the initial set of assumptions, $u = e^{\sigma\sqrt{\Delta t}} = e^{0.2840\sqrt{1}} = 1.32950$ and $d = 1/1.32950 = 0.75216$, such that $p = d = 0.50$.

If the dividend is included, then $p = \frac{e^{(r-q)\Delta t} - d}{u-d} = 0.46427$. Therefore, $d = 1 - 0.46427 = 0.53573$, and the increase is about 3.570%.

144.Which of the following statements is false?

A.European-styled call and put options are most affected by changes in vega when they are at-the-money.

B.The delta of a European-styled put option on an underlying stock would move towards zero as the price of the underlying stock rises.

C.The gamma of an at-the-money European-styled option tends to increase as the remaining maturity of the option decreases.

D.Compared to an at-the-money European-styled call option, an out-of-the-money European option with the same strike price and remaining maturity would have a greater negative value for theta.

参考答案：D

【莽学解析】Vega is highest for at-the-money options.The delta for a European put option is negative, and delta moves towards zero, as the price of the underlying stock increases.Gamma increases as the time to maturity decreases.Theta is large and negative for an at-the-money European-styled option, while theta is close to zero when the price for the underlying stock is very low. Therefore the theta for an out-of-the-money European styled call option would have a lower negative value compared to that of an at-the-money European-styled call option.Vega是性价比最高的选择。欧洲看跌期权的差额为负，并且随着基础股票价格的上涨，差额接近零。伽玛值随着成熟时间的减少而增加。Theta很大，对于平价的欧式期权来说是负数，而当基础股票的价格非常低时，theta接近于零。 因此，与平价欧洲风格看涨期权相比，价外欧式看涨期权的theta负值更低。

145.A stock price is USD 50 with a volatility of 22%. The risk free rate is 3%. Use the Black-Scholes-Merton formula to value (a) a European call option and (b) a European put option when the strike price is USD 50, and the time to maturity is nine months.

A.4.3/2.3

B.4.3/3.2

C.3.4/2.3

D.3.4/3.2

参考答案：B

【莽学解析】

$$d_1 = \frac{ln\frac{S}{K} + (r + \frac{1}{2}\sigma^2)T}{\sigma\sqrt{T}} = \frac{ln\frac{50}{50} + (0.03 + \frac{1}{2}0.22^2) \times 0.75}{0.22 \times \sqrt{0.75}} = 0.213$$

$$d_2=\frac{ln\frac{50}{50}+(0.03-\frac{1}{2}0.22^2)\times 0.75}{0.22\times\sqrt{0.75}}=0.0228$$

=SN(1)-rT)dput=Keˆ(-rT)N(-d2)-SON(-d1)=3.2

146.The domestic U.S. (USD) risk-free interest rate is 1.0% per annum and the foreign Eurozone (EUR) risk-free interest rate is 2.0% per annum. The EUR/USD exchange rate has a volatility of 28%. We want to value a US dollar-denominated European-style currency call option on the Euro with a one-year term to expiration. Our binomial model uses a four-step tree, such that each step is three months. What is the risk-neutral probability of an up movement （ ）?

A.0.456

B.0.497

C.0.508

D.0.584

参考答案：A

【莽学解析】

$p = (a - d)/(u - d)$, and we treat the foreign interest rate like a dividend such that:

$a = e^{(\text{domestic rate}-\text{foreign rate})\Delta t} = e^{(1\%-2\%)\times 0.25} = 0.997503$;

$u = e^{\sigma\sqrt{\Delta t}} = e^{28\%\sqrt{0.25}} = 1.150$

$d = 1/u = 0.869$

$p = (0.997503 - 0.869)/(1.150 - 0.869) = 0.4562$

147.According to the Black-Scholes-Merton model for evaluating European options on non-dividend paying stock, which option sensitivity (Greek) would be identical for both a call and a put option, given that the implied volatility, time to maturity, strike price, and risk free interest rate were the same? I. Gamma II. Vega III Theta IV Rho

A.II only

B.I and II

C.All the above

D.III and IV

参考答案：B

【莽学解析】Gamma and vega are identical for calls and puts with the same strike price and time to expiration.Gamma和vega在看涨期权和看跌期权方面具有相同的执行价格和到期时间。

148.Which position is most risky?

A.Gamma-negative, delta-neutral

B.Gamma-positive, delta-positive

C. Gamma-negative, delta-positive
D. Gamma-positive, delta-neutral
参考答案：C
【莽学解析】A riskier position is one that is expected to move around a lot in value. A delta neutral position should not change in value as the value of the underlying asset changes. This eliminates Choice A and Choice D. Choice C is correct because a gamma-negative position means that delta and the change in the underlying asset move inversely with each other.风险较高的头寸可能会变动很多。 随着基础资产价值的变化，中立三角洲头寸的价值不应发生变化。 这样就消除了选择A和选择D。选择C是正确的，因为gamma为负的位置意味着增量和基础资产的变化彼此相反。

149. A stock currently trades at $10. At the end of three months, the stock will either be $11 or $9. The continuously compounded risk-free rate of interest is 3.5% per year. The value of a 3-month European call option with a strike price of $10 is closest to:
A. $0.11
B. $0.54
C. $0.65
D. $1.01
参考答案：B
【莽学解析】

$$u = 11/10 = 1.1$$

$$d = 9/10 = 0.9$$

$$P_{up} = \frac{e^{r\Delta t} - d}{u - d} = \frac{e^{3.5\% \times 0.25} - 0.9}{1.1 - 0.9} = 54.39\%$$

The value of the option today is therefore $(11 - 10) \times 54.39\% \times e^{-3.5\% \times 0.25} = 0.54$

150. Which of the following is not an assumption of the Black-Scholes options pricing model?
A. The price of the underlying moves in a continuous fashion.
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】The BSM model assumes:The price of the underlying asset moves in a continuous fashion.Interest rates are known and constant.Variance of returns is constant.Perfect liquidity and transaction capabilities.BSM模型假定：标的资产的价格以连续的方式变动。利率是已知且恒定的。收益差异是恒定的。完美的流动性和交易能力

151. A stock with a current price of $32 and volatility of 15% pays a dividend of 2.0% per annum (with continuous compounding). The riskless rate is 2.0%. We use a twelve-step binomial model to price an American put option with one year to expiration; i.e., each step is one month. What is the risk-neutral probability of a down movement (1-p)?
A. 0.4646

B.0.4962
C.0.5108
D.0.5375
参考答案：C
【莽学解析】

$$a = e^{(r-q)\Delta t} = e^{(2\%-2\%)\times 1/12} = 1.0$$
$$u = e^{\sigma\sqrt{\Delta t}} = e^{15\%\sqrt{1/12}} = 1.044,\ d = 0.958$$
$$p = (a-d)/(u-d) = (1.0-0.958)/(1.044-0.958) = 0.4892;$$
$$1-p = 0.51082$$

152.For purposes of option valuation, how is "dividend" defined?
A.The increase in the stock price on the ex-dividend date arising from any dividends declared
B.The reduction in the stock price on the ex-dividend date arising from any dividends declared
C.The increase in the stock price on the declaration date arising from any dividends declared
D.The reduction in the stock price on the declaration date arising from any dividends declared
参考答案：B
【莽学解析】The reduction in the stock price on the ex-dividend date arising from any dividends declared因宣布的股息而导致的除息日股票价格的降低。

153.A market maker is trading the following three (3) positions in call and put options which are identical with respect to their underlying stock price, the strike price and the maturities: long 100 ATM call options with a percentage delta of 0.6; short 60 ATM call options; and long 50 ATM put options. Which trade will neutralize the market maker's delta?
A.Buy 6.0 shares
B.Sell 6.0 shares
C.Buy 4.0 shares
D.Sell 4.0 shares
参考答案：D
【莽学解析】First call position delta = +100 long quantity × 0.6 = +60 position delta;Second call position delta = -60 short quantity × 0.6 = -36 position delta;Put position delta = +50 long quantity × -0.4 percentage delta = - 20 position delta; i.e., put delta = N(1) - 1 = call delta - 1 = 0.6 - 1Total position delta = +60 - 36 - 20 = +4, such that short 4 shares will neutralize delta.第一个看涨期权的delta= 100 × 0.6 = 60 头寸 delta第二个看涨期权的delta = -60 short quantity × 0.6 = -36 delta;看跌期权的delta= 50× -0.4 percentage delta = - 20 delta看跌期权的delta= N(1) - 1 = call delta - 1 = 0.6 - 1总delta 60 - 36 - 20 = 4, 那么卖 4 个股票可以达到delta中性。

154.A six-month European put option on a non-dividend-paying stock has a strike price of $100 when the current stock price is $100. The risk free rate is 4%. N(d1) = 0.57 and N(d2) = 0.48. What is the Black-Scholes price of the put option?
A.-$9.95
B.$6.96

C.$7.97
D.$8.33
参考答案：C
【莽学解析】N(-d_1)=1-N(d_1)=1-0.57=0.43;N(-d_2)=1-N(d_2)=1-0.48=0.52.put=Keˆ(-rT) N(-d_2)-S_0 N(-d_1)= $7.97N(－d_1)=1－N(d_1)=1－0.57=0.43;N(－d_2)=1－N(d_2)=1－0.48=0.52.put=Keˆ(－rT) N(－d_2)－S_0 N(－d_1)= $7.97

155.A portfolio has the following position Greeks: delta = -300, gamma = -150, and vega = -3,000. A trader wants to neutralize all three Greeks and, in addition to the underlying shares, can use the following two options: Call option with the following percentage Greeks: delta = 0.60, gamma = 0.20, and vega = 10.0 Put option with the following percentage Greeks: delta = -0.40, gamma = 0.30, and vega = 20.0 Along with the underling shares, which set of trades will make the total position delta-gamma-vega neutral?
A.Short 800 of the calls; long 150 of the puts, and short 500 of the underlying shares
B.Short 1,500 of the calls; short 680 of the puts, and long 770 of the underlying shares
C.Long 2,100 of the calls; short 900 of the puts; and short 1,320 of the underlying shares
D.Long 3,000 of the calls; short 1,750 of the puts; and long 540 of the underlying shares
参考答案：C
【莽学解析】Let x = number of call options and y = number of put options. Gamma and vega neutrality are implied by:Gamma neutral: -150 + 0.20x + 0.30y=0 -->0.20x + 0.30y = 150, andVega neutrals: -3,000 + 10x + 20y = 0 --> 10x + 20y = 3,000.This is two equations and two unknowns such that x = 2,100 and y = -900.The delta of this gamma-vega neutral portfolio = -300 + 2100×0.60 - 900×(-0.40) = 1,320 such that short 1,320 will neutralize delta. 设x =看涨期权数量，y =看跌期权数量。若满足gamma中性和vega中性：Gamma neutral: －150 ＋0.20x ＋0.30y=0 0.20x＋0.30y = 150, Vega neutrals: －3,000＋10x ＋20y = 0 10x＋20y = 3,000.可以得到x=2100，y=-900这个gamma和vega中性的资产组合的delta为= －300 2100×0.60 －900×(－0.40) = 1,320。则再卖1320份股票达到delta中性

156.Suppose an existing short option position is delta-neutral, but has a gamma of negative 600. Also assume that there exists a traded option with a delta of 0.75 and a gamma of 1.50. In order to maintain the position gamma-neutral and delta-neutral, which of the following is the appropriate strategy?
A.Buy 400 options and sell 300 shares of the underlying asset.
B.Buy 300 options and sell 400 shares of the underlying asset.
C.Sell 400 options and buy 300 shares of the underlying asset.
D.Sell 300 options and buy 400 shares of the underlying asset.
参考答案：A
【莽学解析】To gamma-hedge, we should buy 400 options (600/1.50). The additional options will alter delta, and to maintain delta-hedged position again, we should sell 300 shares (400×0.75) of the underlying position.要进行gamma对冲，我们应该购买400个期权（600 / 1.50）。 额外的期权将改变Delta，并再次保持delta套期保值头寸，我们应出售300股基础头寸（400×0.75）。

157.Consider a non-dividend paying stock currently priced at $37. Assuming that the price of the stock will rise or fall by 5% every three months. The continuously compounded risk free rate is 7%. Calculate the value of a 6-month European call option with a strike price at $38.
A.$1.065

B. $1.234
C. $1.856
D. $2.710
参考答案：B
【莽学解析】
The value of the call option is the present value of the expected intrinsic value. The probability of an up move is:

$$p = \frac{e^{rt} - d}{u - d} = \frac{e^{7\% \times 0.25} - 0.95}{1.05 - 0.95} = 0.67654$$

The only path along which the option finishes in the money is two upward moves, which has a probability of occurring of $0.67654^2 = 0.45771$. The value of the option today is therefore: $C = 0.45771 \times 2.7925 \times e^{-7\% \times 0.5} = 1.234$.

158. A trader buys an at-the-money call option with the intention of delta-hedging it to maturity. Which one of the following is likely to be the most profitable over the life of the option?
A. An increase in implied volatility.
B. The underlying price steadily rising over the life of the option.
C. The underlying price steadily decreasing over the life of the option.
D. The underlying price drifting back and forth around the strike over the life of the option.
参考答案：D
【莽学解析】There are two important factors in this situation: The option is at the money, and the trader intends to delta-hedge it to maturity. The fact that the option is at the money means that the delta is most sensitive to changes in the price of the underlying asset. Movement away from the current price would create the need to re-hedge and increase costs. Since the position will be hedged, the ultimate value of the underlying asset will not affect the profitability of the position.在这种情况下，有两个重要因素：期权是价内的，交易者打算将其对冲至到期。 期权是平价的意味着，增量对基础资产价格的变化最为敏感。 偏离当前价格将产生重新套期保值和增加成本的需求。 由于头寸将被套期，因此基础资产的最终价值不会影响头寸的获利能力。

159. If it is necessary to be long 2,500 deep-in-the-money call options in order to create a gamma neutral position, which of the following actions would best restore the original delta-neutral position after the addition of the options?
A. Sell 1,250 shares of the underlying asset
B. Buy 1,250 shares of the underlying asset
C. Sell 2,500 shares of the underlying asset
D. Buy 2,500 shares of the underlying asset
参考答案：C
【莽学解析】The delta of a call option that is deep in-the-money is close to 1. The addition of the 2,500 long options to bring about gamma neutrality disturbed the original delta neutral position of the portfolio. Since 2,500 options have been added, 2,500×1.0=2,500 shares of the underlying must be sold to restore delta neutrality to the portfolio. Note that answer A could

be correct only if the options were at-the-money where delta is 0.5.价内期权深度比较大的看涨期权的价格接近1。2,500张长期期权的加价带来了gamma中性，这扰乱了投资组合的原始delta中立地位。 由于添加了2,500份期权，必须出售2,500×1.0 = 2,500股基础股票才能恢复投资组合的中立性。 请注意，答案A仅在选项为平价（delta为0.5）的情况下才是正确的。

160.A portfolio of stock A and options on stock A is currently delta neutral, but has a positive gamma. Which of the following actions will make the portfolio both delta and gamma neutral?

A.Buy call options on stock A and sell stock A

B.Sell call options on stock A and sell stock A

C.Buy put options on stock A and buy stock A

D.Sell put options on stock A and sell stock A

参考答案：D

【莽学解析】To reduce positive gamma, one needs to sell options. When call options are sold, the delta becomes negative and one needs to buy stock to keep delta neutrality. When put options are sold, the delta becomes positive, and one needs to sell stock to keep delta neutrality.为了减少正gamma，人们需要出售期权。 卖出看涨期权时，差价变为负数，因此需要购买股票以保持差价中立。 卖出认沽期权时，Delta变为正值，因此需要出售股票以保持Delta中立。

161.A European put option on a non-dividend paying stock has a remaining life of 6 months with a strike of USD 50 and the risk-free rate of 1%, after 3 months which of the following stock prices has the highest time-value of the option (in% of stock price)?

A.USD 10

B.USD 40

C.USD 50

D.USD 60

参考答案：C

【莽学解析】The at-the-money option has the highest time value, given its highest theta.给定价位的theta值最高，因此平价期权的时间值最高。

162.Mr. Black has been asked by a client to write a large put option on the S&P 500 index. The option has an exercise price and a maturity that is not available for options traded on exchanges. He, therefore, has to hedge the position dynamically. Which of the following statements about the risk of his position are not correct?

A.He can make his portfolio delta neutral by shorting index futures contracts.

B.There is a short position in an S&P 500 futures contract that will make his portfolio insensitive to both small and large moves in the S&P 500.

C.A long position in a traded option on the S&P 500 will help hedge the volatility risk of the option he has written.

D.To make his hedged portfolio gamma neutral, he needs to take positions in options as well as futures.

参考答案：B

【莽学解析】The short index futures make the portfolio delta neutral. It does not help with large moves, though.空头指数期货使投资组合的delta中性。 但是对于大幅异动并没有什么帮助。

163.In evaluating the dynamic delta hedging of a portfolio of short option position, which of

the following is correct?

A. The interest cost of carrying the delta hedge will be highest when the options are deep out-of-the-money.

B. The interest cost of carrying the delta hedge will be highest when the options are deep in-the-money.

C. The interest cost of carrying the delta hedge will be lowest when the options are at-the-money.

D. The interest cost of carrying the delta hedge will be highest when the options are at-the-money.

参考答案：B

【莽学解析】The deeper into-the-money the options are, the larger their deltas and therefore the more expensive to delta hedge.期权越实值，其delta值越大，因此delta套期保值价格就越高。

164. A delta-neutral option portfolio has a position gamma of +300. If call options have a (percentage) delta of 0.58 and gamma of 0.120, what trades will neutralize the delta and gamma of the portfolio?

A. Long 1,500 put options and sell 950 shares

B. Short 1,500 put options and buy 950 shares

C. Long 2,500 call options and sell 1,450 shares

D. Short 2,500 call options and buy 1,450 shares

参考答案：D

【莽学解析】To neutralize position gamma of +300, short 300/0.12 = 2,500 call options; i.e.,-2,500×0.12=- 300.But this creates -2,500 × 0.58 = -1,450 position delta, so buy 1,450 shares.为了使投资组合的gamma 300达到gamma中性， 卖出300/0.12=2,500的看涨期权但就会产生-2,500 × 0.58 = -1,450delta， 则买入1450份股票。

165. The current price of a non-dividend paying stock is $75. The annual volatility of the stock is 18.25%, and the current continuously compounded risk-free interest rate is 5%. A 3-year European call option exists that has a strike price of $90. Assuming that the price of the stock will rise or fall by a proportional amount each year, and that the probability that the stock will rise in any one year is 60%, what is the value of the European call option?

A. $22.16

B. $12.91

C. $3.24

D. $7.36

参考答案：D

【莽学解析】

166. A trader has an American put option with strike price of $50. The underlying asset is stock with a spot price of $40. Using an one-step binomial tree to evaluate the option. Suppose the stock price will go up or down by $8 in 6 month, the risk-free rate is 6.2%, what is the value of this American put?

A. USD 8.19

B. USD 8.45

C. USD 10.00

$u = e^{\sigma\sqrt{t}} = e^{18.25\%\times\sqrt{1}} = 1.2$

$d = 1/u = 1/1.2 = 0.83$

Next, we project the various paths the stock's price can follow over the 3 year period. T

stock has 4 potential ending values:

$S_{uuu} = \$75 \times 1.2 \times 1.2 \times 1.2 = \$129.60$

$S_{uud} = S_{duu} = S_{udu} = \$75 \times 1.2 \times 1.2 \times 0.83 = \$89.64$

$S_{udd} = S_{dud} = S_{ddu} = \$75 \times 1.2 \times 0.83 \times 0.83 = \$62.00$

$S_{ddd} = \$75 \times 0.83 \times 0.83 \times 0.83 = \$42.89$

The only point at which the option finishes in the money is after 3 upward moves, wit

probability of $60\%^3 = 21.6\%$.

The value of the option today is therefore $(129.60-90)\times 21.6\% \times e^{-5\%\times 3} = 7.36$.

D. USD 10.32

参考答案：C

【莽学解析】

$u = 48/40 = 1.2$

$d = 32/40 = 0.8$

$P_{up} = \dfrac{e^{r\Delta t} - d}{u - d} = \dfrac{e^{6.2\%\times 0.5} - 0.8}{1.2 - 0.8} = 57.87\%$

$f = [(50-48)\times 0.5787 + (50-32)\times(1-0.5787)]\times e^{-6.2\%\times 0.5} = 8.47$

Early Exercise, therefore, the value of this American put is 10.

167. Portfolio manager Sally has a position in 100 option contracts with the following position greeks: theta=+25,000; vega=+330,000 and gamma=-200; ie., positive theta, positive vega and negative gamma. Which of the following additional trades, utilizing generally at-the-money(ATM) options, will neutralize(hedge) the portfolio with respect to theta, vega and gamma?

A. Sell short-term options + sell long-term options (all roughly at-the-money)

B. Sell short-term options + buy long-term options (~ ATM)

C. Buy short-term options + sell long-term options (~ ATM)

D. Buy short-term options + buy long-term options (~ ATM)

参考答案：C

【莽学解析】For ATM options, vega and theta are increasing funtions with maturity;and ganma is a decreasing function with matutity. To buy short-term options + sell long-term options → negative position thera, negative position vega, and positive position gamma. In regard to

(A), sell short-term + sell long-term options → positive thera, negative vega; negative gamma. In regard to (B), sell short-term + buy long-term options → positive thera, positive vega; and negative gamma. In regard to (D), buy short-term + buy long-term → negative thera, positive vega; and positive gamma. 对于ATM选项，vega和theta随着功能的成熟而增加；而gamma随着功能的成熟而减少。买入短期期权 卖出长期期权→负头寸theta，负头vega和正头gamma。关于（A），卖出短期 卖出长期期权→正头寸theta，负vega； 负gamma。关于（B），卖出短期 买入长期期权→正头寸theta，正vega； 和负gamma。关于（D），买入短期 买入长期→负头寸theta，正vega； 和正gamma。

168. What is the reason for undertaking a vega hedging? To minimize the:
A. possibility of counterparty default risk.
B. potential loss as a result of a change in the volatility of the underlying source of risk.
C. adverse effect due to the government regulation.
D. potential loss as a result of a large movement in the underlying source of risk.
参考答案：B
【莽学解析】Vega describes the rate of change of the value of a portfolio with respect to the volatility of the underlying asset. Vega描述了资产组合价值相对于基础资产波动率的变化率。

169. The current price of a stock is $10, and it is known that at the end of three (3) months the stock's price will be either $13 or $7. The risk-free rate is 4% per annum. What is the implied no arbitrage price of a three-month (T = 0.25) European call option on the stock with a strike price of $10? (Note: this does not include an assumption about the stock's volatility).
A. $0.97
B. $1.28
C. $1.53
D. $1.65
参考答案：C
【莽学解析】

Following Hull, a riskless portfolio consists of long delta (d) shares + short one option.

- If the stock moves up, value of the riskless portfolio = $13 × delta − $3
- If the stock moves down, value of the riskless portfolio = $7 × delta.
- Setting them equal (i.e., riskless payoff): $13 × d − $3 = $7 × d, and 6d = 3, so d = 0.5.

If delta (d) = 0.5, then value of portfolio today is: $10 × 0.5 − f = 5 − f = $3.5 × $e^{-1\%}$ such that f = $1.53483

Notationally,

- u = 13/10 = 1.3; d = 7/10 = 0.7
- $p = \frac{e^{r\times\Delta t}-d}{u-d} = 0.51675$
- f = $1.53483

170.Consider a convertible bond that is trading at a conversion premium of 20 percent. If the value of the underlying stock rises by 25 percent, the value of the bond will:
A.Rise by less than 25%
B.Rise by 25%
C.Rise by more than 25%
D.Remain unchanged
参考答案：A
【莽学解析】The convertible bond implicitly gives bondholders a call option on the underlying stock. The delta of this option will vary between 0 (when the option is extremely out of the money) and 1 (when the option is extremely in the money). In this case, the bond is trading at a conversion premium of 20% so the delta must be somewhere between zero and one, and hence the price of the convertible bond will rise by less than the price of the underlying stock.可转换债券隐含地给予债券持有人相关股票的看涨期权。这个期权的增量将在0(当期权深度虚值)和1(当期权深度实值)之间变化。在这种情况下，该债券的转换溢价为20%，因此delta必须介于0和1之间，因此可转换债券的价格涨幅将小于标的股票的价格涨幅。

171.Which of the following statements is correct about the early exercise of American options?
A.It is always optimal to exercise an American call option on a non-dividend-paying stock before the expiration date.
B.It can be optimal to exercise an American put option on a non-dividend-paying stock early.
C.It can be optimal to exercise an American call option on a non-dividend-paying stock early.
D.It is never optimal to exercise an American put option on a non-dividend-paying stock before the expiration date.
参考答案：B
【莽学解析】It is never optimal to exercise an American call option on a non-dividend-paying stock before the expiration date, but at any given time during its life, a put option should always be exercised early if it is sufficiently deep in the money. Thus, it can be optimal to exercise an American put option on a non-dividend-paying stock early.在到期日之前行使非派息股票的美式看涨期权从来都不是最佳选择，但在期权到期期间的任何一个特定时间，如果看跌期权的资金足够雄厚，就应该尽早行使。因此，尽早行使非派息股票的美国看跌期权可能是最优的。

172.The spot EUR/USD exchange rate is $1.30 (i.e., USD 1.30 per 1 EUR) with a volatility of 30% per annum. The USD riskless rate is 4% per annum and the EUR riskless rate is 3% per annum. What is the delta of a one-year call option on the Euro with a strike price of EUR/USD $1.36?
A.0.4980
B.0.5131
C.0.5529
D.0.6078
参考答案：A
【莽学解析】
我们用外国无风险利率代替股息收益率：d_1=ln〖(S_0/K) (r ＋σ^2/2)T〗/(σ √T)， 则 d_1= 0.0329，N(d_1) = 0.5131,。再次用国外无风险利率代替股息收益率：看跌期权的delta= N(d_1) e^(－qT)= 0.4980

173.In the absence of dividends, Hull shows that an American-style call option should never be

We substitute the foreign risk-free rate for the dividend yield:

$d_1 = \frac{\ln(S_0/K)+\left(r+\frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$, so that: $d_1 = 0.0329$, and $N(d_1) = 0.5131$, and again substitute the foreign riskfree rate for the dividend yield:

delta of call = $N(d_1)\, e^{-qT} = 0.4980$

exercised early. However, if the American-style call option instead does pay dividends, which of the following is TRUE?

A. It is still never optimal to early exercise an American call option

B. It may be optimal to early exercise an American call option immediately after the ex-dividend date

C. It may be optimal to early exercise an American call option immediately before the ex-dividend date

D. It is always optimal to early exercise an American call option immediately before the ex-dividend date

参考答案：C

【莽学解析】It may be optimal if the dividend is large, but it will only be optimal immediately before the ex-dividend date.(Note: the ex-dividend date is the first date following the declaration of a dividend on which the buyer of a stock is not entitled to receive the next dividend payment) 它可能是最佳如果股息很大,但这只会是最佳立即除息前的日期。

174. If risk is defined as a potential for unexpected loss, which factors contribute to the risk of a short call option position?

A. Delta, Vega, Rho

B. Vega, Rho

C. Delta, Vega, Gamma, Rho

D. Delta, Vega, Gamma, Theta, Rho

参考答案：C

【莽学解析】For a short call, Delta Vega, Gamma, and Rho contribute to the risk of the position. Theta is not a risk factor.对于一个卖出看涨期权，Delta Vega, Gamma，和Rho对头寸的风险有贡献。Theta不是一个风险因子。

175. Which type of option experiences accelerating time decay as expiration approaches in an unchanged market?

A. In-the-money

B. Out-of-the-money

C. At-the-money

D. None of the above

参考答案：C

【莽学解析】The theta of the option (time value) decays at a higher rate as expiration approaches for at-the-money options.随着平价期权到期日的临近，期权的theta（时间值）以更高的速率衰减。

176. Which of the following IBM options has the highest gamma with the current market price of

IBM common stock at USD 68?
A.Call option expiring in 10 days with strike USD 70
B.Call option expiring in 10 days with strike USD 50
C.Put option expiring in 10 days with strike USD 50
D.Put option expiring in 2 months with strike USD 70
参考答案：A
【莽学解析】Gamma is highest for at the money options nearing expiration. The at-the-money options are those with a strike of 70. The shortest dated options are the 10 day options. Thus, A is correct.在即将到期的货币期权中，Gamma最高。 平价期权是那些行使价为70的期权。期限最短的期权是10天期权。 因此，A是正确的。

177.A market maker writes 100 at-the-money call option contracts and delta hedges dynamically by daily rebalancing of a long position in the underlying shares. The delta hedge is based on an implied volatility assumption of approximately 10% per annum. However, at the end of the month, the realized (actual subsequent) volatility of the stock was over 20%. However, the stock fluctuated both up and down roughly evenly. If borrowing occurs at the constant risk-free rate, and transaction costs are ignored, what is the net profit (loss) to the market maker at the end of the month?
A.Net loss due to gamma exposure
B.Net loss due to theta (time decay)
C.Approximately break-even due to the almost continuous delta hedge and roughly even up\/down movements
D.Net gain due to the gamma exposure
参考答案：A
【莽学解析】If the realized volatility matched the assumed volatility (which informs the delta!), then the market maker should be roughly break-even due to the delta-hedge; this is another way of viewing Hull's statement that the discounted cost of hedging should roughly equal the Black- Scholes price.However, the market marker, who is short options, remains "short gamma" (aka, "long short convexity"); i.e., the long shares have per share delta of 1.0 but gamma of zero (do you see why? the delta of 1.0 does not vary). The market maker's option counterparty, on the other hand, is "long gamma."In this case, a realized volatility higher than assumed implies losses to the short gamma position.In regard to (B), while time decay has a second-order impact on gamma (i.e., for ATM options, gamma increases as time to maturity decreases; so this effect only compounds the short gamma), the shorter maturity is already re-computed in each daily re-balancing.如果实现的波动率与假设的波动率相匹配（已知delta），则做市商应因delta对冲而大致达到收支平衡。 这是查看Hull关于对冲折现成本应大致等于BSM价格的说法的另一种方式。然而，做市商卖出期权，仍然是空头gamma；也就是说多头股票的差额为1.0，但是gamma为0. 另一方面，做市商的对手方的期权是多头gamma

178.Which of the following Greeks contributes most to the risk of an option that is close to expiration and deep in the money?
A.Vega
B.Rho
C.Gamma
D.Delta
参考答案：D

【莽学解析】Delta measures the change in an option's price as the price of the underlying asset changes. An option that has high intrinsic value and a short time to maturity will have a delta close to one, and a gamma, rho and vega all close to zero.Delta会随着基础资产价格的变化来衡量期权价格的变化。 具有高内在价值和较短到期时间的期权的delta值将接近于1，而gamma，rho和vega都将接近于零。

179.What is the risk-neutral probability of an up movement （ ） in a two-step binomial model used to value an two-year American-style put option on a stock with a volatility of 38% when the risk-free rate is 4.0%; i.e., each step is one year?

A.0.411

B.0.459

C.0.503

D.0.548

参考答案：B

【莽学解析】

$$u = 1.462 \quad d = 0.684$$

$$p = \frac{e^{r\times\Delta t} - d}{u - d} = (1.040811 - 0.684)/(1.462 - 0.684) = 0.4586$$

180.Hull (equation 17.4) shows that the relationship between theta, delta and gamma is given by: theta + (Rf × S × delta) + (0.5×variance(S)×S^2×gamma) = Rf×Value(option portfolio), where (Rf) is the risk-free rate and (S) is the stock price. The price of a one-year European call option with a strike price of $100 is $13.75 when the stock price is also $100. The volatility is 30.0% and the risk-free (Rf) rate is 4.0% per annum. The option's (percentage) delta is 0.612 and gamma is 0.0128. What is the option's theta?

A.-5.333

B.-7.658

C.-9.112

D.-11.115

参考答案：B

【莽学解析】

Just apply the equality, solving for theta

$$rf = theta + rS_0 \times delta + \frac{1}{2}\sigma^2 S_0^{\,2} \times gamma$$

$$theta = 4\% \times 13.75 - (4\% \times 100 \times 0.612) - (0.5 \times 30\%^2 \times 100^2 \times 0.0128) = -7.658$$

应用等式，在算出theta rf=theta+rS_0×delta+1/2 σ^2 〖S_0〗^2×gamma theta=4%×13.75 −(4%×100×0.612) − (0.5×〖30%〗^2×〖100〗^2×0.0128)=−7.658

181.Patricia has a short position in 100 put option contracts where the per-option (aka, percentage) vega is 33.50 and the stock's volatility is 30.0% per annum. The value of each

option is $8.77 and each contract is for 100 options. If the volatility jumps by +5.0% to 35.0%, which is nearest to the estimated change in her position's value?

A. Loss of $16,750.00

B. Loss of $4,385.00

C. Loss of $1,469.00

D. Gain of $4,385.00

参考答案：A

【莽学解析】A vega of 33.50 implies the value of the option will increase (as a linear approximation only!) by $33.50 per one unit increase in volatility, where one unit is 100%. Therefore a 5.0% increase in volatility implies a change of 5.0% × 33.5 = $1.6750 but given Patricia has a short position in 100 contracts, her estimated LOSS is 5% × 33.50 × -10,000 = -$16,750.33.50的vega表示期权的价值每增加1个单位为100%的波动率，将增加33.50美元（仅作为线性近似！）。 因此，波动率增加5.0%意味着5.0% × 33.5 = $1.6750，但鉴于Patricia在100张合约中有空头头寸，她的估计亏损为5% × 33.50 × -10,000 = -$16,750。

182. A one-year European call option has a strike price of $10. The risk-free rate is 4% per annum. What is an estimate of the call price if the stock is $30; i.e., significantly in-the-money?

A. $18.80

B. $20.00

C. $20.39

D. $21.22

参考答案：C

【莽学解析】As the stock price becomes large relative to the strike price, N(d_1) and N(d_2) approach 1.0; in this case, they are 1.000 and 0.9999. In which case, call=S_0 N(d_1)-Keˆ(-rT) N(d_2) is approximated by: c = S- K×exp(-rT). In this case, c = 30-10eˆ(-4%×1)=$20.3921 (the precise value is $20.3922). Please note that, also, as the volatility (sigma) approaches zero, the Black-Scholes similarly approaches the minimum value: S_0-Keˆ(-rT).当股票价格和执行价格有很大的关联，N(d_1) 和 N(d_2)接近1/0.那么它们分别为1.000 and 0.9999。根据公式call=S_0 N(d_1)－Keˆ(－rT) N(d_2)，则 c = 30?10eˆ(－4%×1)=$20.3921请注意，当波动率(sigma)趋近于零时，BSM也会趋近于最小值S_0－Keˆ(－rT)。

183. Which of the following statements is true regarding options Greeks?

A. Theta tends to be large and positive when buying at-the-money options.

B. Gamma is greatest for in-the-money options with long maturities.

C. Vega is greatest for at-the-money options with long maturities.

D. Delta of deep in-the-money put options tends toward +1.

参考答案：C

【莽学解析】Theta is negative for long positions in ATM options, so A is incorrect. Gamma is small for ITM options, so B is incorrect. Delta of ITM puts tens to -1, so D is incorrect.对于ATM期权多头，Theta为负值，因此A是不正确的。对于ITM选项来说，Gamma很小，因此B是不正确的。ITM put趋向于-1，所以D是不正确的。

184. Patty and Peter are risk analysts who are attempting to utilize the Black-Scholes-Merton option pricing model (BSM OPM) in order to price a call option on a publicly-traded stock. Their BSM OPM is a simple Excel model; of course they can modify inputs and perform

calculations, but they are not prepared to make sophisticated adjustments to the model. Consider the following five issues: I. The both agree that the stock's volatility is not constant II. They both believe that continuously compounded returns on the stock exhibit leptokurtosis; i.e., are heavy-tailed III. They disagree on the stock's expected return: Patty believes E[return] is only +8.0% but Peter believes E[return] is at least +13.0% IV. The stock pays a dividend and they agree on the forecast, but the dividend assumption consists of multiple, quarterly (aka, lumpy) dollar payouts rather than a continuous dividend yield assumption V. They both agree that the stock will pay a continuous dividend yield of 5.0%, but the call option is an American style option (and they do require a convenient analytical solution per their simple Excel model) Which of the issues above creates a genuine theoretical problem that cannot be easily addressed such that their basic BSM model's output will not be highly dependable?

A.None of these are real problems (each is easily addressed by the basic BSM OPM)

B.Only III. and IV. are real problems

C.Only I., II., and V. are real problems

D.All of these are real problems (none can be easily addressed by the basic BSM OPM)

参考答案：C

【莽学解析】They both agree that the stock's volatility is not constant: this is a real problem because the BSM assumes constant volatility and volatility is a critical input, unlike say the risk-free input. If the risk-free rate is stochastic, we are not as concerned They both believe that continuously compounded returns on the stock exhibit leptokurtosis; i.e., are heavy-tailed: this is a real problem because the critical assumption is that log returns exhibit a normal distribution; aka, prices exhibit a lognormal distribution. They disagree on the stock's expected return: Patty believes E[return] is only 8.0% but Peter believes E[return] is at least 13.0%: this is irrelevant because the model does not make an assumption about the stock's expected return The stock pays a dividend and they agree on the forecast, but the dividend assumption consists of multiple, quarterly (aka, lumpy) dollar payouts rather than a continuous dividend yield assumption: this is not even a problem, as the model easily handle dividends of either sort. In fact, lumpy dividend can be translated into their continuous equivalent. They both agree that the stock will pay a continuous dividend yield of 5.0%, but the call option is an American style option and they do require a convenient analytical Merton-like solution per their Excel model: this is a real problem because the adjustment requires more advanced numerical solutions 股票的波动率不是恒定的:这是一个真实的问题，因为BSM假设波动率是恒定的，而波动率是一个关键的输入，不像无风险的输入。如果无风险利率是随机的，我们就不那么担心了。股票支付红利和他们达成一致预测,但假设股息由多个季度(aka,块状)美元支出而不是一个连续的股息收益率假设:这不是一个问题,因为该模型容易处理的股息。事实上，波动股利可以转换成它们的连续等价物。他们都一致认为,股票将付出持续的股息收益率为5.0%,但看涨期权是一个美式期权,他们需要一个方便的分析Merton-like解决方案/Excel模型:这是一个真正的问题,因为调整需要更先进的数值解。

185.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 increases 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】Vega is an option's sensitivity to changes in volatility of the underlying stock. vega is close to zero for deep in- or deep out-of-the-money puts and calls. Rho is an option's sensitivity to changes in interest rates and tends to be the highest for in-the-money calls and puts. Increases in rates will cause larger increases for in-the-money calls, but larger decreases for in-the-money puts. Given this info, choice b will work because it is a deep in-the-money call, and choice c will not work because it is a short position in an at-the-money put. Choice a will not work because it is an at-the-money call (which would be highly sensitive to vega). And choice d will not work because rising rates will have little impact on the position since it is an out-of-the-money put.Vega是期权对基础股票波动性变化的敏感性。 对于deep平价或价外的看跌期权和看涨期权，vega几乎为零。 Rho是期权对利率变化的敏感度，通常对于货币内看涨和看跌期权而言是最高的。 费率的提高将导致货币内看涨期权的增加幅度更大，但货币内看跌期权的下降幅度更大。 给定此信息，选择b将起作用，因为它是一个价内看跌期权，而选择c将不起作用，因为它是平价看跌期权中的空头头寸。 选择a无效，因为它是平价通话（对vega高度敏感）。 选择d将不起作用，因为升息率对价位的影响很小，因为这是一笔超值的认沽权。

186.A market maker writes (sells) a contract of 100 call options, where the percentage (per option) delta of the call options is 0.60 and the gamma is 0.080. The market maker wants to neutralize both the delta and gamma of this position (delta-gamma-neutral) with two additional trades: the underlying shares; and put options on the stock with percentage delta of -0.40 and gamma of 0.020. What are the trades?

A.Buy 200 put options and buy 80 shares

B.Sell 200 put options and sell 80 shares

C.Buy 400 put options and buy 220 shares

D.Sell 400 put options and sell 220 shares

参考答案：C

【莽学解析】The written options have position delta = -100 × 0.60 = -60.0; and position gamma of -100 × 0.080 = -8.0.The puts must be used to neutralize the position (as the shares have zero gamma).As 8.0/0.020 = 400, 400 put options must be purchased to neutralize gamma: +400 × 0.020 = +8.0 which neutralizes the -8.0.But the long 400 put options reduced (added negative) position delta = +400×-0.40=-160.0such that the cumulative position delta = -60.0 +-160.0 = -220.0.Therefore, the market maker must purchase 220 shares (with +1.0 delta each) to neutralize delta.To summarize, the final position:Delta=(-100× 0.60)+(+400×-0.40)+(220×1.0)=0; andGamma=(-100×0.080)+(+400×0.020)+(220×0)=0.为了使投资组合的gamma 300达到gamma中性， 卖出300/0.12=2,500的看涨期权 卖出期权的delta= -100 × 0.60 = -60.0；gamma为-100 × 0.080 = -8.0.看跌期权被认为要达到中性。8.0/0.020 = 400, 买入400份看跌期权可以达到gamma中性 400 × 0.020 = 8.0（与-8.0中和）。但是买入400份看跌期权减少了delta= 400×－0.40=－160.0现在累计的delta= －60.0＋160.0 = －220.0.因此做市商需要都卖220份股票来达到delta中性，此时的delta和gamma都为0.

187.Which of the following statements about option time value is true?

A.Deeply out-of-the-money options have more time value than at-the-money options with the same remaining time to expiration.

B.Deeply in-the-money options have more time value than at-the-money options with the same amount of time to expiration.

C.At-the-money options have higher time value than either out-of-the-money or in-the-money options with the same remaining time to expiration.

D.At-the-money options have no time value.
参考答案：C
【莽学解析】The time value of at-the-money options is greater than that of either in-the-money or out-of-the-money options.平价期权的时间价值大于价内期权或价外期权的时间价值。

188.Robert the Trader has already written 1,000 call options with (percentage) delta of 0.670 and gamma of 0.090 such that his position delta is -670.0 and his position gamma is -90.0. He can buy or sell another call option on the stock; this additional call option has (percentage) delta of 0.560 and gamma of 0.150. Which trade will neutralize delta and gamma?
A.Buy 600 call options and buy 334 of the underlying shares
B.Buy 400 call options and sell 215 of the underlying shares
C.Sell 300 call options and buy 180 of the underlying shares
D.Sell 260 call options and sell 155 of the underlying shares
参考答案：A
【莽学解析】First, he can neutralize gamma with -(-90)/0.15 = long +600 options; then, total gamma = -90×(+600×0.15) = 0.But delta = -670 + (+600×0.560) =－334.0 such that long 334 shares are required to neutralize delta (and these shares do not impact gamma as the percentage gamma of shares is zero).首先，使gamma中性：-(-90)/0.15 = 600， 买入600份期权，然后，总gamma=－90×(600×0.15) = 0.而delta= －670＋ (600×0.560)=－334.0，则买入334份股票可以达到delta中性（股票的gamma为0，不会影响总gamma）。

189.A European call option has a (percentage) delta of 0.580. A trader creates a straddle by purchasing 1,000 of the call options and 1,000 put options with identical strike and maturity. However, the trader wants to neutralize delta. Which of the following trades, when added to the straddle, will neutralize the total position's delta?
A.Short 1,380 of the call options
B.Short 160 of the underlying shares
C.Long 720 of the put options
D.No additional trade required as the straddle is already delta neutral
参考答案：B
【莽学解析】As the put has delta = N(d1) - 1 = 0.58 - 1 = -0.42, the straddle has position delta = (+1,000×0.58) + (+1,000×-0.42)=580-420=+160, which is neutralized by shorting 160 shares这个看跌期权的delta为= N(d1) - 1 = 0.58 - 1 = -0.42,，这个跨式期权的delta为=(1,000×0.58) ＋(1,000×－0.42)=580－420= 160，通过带160份股票可以达到delta中性。

190.Consider a European call option on a non-dividend-paying stock. The strike price is $80.00 while the stock price is currently $90.00. Barbara the Risk Analyst employs a two-step (i.e., three months per step) binomial model to price the option, as shown below:
Barbara estimates the volatility of the stock is 26.0%, and she assumes the risk-free rate is 3.0%. Which of the following is nearest to her estimate of the price of the option?
A.$12.97
B.$13.84
C.$14.35
D.$15.50
参考答案：B
【莽学解析】The option value is expected value in three months, discounted to the present:

Today	3 months	6 months
		116.724 (36.724)
	102.495 (23.092)	
90.000		90.000 (10.000)
	79.029 (4.927)	
		69.395 (0.000)

[($23.0920×49.642%) ($4.9270×50.358%)]×e^(-0.030×0.25)=$13.8399期权价值是三个月后的预期价值，折现计算为：[($23.0920×49.642%) ($4.9270×50.358%)]×e^(?0.030×0.25)=$13.8399

191.An at-the-money call option has a (percentage) delta of 0.600 and gamma of 0.030. A market maker writes (sells) 100 call options, but only after the stock price unexpectedly jumps $2.00, so the written options are immediately in-the-money by $2.00. How many shares should the market maker buy to neutralize the delta of the option position?

A.Long 3.0 shares

B.Long 60.0 shares

C.Long 63.0 shares

D.Long 66.0 shares

参考答案：D

【莽学解析】Gamma is the change in delta given a change in the stock price, such that if the stock price increases by $2.00, we expect the "percentage delta" to increase by 2.00×0.030=0.060 to 0.660; i.e., new delta =0.60+(2×0.030) = 0.660. The position delta is therefore -100×0.660=-66, such that 66 shares are purchased to neutralize delta.Gamma是给定股价变化后的增量变化，因此，如果股价上涨2.00美元，我们预计“百分比变化率”将增加2.00×0.030 = 0.060至0.660； 即新增量= 0.60＋（2×0.030）= 0.660。 因此，头寸delta为-100×0.660 = -66，因此购买了66股股份以达到delta中性。

192.Yesterday, a market maker sold (wrote) 100 at-the-money (ATM) call options when the percentage delta was 0.57. The market maker immediately started a daily dynamic delta hedge by purchasing the underlying shares to achieve a a position delta of zero (i.e., to neutralize delta). Today, the share price dropped such that the call option percentage delta reduced to 0.54. What is today's dynamic delta hedge trade?

A.Buy 3.0 shares

B.Sell 3.0 shares

C.Buy 54.0 shares

D. Sell 54.0 shares
参考答案：B
【莽学解析】The option position delta changed by -100×(0.54 - 0.57) = +3.0 such that 3.0 shares are sold. Put another way, Yesterday: the option position delta was -100×0.57 = -57; this required the purchase of 57 shares to achieve delta neutral. Yesterday's position = short 100 call options [@ 0.57 per option delta] + long 57 shares. Today: the option position changed to -100×0.54 = -54; three shares must be sold to reduce the share delta from 57 to 54. Today's position = short 100 call options [@ 0.54 per option delta] + long 54 shares. 期权头寸差改变了-100×（0.54-0.57）= 3.0，从而卖出了3.0股。 换句话说：昨天：期权头寸delta为-100×0.57 = -57； 这就需要购买57股才能达到中立的增量。昨天的头寸=空头100手看涨期权[@0.57每期权的delta] 多头57股。今天：期权头寸改为-100×0.54 = -54； 必须售出三股，才能将股本差异从57减少到54。今天的头寸=空头100个看涨期权[@0.54每期权的delta] 多头54股。

193. A stock with a (continuous) dividend yield of 1.0% has a current price of $30 and volatility of 22%. We use a two-step binomial model to value a two-year European style call option on the stock; i.e., each time step is one year. The risk-free rate is 3.0%. In the binomial tree, what is the stock price at the node with the lowest stock price?
A. $14.78
B. $19.32
C. $22.49
D. $25.25
参考答案：B
【莽学解析】A two-step binomial has six nodes; the lower price occurs at S(0)×d×d, in the lower right. d = exp[-volatility × SQRT(time_step)] = exp[-22% ×SQRT(1)] = 0.8025;The lowest node = $30×exp(-22%)^2 = $19.321一个两步二叉树有6个分节点，较低的价格在S(0) ×d×d，在二叉树右下方。D =exp[－volatility ×(√(time_step))]= exp[－22% ×√1] = 0.8025;最低的节点价格为$30×exp(－22%)^2 = $19.321

194. Each of the following is true about option gamma, EXCEPT which is false?
A. For a short-life option, as expiration approaches (i.e., as maturity decreases to zero), the gamma of both in-the-money (ITM) and out-of-the-money (OTM) options tends toward zero
B. For a short-life option, as expiration approaches (i.e., as maturity decreases to zero), the gamma of an at-the-money (ATM) option tends toward zero
C. If you write a covered call, you are short gamma; i.e., position gamma is negative
D. If you purchase a protective put, you are long gamma; i.e., position gamma is positive
参考答案：B
【莽学解析】Although for short-life OTM/ITM options, gamma tends to zero as maturity decreases toward zero, at-the-money options behave the opposite way: the gamma of ATM options is generally a decreasing function of maturity (i.e., gamma increases as maturity tends toward zero).尽管对于短期价外、价内期权，随着到期日趋近于零，gamma值趋于零，但平价期权的行为却相反：平价期权的gamma值通常是到期日的递减函数（即，gamma随着到期日的增加而增加） 趋于零）。

195. Portfolio manager Sally has a position in 100 option contracts with the following position greeks: theta = +25,000; vega = +330,000 and gamma = -200; ie., positive theta, positive vega and negative gammWhich of the following additional trades, utilizing generally at-the-money(ATM) options, will neutralize(hedge) the portfolio with respect to theta, vega and gamma?

A. Sell short-term options + sell long-term options (all roughly at-the-money)
B. Sell short-term options + buy long-term options (~ ATM)
C. Buy short-term options + sell long-term options (~ ATM)
D. Buy short-term options + buy long-term options (~ ATM)
参考答案：C
【莽学解析】For ATM options, vega and theta are increasing funtions with maturity;and ganma is a decreasing function with matutity. To buy short-term options + sell long-term options → negative position thera,negative position vega,and positive position gamma. In regard to (A),sell short-term + sell long-term options → positive thera,negative vega; negative gamma. In regard to (B),sell short-term + buy long-term options → positive thera,positive vega; and negative gamma. In regard to (D),buy short-term + buy long-term → negative thera,positive vega; and positive gamma.在ATM期权中，vega和theta随着期限的增加而增加，ganma随着期限的增加而减少。C选项：买入短期 卖出长期期权会产生负theta，负vega，正gamma。A选项：卖出短期 卖出长期期权会产生正theta，负vega，负gamma。B选项：卖出短期 买入长期期权会产生正theta，正vega，负gamma。D选项：买入短期 买入长期期权会产生负thera，正vega，正gamma。

196. How can a trader produce a short vega, long gamma position?
A. Buy short-maturity options, sell long-maturity options.
B. Buy long-maturity options, sell short-maturity options.
C. Buy and sell options of long maturity.
D. Buy and sell options of short maturity.
参考答案：A
【莽学解析】For vanilla options, gamma is the highest for short-term options. vega is highest for long-term options.对于普通期权，短期期权的gammag值最高。长期期权的vega最高。

197. Which of the following choices will effectively hedge a short call option position that exhibits a delta of 0.5?
A. Sell two shares of the underlying for each option sold.
B. Buy two shares of the underlying for each option sold.
C. Sell the number of shares of the underlying equal to one-half the options sold.
D. Buy the number of shares of the underlying equal to one-half the options sold.
参考答案：D
【莽学解析】Answer: D In order to hedge a short call option position, a manager would have to buy enough of the underlying to equal the delta times the number of options sold. In this case, delta = 0.5, so for every two options sold, the manager would have to buy a share of the underlying security. (Stop-loss strategies with call options are designed to limit the losses associated with short option positions. The strategy requires purchasing the underlying asset for a naked call position when the asset rises above the option’s strike price.)为了对冲空头看涨期权头寸，基金经理必须买入足够多的标的股票，以等于delta乘以卖出的期权数量。在这种情况下，delta = 0.5，也就是说，每卖出两份期权，经理就必须买一份标的证券。(看涨期权的止损策略被设计用来限制与空头期权头寸相关的损失。该策略要求在无担保买入期权的基础资产升至期权执行价格之上时购买该资产。)

198. A financial institution has the following portfolio of over-the-counter options on sterling A traded option is available with a delta of 0.6, a gamma of 1.5, a vega of 0.8. What position in the traded option and in sterling would make the portfolio both gamma neutral and delta

neutral?
A. Short position in 4000 traded options, long position in 1950 sterling.
B. Long position in 4000 traded options, short position in 1950 sterling.
C. Long position in 4000 traded options, long position in 1950 sterling.
D. Short position in 4000 traded options, short position in 1950 sterling.
参考答案：B
【莽学解析】The delta of the portfolio:-1,000×0.50-500×0.80-2,000×(-0.40)-500×0.70=-450The gamma of the portfolio:-1,000×2.2-500×0.6-2,000×1.3-500×1.8=-6000The vega of the portfolio:-1,000×1.8-500×0.2-2,000×0.7-500×1.4=-4000A long position in 4,000 traded options will give a gamma-neutral portfolio since the long position has a gamma of 4,000×1.5=+6,000. The delta of the whole portfolio (including traded options) is then: 4,000×0.6-450=1,950.Hence, in addition to the 4,000 traded options, a short position in 1,950 is necessary so that the portfolio is both gamma and delta neutral.投资组合的delta为：－1,000×0.50－500×0.80－2,000×(－0.40)－500×0.70=－450投资组合的gamma为：－1,000×2.2－500×0.6－2,000×1.3－500×1.8=－6000投资组合的vega为：－1,000×1.8－500×0.2－2,000×0.7－500×1.4=?4000多头4,000个交易期权的多头头寸将提供gamma中性投资组合，因为多头头寸的gamma为4, 000×1.5= 6, 000。然后，珍格格投资组合的delta为4,000×0.6?450=1, 950因此，除了4,000个交易期权外，还需要在1,950个空头头寸，以便该投资组合既是gamma中性又是delta中性。

199. The current price of a stock is $25. A call option is available with a $20 strike price that expires in three months. If the underlying stock exhibits an annual standard deviation of 25%, the current risk-free rate is 4.5%, N(d1) = 0.9737, and N(d2) = 0.9652, the Black-Scholes-Merton value of the call is closest to:
A. $4.39
B. $4.87
C. $5.25
D. $5.89
参考答案：C
【莽学解析】这道题的计算过程如下：

$$C = 25 \times (0.9737) - 20e^{-0.045 \times 0.25}(0.9652) = 5.25$$

200. A call option with a price of $3.52 has a vega of 18.50. If the volatility increases from 20.0% to 26.0% per annum, what is the estimated price of the option under the higher volatility?
A. $3.69
B. $4.63
C. $8.33
D. $9.07
参考答案：B
【莽学解析】change in option price = 0.06×18.5= +$1.11, such that new estimated option price = $3.52 + $1.11 = $4.63期权价格的变化0.06×18.5= $1.11，新的估计的期权价格为= $3.52＋$1.11 = $4.63

201.An options dealer sells equity call options. When sold, the options are at-the-money and the firm will be delta-neutral hedged. Which of the following statements is correct?I The options dealer will have a negative gamma and negative vega exposure.II Over time, gamma and vega will have less of an impact on the value of the option dealer's position if the option moves away from the money.

A.I only

B.II only

C.Both I and II

D.Neither I nor II

参考答案：C

【莽学解析】Because the options dealer has sold options, the dealer will have a negative gamma and negative vega exposure. When sold, the options are at-the-money, but over time the options will move in or out-of-the-money. Gamma and vega decline as the options move away from an at-the-money position, so gamma and vega will have less of an impact on the value of the option over time. Hence the correct answer is both I and II.卖出期权时会有负gamma与负Vega敞口，并且当出售时期权是平值状态，随着时间推移标的资产价格会发生变化，因此期权会进入实值或虚值状态，期权的gamma与Vega也会降低，所以随着时间的推移，gamma与Vega对期权价值的影响也会逐渐减弱。

202.Consider the following about a European call option with one year maturity and strike price of $100.00 while the stock's volatility is 30.0% per annum and the risk-free rate is 2.0%: When the stock price is $100.00, the option's delta is 0.5860 When the stock price increases by $1.00 to $101.00, the option's delta increases to 0.5990 Which is the BEST estimate of the option's gamma when the stock price is $100?

A.0.0130

B.0.2600

C.52.0

D.104.0

参考答案：A

【莽学解析】The rest of the information is not here necessary.Note this is a linear approximation (i.e., the secant near to the tangent), but it's very close (even as the deltas are themselves rounded) to the exact analytical gamma (at K = 100) of 0.129896此处没有其余信息。请注意，这是线性近似值（即正切线附近的割线），但是它非常接近于精确的解析gamma（在K = 100时）0.129896（即使增量本身是四舍五入的）

203.Which of the following statements is correct? 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.

A.I only.

B.II only

C.I and II

D.Neither

参考答案：D

【莽学解析】Statement I is false - rho of a call and a put will change, with expiration of time and it tends to approach zero as expiration approaches.Statement II is false-theta is

positive for long ITM European put.陈述I是假的，看涨期权和看跌期权的rho会随着时间的到期而变化，到期时趋于零。表述二为假- - -对于长期ITM欧式put为正。

204.A European put option on a non-dividend paying stock has a remaining life of 6 months with a strike of USD 50 and the risk-free rate of 1%, after 3 months which of the following stock prices has the highest time-value of the option (in% of stock price)?

A.USD 10

B.USD 40

C.USD 50

D.USD 60

参考答案：C

【莽学解析】The at-the-money option has the highest time value, given its highest theta.平值状态下的期权的theta的绝对值最大，时间价值最高。

205.Which of the following statements comparing VaR with expected shortfall is true?

A.Expected shortfall is sub-additive while VaR is not.

B.Both VaR and expected shortfall measure the amount of capital an investor can expect to lose over a given time period and are, therefore, interchangeable as risk measures.

C.Both VaR and expected shortfall depend on the assumption of a normal distribution of returns.

D.VaR can vary according to the confidence level selected, but expected shortfall will not.

参考答案：A

【莽学解析】VaR measures the expected amount of capital one can expect to lose within a given confidence level over a given period of time. One of the problems with VaR is that it does not provide information about the expected size of the loss beyond the VaR. VaR is often complemented by the expected shortfall, which measures the expected loss conditional on the loss exceeding the VaR. Note that since expected shortfall is based on VaR, changing the confidence level may change both measures. A key difference between the two measures is that VaR is not sub-additive, meaning that the risk of two funds separately may be lower than the risk of a portfolio where the two funds are combined. Violation of the sub-additive assumption is a problem with VaR that does not exist with expected shortfall.VaR衡量的是在给定的时间段内，在给定的置信度内，人们可以预期损失的资本的预期数量。 VaR的问题之一是，它没有提供有关超出VaR的预期损失规模的信息。 VaR通常由预期的缺口来补充，该预期的短缺以超过VaR的损失为条件来衡量预期的损失。 请注意，由于预期的缺口是基于VaR的，因此更改置信度级别可能会同时更改这两个指标。 两种方法之间的主要区别在于VaR不是次可加的，这意味着分别将两种基金的风险低于将两种基金合并在一起的投资组合的风险。 违反亚可加性假设是VaR的问题，在预期的短缺方面不存在。

206.To convert VaR from a one-day holding period to a ten-day holding period the VaR number is generally multiplied by:

A.2.33

B.3.16

C.7.25

D.10.00

参考答案：B

【莽学解析】We use the square root of time rule, so the number is √10=3.16.我们使用时间规则的平方根公式，√10=3.16

207.A department store chain has a B1 rating from Moody’s and a B+ rating from S&P. Its balance sheet reflects a large number of receivables from shoppers who use the chain’s private label credit card. The firm has decided to raise much needed funds for renovation by securitizing these receivables. Which of the following scenarios is the most likely outcome?
A.The bond issued in the securitization will be B1\/B+ rated because the department store chain is rated B1\/B+.
B.The asset-backed security (ABS) will have a senior tranche that is rated investment grade and whose face value is lower than the value of the receivables that were on the firm\u2019s balance sheet.
C.The asset-backed security (ABS) will be over collateralized with the receivables that had been on the firm\u2019s balance sheet and are now a liability of the special purpose entity (SPE).
D.The securitization will result in a bond with two tranches: one that is senior and receives a Ba3\/BB- rating and another that is junior and receives a B2\/B.
参考答案：B
【莽学解析】ABS bonds are rated with respect to the risk of the underlying assets (in these credit card receivables) not the risk of the originator of the assets. A large fraction of ABSs are structured with senior and sub tranches. The senior is usually AAA because it has the full backing of all the assets in the pool that the SPE owns, while the sub tranche only gets paid back if the senior tranche is paid in full. To ensure that the default risk is lower, the senior tranche is smaller than the pool of receivables backing the bond. If over collateralization is used, the collateral is an asset of the SPE not a liability. ABS债券是根据相关资产（在这些信用卡应收款中）的风险而不是资产发起方的风险来评级的。大部分的ABS由高级和次级付款构成。优先级通常为AAA，因为它拥有SPE拥有的资产池中所有资产的全额支持，而子级付款仅在优先级付款已全额支付时才得到偿还。为了确保降低违约风险，优先级债券的发行规模小于支持债券的应收账款池。如果使用超额抵押，则抵押品是SPE的资产而不是负债。

208.A portfolio contains three independent bonds each with identical (i.i.d.) $100 par value, 3.0% probability of default (EDF) and loss given default (LGD) of 100%. What is, respectively, the 95.0% confident and 99.0% confident portfolio value at risk (VaR)?
A.zero and zero at both 95% and 99%
B.$100 and $100 at both 95% and 99%
C.$200 at 95% and $300 at 99%
D.$285 at 95% and $300 at 99%
参考答案：B
【莽学解析】Probability of zero defaults= 〖(97%)〗^3=91.26% Probability of exactly one default (binomial)=C_n^k p^k 〖(1-p)〗^(n-k)=3×3%×〖(97%)〗^2=8.468% Cumulative Prob [zero or one default] is 99.74%. Both the 95% VaR and 99% VaR are one default. 0违约的可能性= 〖(97%)〗^3=91.26%只有一个违约的可能性（二项分布）=C_n^k p^k 〖(1?p)〗^(n?k)=3×3%×〖(97%)〗^2=8.468%上两种状况的累计概率为99.74%。95%VaR和99%VaR为默认值

209.Which of the following statements about stress testing are true? I. Stress testing can complement VaR estimation in helping risk managers identify crucial vulnerabilities in a portfolio. II. Stress testing allows users to include scenarios that did not occur in the lookback horizon of the VaR data but are nonetheless possible. III. A drawback of stress

PD, single bond			3.0%
Face per bond			100
Bonds Default(d)	Binomial PDF	Binomial CDF	Loss(L)
0	91.2673%	91.2673%	$0.00
1	8.4681%	99.7354%	$100.00
2	0.2619%	99.9973%	$200.00
3	0.0027%	100.00%	$300.00
sum	100.00%		

testing is that it is highly subjective. IV. The inclusion of a large number of scenarios helps management better understand the risk exposure of a portfolio.

A. I and II only

B. III and IV only

C. I, II, and III only

D. I, II, III and IV

参考答案：C

【莽学解析】All the statements are correct except IV. Because too many scenarios will make it more difficult to interpret the risk exposure.除IV外，所有陈述均正确无误。 因为太多的场景将使解释风险暴露更加困难。

210. A commodity-trading firm has an options portfolio with a two-day Value-at-Risk (VaR) of $2.5 million. What would be an appropriate translation of this VaR to a ten-day horizon under normal conditions?

A. $3.713 million

B. $4.792 million

C. $5.590 million

D. Cannot be determined

参考答案：C

【莽学解析】使用平方根法则：

Using the square root of time formula:

$$VaR_{10\text{-day}} = VaR_{2\text{-day}} \times \frac{\sqrt{10}}{\sqrt{2}} = 5.59$$

211. Consider two portfolios. One with USD 100 million credit exposure to a single B- rated counterparty. The second with USD 100 million on credit exposure split evenly between 50 B-rated counterparties. Assume that default probabilities and recovery rates are the same for all B-rated counterparties. Which of the following is correct?

A. The expected loss of the first portfolio is greater than the expected loss of the second portfolio and the unexpected loss of the first portfolio is greater than the unexpected loss of the second portfolio.

B. The expected loss of the first portfolio is greater than the expected loss of the second portfolio and the unexpected loss of the first portfolio is equal to the unexpected loss of the second portfolio.

C. The expected loss of the first portfolio is equal to the expected loss of the second portfolio and the unexpected loss of the first portfolio is equal to the unexpected loss of the second portfolio.

D. The expected loss of the first portfolio is equal to the expected loss of the second portfolio and the unexpected loss of the first portfolio is greater than the unexpected loss of the second portfolio.

参考答案：D

【莽学解析】Unexpected loss is the volatility of the expected loss. Therefore, there is diversified effect.意外损失是预期损失的波动性。 因此，存在多种效果。

212. Assume that portfolio daily returns are independent and identically normally distributed. Sam Neil, a new quantitative analyst, has been asked by the portfolio manager to calculate portfolio VaRs over 10, 15, 20, and 25 days. The portfolio manager notices something miss with Sam's calcula?tions, displayed here. Which one of the following VaRs on this portfolio is inconsistent with the others?

A. VaR(10-day)=USD 316M

B. VaR(15-day)=USD 465M

C. VaR(20-day)=USD 537M

D. VaR(25-day)=USD 600M

参考答案：A

【莽学解析】We compute the daily VaR by dividing each VaR by the square root of time. This gives 316/√10=100, then 120, 120, and 120. So, answer A is out of line.我们通过将每个VaR除以时间的平方根来计算每日VaR。 这样得出316/√10=100，，然后是120、120和120。因此，答案A不一致。

213. Given the 1 year transition matrix below, what is the probability that a company that is currently B rated will default over a given two year period?

Initial Period State	Next Period State		
	A	B	Default
A	85%	10%	5%
B	10%	80%	10%

A. 10.0%

B. 18.0%

C. 18.5%

D. 20.0%

参考答案：C

【莽学解析】The first period probability of default for a B- rated bond is 10%. In second

period, the probability of default is the probability of surviving year 1 and defaulting in year 2:The year 2 probability of default=(10%×5%) ＋(80%×10%)=8.5%Therefore, the two-period cumulative probability of default =10%＋8.5%=18.5%. B级债券在第一期违约概率为10%。 在第二阶段，违约的概率是第一年未违约且第二年违约的概率： 第二年违约的概率=(10%×5%) ＋(80%×10%)=8.5% 因此，两年的累计违约概率为=10%＋8.5%=18.5%

214.Consider the following single bond position of $10 million, a modified duration of 3.6 years, an annualized yield volatility of 2%. Using the duration method and assuming that the daily return on the bond position is independently identically normally distributed, calculate the 10-day holding period VaR of the position with a 99% confidence interval assuming there are 252 business days in a year.

A.$409,339

B.$396,742

C.$345,297

D.$334,186

参考答案：D

【莽学解析】

$$VaR(dP) = |-D \times P| \times VaR(dy) - \frac{1}{2} \times C \times P \times VaR(dy)^2$$

$$VaR(dy) = 2.33 \times 2\% \times \sqrt{10/252} = 0.0093$$

$$VaR(dP) = 3.6 \times 10{,}000{,}000 \times 0.0093 = 334{,}186$$

215.Consider a stock portfolio consisting of two stocks with normally distributed returns. The joint distribution of daily returns is constant over time and there is no serial correlation. Stock Epsilon has a market value of $100,000 with an annualized volatility of 22%. Stock Omega has a market value of $175,000 with an annualized volatility of 27%. Calculate the 95% confidence interval 1-day VaR of the portfolio. Assume a correlation coefficient of 0.3. Round to the nearest dollar assuming 252 business days in a year. The daily expected return is assumed to be zero.

A.$3,641

B.$5,023

C.$6,007

D.$7,176

参考答案：C

【莽学解析】

$$VaR = 1.65 \times \sqrt{(100{,}000 \times 22\%)^2 + (175{,}000 \times 27\%)^2 + 2 \times 0.3 \times 100{,}000 \times 22\% \times 175{,}000 \times 27\%} \times \sqrt{\frac{1}{252}} = 6{,}007$$

216. Bank Omega's foreign currency trading desk is composed of 2 dealers: dealer A, who holds a long position of 10 million CHF against the USD, and dealer B, who holds a long position of 10 million SGD against the USD. The current spot rates for USD/CHF and USD/SGD are 1.2350 and 1.5905 respectively. Using the variance/covariance approach, you worked out the 1 day, 95% VaR of dealer A to be USD77,632 and that of dealer B to be USD27,911. If the correlation coefficient between the SGD and CHF is +0.602 and assuming that these are the only trading exposures for dealer A and dealer B, what would you report as the 1 day, 95% VaR of Bank Omega's foreign currency trading desk using the variance/covariance approach?

A. USD 97,027

B. USD 105,543

C. USD 113,932

D. Cannot be determined due to insufficient data

参考答案：A

【莽学解析】

$$\sqrt{77{,}632^2 + 27{,}911^2 + 2 \times 77{,}632 \times 27{,}911 \times 0.602} = 97{,}029$$

217. You have been asked to estimate the VaR of an investment in Big Pharma Inc. The company's stock is trading at USD 23 and the stock has a daily volatility of 1.5%. Using the delta-normal method, the VaR at the 95% confidence level of a long position in an at-the-money put on this stock with a delta of -0.5 over a 1-day holding period is closest to which of the following choices?

A. USD 0.28

B. USD 0.40

C. USD 0.57

D. USD 2.84

参考答案：A

【莽学解析】

$$VaR = |\Delta| \times 1.645 \times \sigma \times S = 0.5 \times 1.645 \times 0.015 \times \$23 = \$0.28$$

The Δ of an at-the-money put is -0.5 and the absolute value of the Δ is 0.5.

218. An at-the money European call on the DJ EURO STOXX 50 index a strike of 2200 and maturing in 1 year is trading at EUR 350, where contract value is determined by EUR 10 per index point. The risk-free rate is 3% per year, and the daily volatility of the index is 2.05%. If we assume that the expected return on the DJ EURO STOXX 50 is 0%, the 99% 1-day VaR of a short position on a single call calculated using the delta-normal approach is closest to:

A. EUR 8

B. EUR 53

C.EUR 84
D.EUR 525
参考答案：D
【莽学解析】Since the option is at-the-money, the delta is close to 0.5. VaR(99% of call) = 0.5×2200×10×2.33×2.05%=EUR 525由于期权是平价的，delta接近0.5。VaR(99% of call) = 0.5×2200×10×2.33×2.05%=EUR 525

219.Analyst Sue observes that equity returns exhibit leptokurtosis but are symmetrical; i.e., skew is zero. Her value at risk (VaR) model assumes returns are normal. Which of the following errors is MOST LIKELY?
A.Her VaR model will neither under- nor over-estimate the actual VaR
B.Her VaR model will under-estimate VaR at all confidence levels
C.At low (high) confidence levels her VaR model will over-estimate (under-estimate) actual VaR
D.Her VaR model will over-estimate VaR at all confidence levels
参考答案：C
【莽学解析】At low (high) confidence levels her VaR model will over-estimate (underestimate)actual VaRA leptokurtic distribution has a higher peak and heavy tail than the normal density with the SAME variance. Therefore, depending on the extent of excess kurtosis, normal VaR will overstate actual VaR up to a certain confidence level, then as the heavy-tails dominate, will certainly underestimate actual VaR.在低（高）置信度下，她的VaR模型将高估（低估）实际VaR矮峰分布的峰和重尾比具有相同方差的正常密度高。 因此，根据过度峰度的程度，正常VaR会高估实际VaR到一定的置信度，然后随着重尾支配，肯定会低估实际VaR。

220.Bank A and Bank B are two competing investment banks that are calculating the 1-day 99% VaR for an at-the-money call on a non-dividend-paying stock with the following information: Current stock price: USD 120 Estimated annual stock return volatility: 18% Current Black-Scholes-Merton option value: USD 5.20 Option delta: 0.6 To compute VaR, Bank A uses the linear approximation method, while Bank B uses a Monte Carlo simulation method for full revaluation. Which bank will estimate a higher value for the 1-day 99% VaR?
A.Bank A.
B.Bank B.
C.Both will have the same VaR estimate.
D.Insufficient information to determine.
参考答案：A
【莽学解析】The VaR will always be higher under the linear approximation method than a full revaluation conducted by Monte Carlo simulation analysis.线性差值方法下的VaR总是比蒙特卡洛模拟分析的完全重估要高。

221.Consider the following levels of sophistication in Risk Management Models and Procedures: I. Mark to Market Analysis II. Stress/Scenario Analysis III. Simulation Value at Risk IV. Parametric Value at Risk. Which of the following lists these models in order of increasing sophistication?
A.II, I, IV, III
B.I, IV, III, II
C.I, II, III, IV
D.I, III, IV, II

参考答案：B

【莽学解析】The most basic approach to risk management is mark to market; Parametric VaR is theoretically clean. Simulation VaR is intuitively attractive, and stress/scenario analysis identifies and teats the assumptions of VaR.风险管理的最基本方法是标记市场。 参数VaR在理论上是干净的。 仿真VaR具有直观的吸引力，压力/场景分析可以识别和验证VaR的假设

222.A financial institution created a model to measure interest rate volatility. The historical distribution of interest rate volatility did not appear to be normally distributed due to the obvious large fat-tails. The firm is contemplating using a regime-switching volatility model to capture the apparent existence of time-varying high and low interest rate volatility. Which of the following statements best characterize the implementation of a regime-switching model for this firm?

A.The interest rate distributions are conditionally normally distributed assuming static interest rate volatility.

B.The assumption of normality is not appropriate in this case, and therefore, a regime-switching model is unlikely to work well.

C.The probability of large deviations from normality occurring are more likely with a regime-switching model.

D.The regime-switching model may resolve the fat-tail problem.

参考答案：D

【莽学解析】The implementation of a regime switching model is appropriate in cases such as this example where there appears to be fat-tails and deviations from normality caused by shifts in volatility to high and low levels. The regime-shifting model may resolve the fat-tail issues, and the return distributions will be conditionally normally distributed assuming time-varying volatility of interest rates.在这种情况下（例如，由于波动率高低波动而导致出现粗尾和偏离正常状态的情况），执行体制转换模型是合适的。 政权转移模型可以解决胖尾问题，假定利率随时间变化，收益率分布将有条件地正态分布。

223.John Flag, the manager of a USD 150 million distressed bond portfolio, conducts stress tests on the portfolio. The portfolio's annualized return is 12%, with an annualized return volatility of 25%. In the last two years, the portfolio encountered several days when the daily value change of the portfolio was more than 3 standard deviations. If the portfolio suffered a 4-sigma daily event, which of the following is the best estimate of the change in the value of this portfolio? Assume that there are 250 trading days in a year.

A.USD 9.48 million

B.USD 23.70 million

C.USD 37.50 million

D.USD 150 million

参考答案：A

【莽学解析】

$$\text{volatility}_{\text{daily}} = 25\% \times \sqrt{1/250} = 0.0158$$

A 4-sigma event therefore implies a loss equal to:4×0.0158×150=9.48 million.

224.Which of the following methodologies is least effective for estimating the VaR due to embedded options?
A.Delta gamma
B.Variance covariance
C.Historical simulation
D.Monte Carlo simulation
参考答案：B
【莽学解析】Variance covariance is based on the assumption that risks are linear with respect to the underlying prices, which is clearly not the case with options. Delta gamma method partially corrects for this error by including the gamma (convexity due to optionality), while the simulation approaches involve full valuation and hence include the risks due to optionality.方差协方差基于以下假设：风险相对于基础价格是线性的，而对于期权而言，显然不是这种情况。 Delta-gamma方法通过包括gamma（由于可选性而引起的凸度）来部分纠正此错误，而模拟方法涉及全面评估，因此包括由于可选性而带来的风险。

225.After evaluating the results of a firm's stress tests, an analyst is recommending that the firm allocate additional economic capital and purchase selective insurance protection to guard against particular events. In order to give management a fully informed assessment, it is important that the following is noted related to this strategy:
A.While decreasing liquidity risk exposure, it will likely increase market risk exposure.
B.While decreasing correlation risk exposure, it will likely increase credit risk exposure.
C.While decreasing market risk exposure, it will likely increase credit risk exposure.
D.While decreasing credit risk exposure, it will likely increase model risk exposure.
参考答案：C
【莽学解析】The purchase of insurance protection can transform market risk into counterparty credit risk.购买保险可以将市场风险转化为交易对手信用风险。

226.We assume a lambda parameter of 0.850 under an exponential smoothing (i.e., EWMA) approach to the estimation of today's (t) daily volatility. Yesterday (t-1) is the most recent daily return in our series. What are the weights assigned, respectively, to yesterday's and the day before yesterday's returns; i.e., weight (t-1) and weight (t-2)?
A.15.00% (t-1) and 2.25% (t-2)
B.15.00% and 12.75%
C.72.25% and 61.41%
D.85.00% and 72.25%
参考答案：B
【莽学解析】The most recent weight is the highest at (1-lambda); in this case, 1 - 85% = 15%.As successive weights have a constant proportion of lambda, the (t-2) weight = (1-lambda)×lambda; in this case, (1-85%)×85% = 12.75%最近的权重最高，为（1-λ）； 在这种情况下，1 - 85% = 15%。由于连续的权重具有恒定的λ比例，因此（t-2）权重= (1- λ)× λ；(1－85%)×85% = 12.75%

227.What is the appropriate interpretation of a 10 million overnight VaR figure, given a 95% confidence interval?
A.The bank can be expected to incur a minimum loss of 10 million in 5 out of the next 100 days.
B.The bank will incur a maximum loss of 10 million in 5 out of the next 100 days.

C. The bank can be expected to incur a minimum loss of 10 million in 95 out of the next 100 days.
D. The bank will incur a maximum loss of 10 million in 95 out of the next 100 days.
参考答案：A
【莽学解析】Another way of looking at it is that the bank can expected to exceed a loss of £10 million in no more than five of the next 100 days.另一种看待它的方式是，在接下来的100天之内，该银行的损失有望超过1000万英镑。

228. Which of the following statement（ ） about VaR is TRUE? I Value at risk is useful for examining a firm's day-to-day market risk exposure, but it may not accurately reflect the effects of a once-a-year event. II Value at risk relies on the assumption that historical data will serve as a predictor of the future. III Value at risk assumes a static portfolio, and may not be able to capture all trading activities.
A. I only
B. II only
C. III only
D. I, II and III
参考答案：D
【莽学解析】VaR measurement procedures assume that market volatility and correlations will remain stable. As such, VaR is more effective in measuring short-term risk than longer-term risks and may not capture the risk of all trading activities, particularly those associated with nonlinear products.VaR评估程序假设市场波动性和相关性将保持稳定。 因此，VaR在衡量短期风险方面比长期风险更为有效，并且可能无法捕获所有交易活动的风险，尤其是与非线性产品相关的交易活动

229. The VaR of a portfolio at 95% confidence level is 15.2. If the confidence level is raised to 99% (assuming a one-tailed normal distribution), the new value of VaR will be closest to:
A. 10.8
B. 5.2
C. 18.1
D. 21.5
参考答案：D
【莽学解析】95% confidence level requires a volatility multiple (alpha) of 1.65, while 99% confidence level requires a multiple of 2.33. Since VaR is directly proportional to this multiple, VaR(1%)=VaR(5%)×2.33/1.65=21.5.VaR(1%)=VaR(5%)×2.33/1.65=21.595%的置信度需要1.65的波动倍数（alpha），而99%的置信度则需要2.33的倍数。 由于VaR与该倍数成正比。

230. Which of the following VaR methodologies most closely resembles the approach followed by Risk Metrics?
A. Structured Monte Carlo
B. Stress testing
C. Delta-normal method
D. Historical simulation
参考答案：C
【莽学解析】The Risk Metrics approach uses a modified delta-normal method, using the logs of price ratios rather than rates of return.风险度量方法使用修正的delta-normal方法，使用价格比率的对数而不是回报率。

231.Consider the following single stock portfolio: Stock ABC has a market position of $200,000 and an annualized volatility of 30%. Calculate the linear VaR with 99% confidence level for a 10 business day holding period. Assume normal distribution and round to the nearest dollar.
A.$11,952
B.$27,849
C.$60,000
D.$88,066
参考答案：B
【莽学解析】这道题的计算过程如下：

$$\text{VaR} = 200{,}000 \times 2.33 \times 30\% \times \sqrt{10/252} = 27{,}849$$

232.Fat-tailed asset return distributions are most likely the result of time-varying:
A.Volatility for the unconditional distribution
B.Means for the unconditional distribution
C.Volatility for the conditional distribution
D.Means for the conditional distribution
参考答案：A
【莽学解析】The most likely explanation for "fat tails" is that the second moment or volatility is time varying for the unconditional distribution.对于“肥尾”最可能的解释是，对非无条件分布，第二时刻或波动性随时间而变化

233.Rational Investment Inc. is estimating a daily VaR for its fixed income portfolio currently valued at USD 800 million. Using returns for the last 400 days. (ordered in decreasing order, from highest daily return to lowest daily return), the daily returns are the following: 1.99%, 1.89%, 1.88%, 1.87%, …, -1.76%, -1.82%, -1.84%, -1.87%, -1.91%.At the 99% confidence level, what is your estimate of the daily dollar VaR using the historical simulation method?
A.USD 14.08m
B.USD 14.56m
C.USD 14.72m
D.USD 15.04m
参考答案：B
【莽学解析】VaR=1.82%×800=14.56mVaR=1.82%×800=14.56m

234.A risk manager states that the VaR of the portfolio at 95% confidence interval and 1-day holding period is $1 million. Which of the following statement is TRUE?
A.The daily loss on the portfolio will exceed $1 million 95% of time.
B.The daily loss on the portfolio will not exceed $1 million 95% of time.
C.The maximum loss that the portfolio can incur is $1 million at any point in time.
D.95% of risk managers will agree that the maximum loss on the portfolio will be $1 million.
参考答案：B
【莽学解析】This is standard definition of VaR, reworded slightly.这是VaR的标准定义，略有修改。

235.If you use Delta VaR for a portfolio of options, which of the following statements is always correct?
A.It necessarily understates the VaR because it uses a linear approximation.
B.It can sometimes overstate the VaR.
C.It performs most poorly for a portfolio of deep-in-the money options.
D.It performs most poorly for a portfolio of deep-out-of-the money options.
参考答案：B
【莽学解析】The correct answer is B. Using Delta VaR for a portfolio of options neglect the effect of Gamma. Gamma will be either positive or negative; as a result, without considering the effect of Gamma, VaR can be either overstated or understated. Moreover, gamma is largest for at-the-money options. In another word, Delta VaR performs most poorly for a portfolio of at-the-money options.正确答案是B。将Delta VaR用于选项组合会忽略Gamma的影响。 gamma将为正或负；结果，在不考虑gamma效应的情况下，VaR可能被高估或被低估。 此外，gamma在平价选择中最大。 换句话说，Delta VaR在平价期权组合中的表现最差。

236.It is often possible to estimate the Value at Risk of a vanilla European options portfolio by using a delta-gamma methodology rather than exact valuation formulas because:
A.Delta and gamma are the first two terms in the Taylor series expansion of the change in an option price as a function of the change in the underlying and the remaining terms are often insignificant.
B.It is only delta and gamma risk that can be hedged.
C.Unlike the price, delta and gamma for a European option can be computed in closed form.
D.Both A and C, but not B.
参考答案：A
【莽学解析】Delta-gamma methodology captures the first and second order changes in the price in relation to changes in the value of the underlying. For plain vanilla options this constitutes the major factors influencing the price of the options.Delta-Gamma方法可获取与基础价值变化相关的价格的一阶和二阶变化。 对于普通香草期权，这是影响期权价格的主要因素。

237.Borough Corporation has selected a single risk metric to target in its risk management process. Steve Roland, FRM, and Bill Pound, FRM, are discussing the implications of the choice. Roland says that having a single quantifiable risk metric is generally accepted as necessary in risk management. Pound says that the metric should be augmented with scenario analysis to account for crises and the human element of the market. With respect to these statements:
A.Both Roland and Pound are incorrect.
B.Both Pound and Roland are correct.
C.Roland is correct and Pound is incorrect.
D.Pound is correct and Roland is incorrect.
参考答案：B
【莽学解析】Having a single, quantifiable metric is generally required as a guideline to indicate when risk should be increased or decreased. There are many possible shortcomings, however, such as the measure not incorporating the human element of the market. Scenario analysis can improve the process by attempting to account for human activity such as predatory trading and including the possibility and consequences of extreme events.通常需要使用一个单一的，可量化的指标作为指示何时应该增加或减少风险的准则。 但是，存在许多可能的缺点，例如该措施未纳入

市场的人为因素。 场景分析可以通过尝试考虑人类活动（例如掠夺性交易）并包括极端事件的可能性和后果来改善流程。

238.What is the correct interpretation of a $3 million overnight VaR figure with 99% confidence level?
A.The institution can be expected to lose at most $3 million in 1 out of next 100 days.
B.The institution can be expected to lose at least $3 million in 95 out of next 100 days.
C.The institution can be expected to lose at least $3million in 1 out of next 100 days.
D.The institution can be expected to lose at most $6 million in 2 out of next 100 days.
参考答案：C
【莽学解析】VaR provides a loss estimate that is expected to be exceeded with the frequency at which the VaR was calculated.VaR提供的损耗估计值预计会被计算VaR的频率所超出。

239.Which of the following approaches to value at risk (VaR) estimation is the LEAST dependent (if at all) on the historical return series?
A.Parametric
B.GARCH(1,1)
C.Hybrid of parametric and nonparametric
D.Implied volatility
参考答案：D
【莽学解析】Implied volatility uses current prices.###In regard to (A), parametric approaches tend to use the historical returns to inform (fit) the parameters, at least.###In regard to (B), EWMA is parametric and hybrid is non-parametric 隐含波动率使用当前价格。关于（A），参数方法至少倾向于使用历史收益来告知（拟合）参数。关于（B），EWMA是参数性的，混合是非参数性的

240.R1≥R2,then, ρ(R1)≤ρ(R2)，is the mathematical equation for which property of a coherent risk measure?
A.Positive homogeneity
B.Translation invariance
C.Monotonicity
D.Subadditivity
参考答案：C
【莽学解析】This is a monotonic indicator in the risk measurement system.单调性：风险管理模型损失越大，风险越高。

241.An analyst at Bergman International Bank has been asked to explain the calculation of VaR for linear derivatives to the newly hired junior analysts. Which of the following statements best describes the calculation of VaR for a linear derivative on the S&P 500 Index?
A.For a futures contract, multiply the VaR of the S&P 500 Index by a sensitivity factor reflecting the percent change in the value of the futures contract for a 1% change in the index value.
B.For an options contract, multiply the VaR of the S&P 500 Index by a sensitivity factor reflecting the percent change in the value of the futures contract for a 1% change in the index value.
C.For a futures contract, divide the VaR of the S&P 500 Index by a sensitivity factor reflecting the absolute change in the value of the futures contract per absolute change in the

index value.
D.For an options contract, divide the VaR of the S&P 500 Index by a sensitivity factor reflecting the percent change in the value of the futures contract for a 1% change in the index value.
参考答案：A
【莽学解析】The following formula is used to calculate the VaR for a linear derivative:VaRp = ΔVaRfThe delta in the formula is a sensitivity factor that reflects the change in value of the derivatives contract for a given change in the value of the underlying. The delta adjustment to the VaR of the underlying asset accounts for the fact that the relative changes in value between the underlying and the derivatives may not be one for one but nevertheless are linear in nature. Note that options are non-linear.VaRp =ΔVaRf公式中的增量是一个敏感度因子，反映了基础合约价值发生给定变化时衍生工具合约价值的变化。 对基础资产的VaR进行的增量调整是由于以下事实：基础资产与衍生工具之间的价值相对变化可能不是一对一的，但本质上是线性的。 请注意，期权是非线性的。

242.A Monte Carlo VaR model is preferred over the Delta-normal approach when:
A.Volatilities change over time.
B.The portfolio has linear exposures to many sources of risk.
C.The risk factors have normal distributions and the portfolio consists of options.
D.The portfolio contains only US non-callable government bonds.
参考答案：C
【莽学解析】For portfolios containing options, the Monte Carlo simulation VaR methodology is preferred over the delta-normal approach, even when the distribution is normal. In the absence of options, the delta-normal (variance/covariance) methodology may be the best choice.对于包含期权的投资组合，即使分布是正态的，蒙特卡罗模拟VaR方法也比delta-normal方法更可取。 在没有选择的情况下，delta-normal方差/协方差）方法可能是最佳选择。

243.Which VaR methodology is least effective for measuring options risk?
A.Variance\/covariance approach
B.Delta\/gamma
C.Historical simulation approach
D.Monte Carlo approach
参考答案：A
【莽学解析】The analytic variance/covariance VaR methodology does not provide a reliable risk measure for options because options have a nonlinear payoff, which violates the assumption that the portfolio value distribution is normal.由于期权具有非线性收益，因此分析方差/协方差VaR方法不能为期权提供可靠的风险度量，这违背了投资组合价值分布为正态的假设。

244.A risk manager would like to measure VaR for a bond. He notices that the bond has a puttable feature. What effect on the VaR will this puttable feature have?
A.The VaR will increase.
B.The VaR will decrease.
C.The VaR will remain the same.
D.The effect on the VaR will depend on the volatility of the bond.
参考答案：B
【莽学解析】With a puttable feature, the investor is long an option, because he or she can

"put" back the bond to the issuer. This will create positive gamma, or lower VaR than otherwise.具有可售回功能，投资者长期以来可以选择，因为他或她可以将债券“返还”给发行人。 这将产生正的伽玛值，或比其他方式降低VaR。

245.Howard Freeman manages a portfolio of investment securities for a regional bank. The portfolio has a current market value equal to USD 6,247,000 with a daily variance of 0.0002. Assuming there are 250 trading days in a year and that the portfolio returns follow a normal distribution, the estimate of the annual VaR at the 95% confidence level is closest to which of the following?

A.USD 32,595

B.USD 145,770

C.USD 2, 297,854

D.USD 2,737,868

参考答案：C

【莽学解析】Annual VaR = 6,247,000 × (250^0.5) × (0.0002^0.5) × 1.645 = 2,297,854年化 VaR = 6,247,000 × (250^0.5) × (0.0002^0.5) × 1.645 = 2,297,854

246.The historical simulation approach is more likely to provide an accurate estimate of the VaR than the Risk Metrics approach for a portfolio that consists of:

A.a small number of emerging market securities

B.a small number of broad market indexes

C.a large number of emerging market securities

D.a large number of broad market indexes

参考答案：A

【莽学解析】The Risk Metrics approach is a delta-normal model that requires the returns to be approximately normally distributed, while the historical simulation model requires much less stringent assumptions. The returns on a portfolio with small number of securities is less likely to be normally distributed than a larger portfolio; and an emerging markets index is less likely to be normally distributed than a broad market index. Therefore the historical simulation approach will most likely provide a better VaR estimate than Risk Metrics for a portfolio with a small number of emerging market securities.风险度量方法是一种delta-normal模型，要求收益近似正态分布，而历史模拟模型所要求的假设则要宽松得多。 具有少量证券的投资组合的收益比较大的证券投资组合的正态分布可能性较小； 新兴市场指数的分布比大市场指数的可能性小。 因此，对于具有少量新兴市场证券的投资组合，历史模拟方法最有可能提供比风险度量更好的VaR估计。

247.A single stock has a price of USD 10 and a current daily volatility of 2%. Using the delta-normal method, the VaR at the 95% confidence level of a long at-the-money call on this stock over a one-day holding period is approximately:

A.USD 1.645

B.USD 0.16

C.USD 0.33

D.USD 0.23

参考答案：B

【莽学解析】Delta is 0.5 when call option is at the money. So, VaR=10×0.5×1.65×2%=0.165.当看涨期权平价时，Delta为0.5。VaR=10×0.5×1.65×2%=0.165

248.Monte Carlo simulation and the historical method are two means of calculating VaR. Which of the following describes a disadvantage of the Monte Carlo method compared to the historical method of calculating VaR? The Monte Carlo method: I. Takes advantage of the normal distribution. II. Incorporates flexibility in modeling price paths.

A.I only

B.II only

C.Both

D.Neither

参考答案：D

【莽学解析】The Monte Carlo approach allows for whatever relationships the VaR modeler would like to take into account It is the most flexible method for generating VaR; however, it comes at a cost of requiring substantial computing power, especially when the model used to generate portfolio relationships is complex.蒙特卡洛模拟考虑了VaR建模者想要考虑的任何关系。 但是，这是以需要大量计算能力为代价的，特别是当用于生成投资组合关系的模型复杂时。

249.In an attempt to understand country risk, Mary Ann Small, an analyst at Global Funds, examines multiple sources of information to determine the truest measure of risk. She considers sovereign risk ratings, default risk spreads, and composite measures of risk. Which of the following sources relies on surveys of several hundred economists to measures sovereign risk?

A.Political Risk Services.

B.The Economist.

C.Standard and Poor.

D.Euromoney.

参考答案：D

【莽学解析】Numerous services attempt to evaluate country risk in its entirety. They include Political Risk Services (PRS), The Economsit, Euromoney, and the World Bank. Euromoney surveys 400 economists who assess country risk factors and rank countries from 0 to 100, with higher numbers indicating lower risk.许多服务机构试图全面评估国家风险。它们包括政治风险服务(PRS)、经济、欧洲货币和世界银行。《欧洲货币》调查了400名经济学家，他们评估了各国的风险因素，并将各国从0到100进行排序，数字越高表示风险越低。

250.Which of the following is NOT an approach to estimate the VaR?

A.GARCH

B.Parametric

C.Simulation

D.Delta-normal

参考答案：A

【莽学解析】GARCH is a method to predict volatility.GARCH是一种预测波动率的方法。

251.Which of the following statements is incorrect, given the following one-year rating transition matrix?

A.BBB loans have a 4.08% chance of being upgraded in one year.

B.BB loans have a 75.73% chance of staying at BB for one year.

C.BBB loans have an 88.21% chance of being upgraded in one year.

D.BB loans have a 5.72% chance of being upgraded in one year.

参考答案：C

From/To (%)	AAA	AA	A	BBB	BB	B	CCC/C	D	Non Rated
AAA	87.44	7.37	0.46	0.09	0.06	0.00	0.00	0.00	4.59
AA	0.60	86.65	7.78	0.58	0.06	0.11	0.02	0.01	4.21
A	0.05	2.05	86.96	5.50	0.43	0.16	0.03	0.04	4.79
BBB	0.02	0.21	3.85	84.13	4.39	0.77	0.19	0.29	6.14
BB	0.04	0.08	0.33	5.27	75.73	7.36	0.94	1.20	9.06
B	0.00	0.07	0.20	0.28	5.21	72.95	4.23	5.71	11.36
CCC/C	0.08	0.00	0.31	0.39	1.31	9.74	46.83	28.83	12.52

【莽学解析】The chance of BBB loans being upgrade over 1 year is 0.02%＋0.21%＋3.85%=4.08%. The chance of BB loans staying at the same rate over 1 year is 75.73%. The chance of BBB loans staying at BBB or being upgraded over 1 year is 4.08%＋84.13%=88.21%. The chance of BB loans being upgrade in one year is 0.04%＋0.08%＋ 0.33% ＋5.27%=5.72%. BBB级贷款在1年以上升级的可能性是：0.02%＋0.21%＋3.85%=4.08% BB级贷款在一年内保持相同利率的可能性是75.73%BBB级贷款在BBB停留或升级超过1年的机会是：4.08%＋84.13%=88.21% BB级贷款在一年内升级的机会是：0.04%＋0.08%＋ 0.33%＋5.27%=5.72%.

252. Bank regulators are examining the loan portfolio of a large, diversified lender. The regulators' main concern is that the bank remains solvent during turbulent economic times. Which of the following is most likely the area on which the regulators will want to focus?

A. Expected loss, since each asset can expect, on average, to decline in value from a positive probability of default.

B. Expected loss, given the decrease in underwriting standards of new loans.

C. Unexpected loss, since the bank will need to set aside additional capital for the unlikely event that recovery rates are smaller than expected.

D. Unexpected loss, since the bank will need to set aside additional capital for the unlikely event that usage given default is smaller than expected.

参考答案：C

【莽学解析】Unexpected loss is a measure of the variation in expected loss. As a precaution, the bank needs to set aside sufficient capital in the event that actual losses exceed expected losses with a reasonable likelihood. For example, smaller recovery rates would be indicative of larger actual losses.意外损失是对预期损失变化的一种度量。 作为预防措施，如果实际损失有合理可能性超过预期损失，银行需要预留足够的资本。 例如，较小的回收率将表示较大的实际损失。

253. A large bank currently has a security portfolio with a market value of $145 million. The daily returns on the bank's portfolio are normally distributed with 80% of the distribution lying within 1.28 standard deviations above and below the mean and 90% of the distribution lying within 1.65 standard deviations above and below the mean. Assuming the standard deviation of the bank's portfolio returns is 1.2%, calculate the VaR(5%) on a one-day basis.

A.$2.87 million
B.$2.23 million
C.$2.04 million
D.Cannot be determined from information given
参考答案：A
【莽学解析】VaR(5%)=1.65×1.2%×145,000,000=2,871,000VaR(5%)=1.65×1.2%×145,000,000=2,871,000

254.Delta-normal, historical simulation and Monte Carlo are various methods available to compute VaR. If underlying returns are normally distributed, then the
A.Delta-normal method VaR will be identical to the historical-simulation VaR.
B.Delta-normal method VaR will be identical to the Monte-Carlo VaR.
C.Monte-Carlo VaR will approach the delta-normal VaR as the number of replications ("draws") increases.
D.Monte-Carlo VaR will be identical to the historical-simulation VaR.
参考答案：C
【莽学解析】In finite samples, the simulation methods will be in general different from the delta-normal method, and from each other. As the sample size increases, however, the Monte-Carlo VaR should converge to the delta-normal VaR when returns are normally distributed.在有限样本中，模拟方法通常会与增量法则方法有所不同，并且彼此之间会有所不同。 但是，随着样本数量的增加，当收益呈正态分布时，蒙特卡洛VaR应当收敛于delta-normal VaR。

255.The Basel Committee on Banking Supervision has written stress testing principles for banks related to supervision. How many of the following statements are most likely correct regarding recommendations to supervisors? I Supervisors should make annual comprehensive assessments of a bank's stress testing procedures. II It is necessary for supervisors to question the use of stress tests that produce unrealistic results or are inconsistent with a bank's risk appetite. III It is prudent for supervisors to conduct additional stress tests using common scenarios within a bank's jurisdiction. IV For a robust analysis, supervisors should utilize capital ratios in their assessment of capital adequacy and determine the mobility of capital across business lines.
A.1
B.2
C.3
D.4
参考答案：C
【莽学解析】Statements II, III, and IV are correct. Statement I is incorrect because supervisors should make stress testing assessments more frequently than annually.陈述II，III和IV是正确的。 陈述I是不正确的，因为监测者每年更频繁地进行压力测试评估。

256.Which of the following is a disadvantage of the historical simulation method over the Risk Metrics model? The historical method requires: I. A worst-case scenario as an input. II. The future is determined by the past. III. Standard deviations and correlations. IV. The assumption of normal distributions for asset returns.
A.I and III only
B.II only
C.II and IV only

D. III only
参考答案：B
【莽学解析】The historical method requires that the future be determined by past asset price movements.历史方法要求未来取决于过去的资产价格走势。

257. A company reports a one-week VaR of $1 million at the 95% confidence level. Which of the following statements is most likely to be true?
A. The daily return on the company portfolio follows a normal distribution so that a one-week VaR could be computed.
B. The one-week VaR at the 99% confidence level is $5 million.
C. With probability 5%, the company will lose $1 million or more in one week.
D. With probability 95%, the company will not experience a loss greater than $95 million in one week.
参考答案：C
【莽学解析】A one-week 95% VaR of $1 million means that the company will suffer losses of more than $1 million in a single week 5% of the time.100万美元的一周95%VaR表示该公司将在5%的时间内在一周内遭受超过100万美元的损失。

258. Which of the following is not a true statement about internal credit ratings?
A. The \u201cat-the-point-in-time\u201d approach makes heavy use of econometric modeling that relates current financial variables to estimated default risk.
B. The \u201cthrough-the-cycle\u201d approach is forward-looking and attempts to incorporate future economic scenarios into current default risk estimates.
C. \u201cat-the-point-in-time\u201d credit scores volatility is much higher than \u201cthrough-the-cycle\u201d score volatility.
D. A sound internal system uses at-the-point-in-time scoring for small-to-medium-sized companies and private firms and through-the-cycle scoring for large firms.
参考答案：D
【莽学解析】The approaches are not compatible or directly comparable, and using the two approaches for different firms can yield highly inconsistent and misleading results.有效的内部评级体系要求所有公司采用同种评级方式，要么都是时点评级法，要么都是跨周期评级法。

259. Consider the following single stock portfolio: Stock ABC has a market position of $200,000 and an annualized volatility of 30%. Calculate the linear VaR with 99% confidence level for a 10 business day holding period. Assume normal distribution and round to the nearest dollar.
A. $11,952
B. $27,849
C. $60,000
D. $88,066
参考答案：B
【莽学解析】

$$VaR = 200{,}000 \times 2.33 \times 30\% \times \sqrt{10/252} = 27{,}849$$

260.Why is the delta normal approach not suitable for measuring options portfolio risk?
A.There is a lack of data to compute the variance\/covariance matrix.
B.Options are generally short-dated instruments.
C.There are nonlinearities in option payoff.
D.Black-Scholes pricing assumptions are violated in real world.
参考答案：C
【莽学解析】A delta-normal method will understate the risk of an options portfolio because of strong nonlinearity in the relationship between the value of the option and the price of the underlying.由于期权价值与标的价格之间的关系具有很强的非线性，因此三角正态方法会低估期权组合的风险。

261.Hugo Nelson is preparing a presentation on the attributes of value at risk. Which of Nelson's following statements is not correct?
A.VaR can account for the diversified holdings of a financial institution, reducing capital requirements.
B.VaR(10%) = $0 indicates a positive dollar return is likely to occur on 90 out of 100 days.
C.VaR(1%) can be interpreted as the number of days that a loss in portfolio value will exceed 1%.
D.VaR was developed in order to more closely represent the economic capital necessary to ensure commercial bank solvency.
参考答案：C
【莽学解析】VaR(X%) is defined as the dollar or percentage loss in portfolio value that will be exceeded only X% of the time. VaR(10%)=$0 indicates that there is a 10% probability that on any given day the dollar loss will be greater than $0. Alternatively, we can say there is a 90% probability that on any given day the dollar gain will be greater than $0. VaR was developed by commercial banks to provide a more accurate measure of their economic capital requirements, taking into account the effects of diversification.VaR（X%）定义为仅在X%的时间内会超过的美元或投资组合价值损失百分比。 VaR（10%）= $ 0表示在任何给定的日期，美元损失将大于$ 0的可能性为10%。 或者，我们可以说有90%的概率在任何给定的日子里美元收益都将大于$ 0。 VaR由商业银行开发，目的是在考虑多样化影响的情况下提供更准确的经济资本要求度量。

262.With regard to a bond credit rating change, which of the following statements is most correct?
A.A ratings downgrade is likely to lead to a stock price decrease and a bond price decrease.
B.A ratings downgrade is likely to lead to a stock price decrease and a bond price increase.
C.A ratings upgrade is likely to lead to a stock price increase and a bond price decrease.
D.A ratings upgrade is likely to lead to a stock price decrease and a bond price increase.
参考答案：A
【莽学解析】Bond ratings downgrades tend to result in stock price and bond price decreases. While bond ratings increases lead to bond price increases and stock price increases.债券评级下调往往会导致股票价格和债券价格下降。 债券评级的提高导致债券价格的上涨和股票价格的上涨

263.If stock returns are independently, identically, normally distribution and the annual volatility is 30%, then the daily VaR at the 99% confidence level of a stock market portfolio is approximately:
A.2.41%

B. 3.11%

C. 4.40%

D. 1.89%

参考答案：C

【莽学解析】

$$VaR = 2.33 \times 30\% \times \sqrt{1/250} = 4.40\%$$

264. The measurement error in VaR due to sampling variation should be greater with:

A. More observations and a high confidence level (e.g. 99%)

B. Fewer observations and a high confidence level(e.g. 99%)

C. More observations and a low confidence level (e.g. 95%)

D. Fewer observations and a low confidence level (e.g. 95%)

参考答案：B

【莽学解析】Sampling variability (or imprecision) increases with: (i) fewer observations and (ii) higher confidence levels. To show (i), we can refer to the formula for the precision of the sample mean, which varies inversely with the square root of the number of data points. A similar reasoning applies to (ii). A higher confidence level involves fewer observations in the left tails, from which VaR is computed.抽样变异性（或不精确性）随着以下因素的增加而增加：（i）观测值减少和（ii）高置信度。 为了显示（i），我们可以参考公式来计算样本均值的精度，该精度与数据点数的平方根成反比。 类似的推理适用于（ii）。 置信度越高，在左尾部观察到的值越少，从而可以计算VaR。

265. In designing its sovereign bond investment evaluation methodology, the Investment Committee at your firm is deciding whether to incorporate sovereign credit ratings by major firms (namely S&P, Moody's, and/or Fitch). Your colleague Mary asserts that your firm should NOT depend on sovereign credit ratings by major firms. She makes the four arguments below. Which of her arguments below is the MOST persuasive?

A. Credit rating agencies have a conflict of interests with respect to sovereign ratings

B. For any given sovereign bond, there is very little consistency among the agencies such that any almost rating can be justified

C. Agencies take too long to change sovereign ratings, including the special case of an overly-optimistic rating that fails to anticipate deep sovereign risk only to suddenly downgrade the sovereign multiple times in s short period of time

D. Historical analysis comparing sovereign ratings to actual sovereign defaults generally produce no statically meaningful correlation; i.e., default rates of investment grade sovereign bonds are not statistically less than default rates of speculative sovereign bonds

参考答案：C

【莽学解析】Agencies take too long to change sovereign ratings, including the special case of an overly-optimistic rating that fails to anticipate deep sovereign risk only to suddenly downgrade the sovereign multiple times in a short period of time. Ratings are upward biased There is herd behavior Too little, too late Vicious Cycle Ratings failures 机构花费太长时间来更改主权评级，包括过分乐观的评级的特殊情况，这种特殊情况无法预期到严重的主权风险，只能在短时间内多次突然降级主权。 评级向上偏 有牧群行为 太少太迟 恶性循环 评级失败

266.Which of the following statements are TRUE?
A.VaR fails to tell us what losses to expect once the VaR threshold is breached.
B.VaR gives an estimate of maximum loss at the given confidence interval.
C.VaR is the minimum loss for the (1 - confidence interval)% worst cases.
D.All of the above.
参考答案：D
【莽学解析】Since the VaR is the minimum loss in the worst case, it fails to tell us what losses to expect once the VaR threshold is breached.由于VaR在最坏的情况下是最小的损失，因此无法告诉我们一旦VaR阈值被突破后会发生什么损失。

267.You are asked by your Chief Risk Officer to evaluate arguments he has heard to switch from VaR to conditional VaR as your firm's main risk measurement tool. Which of the following arguments is not correct?
A.Conditional VaR is a coherent risk measure in contrast to VaR.
B.Conditional VaR estimated for a confidence level corresponding to one minus the probability of default for the firm's target rating provides an unbiased measure of the amount of the economic capital required above the firm's bankruptcy threshold point to achieve the probability of default associated with the firm's target rating.
C.A low VaR does not mean that the firm will make small losses when VaR is exceeded, but a low conditional VaR means that the firm will make small losses when VaR is exceeded.
D.For the same confidence level, conditional VaR is greater than VaR.
参考答案：B
【莽学解析】Answer B, not the probability of default, the probability of significant.答案B，不是违约的概率，是显著性

268.Consider the risk of a long call on an asset with a notional amount of $1 million. The VaR of the underlying asset is 7.8%. If the option is a short-term at-the-money option, the VaR of the option position is slightly:
A.Less than $39,000 when second-order terms are considered.
B.More than $39,000 when second-order terms are considered.
C.Less than $78,000 when second-order terms are considered.
D.More than $78,000 when second-order terms are considered.
参考答案：A
【莽学解析】An at-the-money option has a delta of about 0.5 and a positive gamma. VaR_option=|Δ|×VaR(dS)-1/2×Γ×VaR(dS)^2. Because the gamma is positive, so the risk is slightly lower than the linear VaR, which is 0.5×7.8%×1=39,000.平价期权的Delta约为0.5，gamma为正。VaR_option=|Δ|×VaR(dS)?1/2×Γ×VaR(dS)^2由于gammag为正，因此风险略低于线性VaR，0.5×7.8%×1=39,000

269.What is the lowest tier of an investment grade credit rating by Moody's?
A.Baa1
B.Ba1
C.Baa3
D.Ba3
参考答案：C

【莽学解析】Investment grade debt is debt rated BBB- rated or better by Standard's and Poor and Baa3 or better by Moody's.投资级债务被Standard's and Poor评为BBB-或Moody评为Baa3。

270.Under the Moody's bond rating system, the threshold for non-investment grade debt is reached when a bond's rating falls from:
A.A to Baa
B.Baa to Ba
C.Ba to B
D.Caa to D
参考答案：B
【莽学解析】Bonds rated Baa and above are considered investment grade, and those rated Ba and below are non-investment grade. 评级为Baa及以上的债券被视为投资级，评级为Ba及以下的债券为非投资级。

271.A market risk manager uses historical information on 1,000 days of profit/loss information to calculate a daily VaR at the 99th percentile, of USD 8 million. Loss observations beyond the 99th percentile are then used to estimate the conditional VaR. If the losses beyond the VaR level, in millions, are USD 9, USD 10, USD 11, USD 13, USD 15, USD 18, USD 21, USD 24, and USD 32, then what is the conditional VaR?
A.USD 9 million
B.USD 32 million
C.USD 15 million
D.USD 17 million
参考答案：D
【莽学解析】Conditional VaR=(USD 9+USD 10+USD 11+USD 13+USD 15+USD 18+USD 21+USD 24+USD 32)/9=17millionConditional VaR=(USD 9 USD 10 USD 11 USD 13 USD 15 USD 18 USD 21 USD 24 USD 32)/9=17million

272.Value at risk (VaR) measures should be supplemented by portfolio stress testing because:
A.VaR does not indicate how large the losses will be beyond the specified confidence level.
B.Stress testing provides a precise maximum loss level.
C.VaR measures are correct only 95% of the time.
D.Stress testing scenarios incorporate reasonably probable events.
参考答案：A
【莽学解析】VaR indicates the potential loss at a given confidence level but doesn't reveal how much can be lost beyond that level. Stress testing provides this information.VaR表示在给定置信水平下的潜在损失，但没有透露超出该水平会损失多少。 压力测试可提供此信息

273.The VaR on a portfolio using a 1-day horizon is USD 100 million. The VaR using a 10-day horizon is:
A.USD 316 million if returns are not independently and identically distributed.
B.USD 316 million if returns are independently and identically distributed.
C.USD 100 million since VaR does not depend on any day horizon.
D.USD 31.6 million irrespective of any other factors.
参考答案：B
【莽学解析】如果收益是独立同分布的VaR_(10?day)=VaR_(1?day)×√10=316,000,000

If returns are independently and identically distributed, then

$$VaR_{10-day} = VaR_{1-day} \times \sqrt{10} = 316{,}000{,}000$$

274. The following table from Fitch Ratings shows the number of rated issuers migrating between two ratings categories during one year.

Year 0	Year 1					
	AAA	AA	A	BBB	Default	Total
AAA	45	4	2	0	0	51
AA	3	30	4	3	2	42
A	2	5	40	2	3	52
BBB	0	1	2	30	1	34
Default	0	0	0	0	0	0

Based on this information, what is the probability that an issue with a rating of A at the beginning of the year will be downgraded by the end of the year?

A. 13.46%

B. 13.44%

C. 9.62%

D. 3.85%

参考答案：C

【莽学解析】Downgrade case: A→BBB, A→DefaultProbability(A→BBB) = 2/52Probability(A→Default) = 3/52The total probability = 5/52 = 9.62%这道题的计算过程如下：Downgrade case: A→BBB, A→Default Probability(A→BBB) = 2/52 Probability(A→Default) = 3/52 The total probability = 5/52 = 9.62%

275. Assume you are using a GARCH model to forecast volatility that you use to calculate the one-day VaR. If volatility is mean reverting, what can you say about the t day VaR?

A. It is less than the\u221at\u00d7one-day VaR .

B. It is equal to\u221at\u00d7one-day VaR .

C. It is greater than\u221at\u00d7one-day VaR.

D. It could be greater or less than the\u221at\u00d7one-day VaR.

参考答案：D

【莽学解析】Square root of time rule: If fluctuations in a stochastic process from one period to the next are independent, volatility increases with the square root of the unit of time. When volatility is mean reverting, the effect depends on whether we are currently above/below the long-run variance.时间的平方根规则：如果随机过程中从一个周期到下一个周期的波动是独立的，则波动率会随时间单位的平方根增加。 当波动率是均值回复时，影响取决于我们当前是否在长期方差之上或之

下

276. A commodity-trading firm has an options portfolio with a two-day Value-at-Risk (VaR) of $2.5 million. What would be an appropriate translation of this VaR to a ten-day horizon under normal conditions?

A. $3.713 million

B. $4.792 million

C. $5.590 million

D. Cannot be determined

参考答案：C

【莽学解析】使用平方根的公式:VaR_(10?day)=VaR_(2?day)×√10/√2=5.59

Using the square root of time formula:

$$\text{VaR}_{10-\text{day}} = \text{VaR}_{2-\text{day}} \times \frac{\sqrt{10}}{\sqrt{2}} = 5.59$$

277. A trader has an option position in crude oil with a delta of 100,000 barrels and gamma of 50,000 barrels per dollar move in price. Using the delta-gamma methodology, compute the VaR on this position, assuming the extreme move on crude oil is $2.00 per barrel.

A. $100,000

B. $200,000

C. $300,000

D. $400,000

参考答案：A

【莽学解析】

$$\text{VaR}(df) = |\Delta| \times \text{VaR}(dS) - \frac{1}{2} \times \Gamma \times \text{VaR}(dS)^2 = 100{,}000 \times 2 - \frac{1}{2} \times 50{,}000 \times 2^2 = 100{,}000$$

278. In the presence of fat tails in the distribution of returns, VaR based on the delta-normal method would (for a linear portfolio):

A. Underestimate the true VaR.

B. Be the same as the true VaR.

C. Overestimate the true VaR.

D. Cannot be determined from the information provided.

参考答案：A

【莽学解析】The VaR would be underestimated because of the greater frequency of losses in the tails of the distribution.由于分布尾部损失的频率更高，因此VaR会被低估。

279. You are analyzing the risk management system of an asset manager. The asset manager's objective is to follow S&P 500. The portfolio does not have any options. Which of the following is best suited to measure this risk?

A. Absolute VaR using historical simulation

B. Absolute VaR using delta normal approach
C. Tracking error VaR using delta normal approach
D. Tracking error VaR using Structured Monte Carlo approach
参考答案：C
【莽学解析】First, we need to compute tracking error VaR only. Second, for simple portfolios, delta normal approach is sufficient.首先，我们只需要计算跟tracking error VaR。 其次，对于简单的投资组合，正常增量法就足够了。

280. A bank has calculated a Value at Risk (VaR) of $10 million on its portfolio on a 1-day 99% confidence interval. Assuming a normal distribution which of the following is true?
A. The bank expects to lose more than $31.6 million only once every 2.74 years.
B. The bank expects to lose more than $10 million once every 100 business days.
C. The bank expects to lose less than $10 million 90 days out of every 100 days.
D. The bank expects to lose more than $100 million only once every 2.74 years.
参考答案：B
【莽学解析】Given a $10 million, 1-day, 99% VaR, the bank should expect to lose at least $10 million during 1% of the business days in the year, or once in every 100 business days.给定1000万美元，1天，99%的VaR，该银行应期望在一年的工作日内（至少每100个工作日）损失至少1000万美元。

281. Which of the following is most accurate with respect to Delta-normal VaR?
A. The delta-normal method provides accurate estimates of VaR for assets that can be expressed as a linear or non-linear combination of normally distributed risk factors.
B. The delta-normal method provides accurate estimates of VaR for options that are at- or near-the-money and close to expiration.
C. The delta-normal method provides accurate estimates of VaR by generating a covariance (correlation) matrix and measuring VaR using relatively simple matrix multiplication.
D. The delta-normal method provides accurate estimates of VaR for options and other derivatives over ranges even if deltas are unstable.
参考答案：C
【莽学解析】The delta-normal method provides accurate estimates only if the risks can be expressed as a linear combination. While away from the money options have small Gamma, the delta-normal method provides accurate estimates for deep out-of-the-money and deep in-the-money options.仅当风险可以表示为线性组合时，增量正态方法才能提供准确的估计。 尽管远离货币期权的Gamma值较小，但delta-normal法可提供对价外期权和价内期权的准确估计。

282. A small hedge fund is running a portfolio with a 5-day VaR of $3.1 million. Assuming normal conditions what is the best estimate for VaR over a 2-day horizon?
A. $1.2 million
B. $2.0 million
C. $2.5 million
D. $3.1 million
参考答案：B
【莽学解析】

$$\text{VaR}_{2-\text{day}} = \text{VaR}_{5-\text{days}} \times \frac{\sqrt{2}}{\sqrt{5}} = 1.96$$

283.Mixed Fund has a portfolio worth USD 12,428,000 that consists of 42% of fixed income investments and 58% of equity investments. The 95% annual VaR for the entire portfolio is USD 1,367,000 and the 95% annual VaR for the equity portion of the portfolio is USD 1,153,000. Assume that there are 250 trading days in a year and that the correlation between stocks and bonds is zero. What is the 95% daily VaR for the fixed income portion of the portfolio?

A.USD 21,263

B.USD 46,445

C.USD 55,171

D.USD 72,635

参考答案：B

【莽学解析】

The computation follows: $\text{VaR}^2_{(\text{portfolio})} = \text{VaR}^2_{(\text{stocks})} + \text{VaR}^2_{(\text{fixed income})}$

Assuming the correlation is $1{,}367{,}000^2 = 1{,}153{,}000^2 + \text{VaR}^2_{(\text{fixed income})}$

$\text{VaR}_{(\text{fixed income})} = 734{,}357$

Next convert the annual VaR to daily VaR: $734{,}357/\sqrt{250} = 46{,}445$

284.Which of the following are valid uses of Value at Risk? I Setting risk limits II Maximizing returns III Comparing risk across asset classes IV Identifying key risk factors in a portfolio

A.I and III

B.II and IV

C.I, III and IV

D.II, III and IV

参考答案：C

【莽学解析】VaR was originally developed as a framework for setting risk limits for traders and portfolio managers. Its use has been extended to the identification of risk factors and to compare risks across asset classes.VaR最初是作为为交易员和投资组合经理设置风险限制的框架而开发的。 它的用途已扩展到识别风险因素并比较资产类别之间的风险

285.Over the next year, an operational process model predicts a 95% probability of no loss occurrence and a 5% probability of a single loss occurrence. If the single loss occurs, the severity is characterized by three possible outcomes: $10.0 million loss with 20% probability, $18.0 million loss with 50% probability, and $25.0 million loss with 30% probability. What is the model's one-year 90% expected shortfall (ES)?

A.$9.25 million

B.$10.00 million

C.$13.88 million

D.$18.50 million

参考答案：A

【莽学解析】The 10% loss tail includes 5% of no loss (i.e., the 90% to 95% CDF) and 5% of the loss event.The average of this 10% tail is therefore given by:50% × 0 50% × [E (loss | loss event)] = 50% × [20% × 10 50% × 18 30% × 25] = $9.25 million10%的损失尾部包括5%的没有损失(即，即90%至95%的CDF)和5%的损失事件。因此，该10%尾部的平均值为:50% * 0 50% * [E(损失|损失事件)]= 50% *[20% * 10 50% * 18 30% * 25]= $ 925万

286.Tip-Top, Inc., (Tip-Top) has a commitment with Super Size Bank for $10 million. The terms of the loan are fixed and cannot be changed over its life. Tip-Top experiences an unexpected change in its credit rating from Ba to Baa. Explain the most likely effect on expected loss and actual loss.

A.Super Size Bank will increase the estimate of expected loss but not actual loss.

B.Super Size Bank will increase the estimate of expected loss and increase its estimate of actual loss.

C.Super Size Bank will decrease the estimate of expected loss but not actual loss.

D.Super Size Bank will decrease the estimate of expected loss and increase its estimate of actual loss.

参考答案：C

【莽学解析】A change from a Ba to Baa rating is an example of a credit upgrade. A credit upgrade will decrease the likelihood of default (EDF) reducing expected loss. Note that expected loss is an estimate of average future loss. Actual loss is by definition equal to zero until a credit event occurs.从Ba评级更改为Baa评级就是信用升级的一个例子。 信用升级将减少违约的可能性（EDF），从而减少预期损失。 注意，预期损失是平均未来损失的估计。 根据定义，在发生信用事件之前，实际损失等于零。

287.A portfolio manager bought 1,000 call options on a non-dividend-paying stock, with a strike price of USD 100, for USD 6 each. The current stock price is USD 104 with a daily stock return volatility of 1.89%, and the delta of the option is 0.6. Using the delta-normal approach to calculate VaR, what is an approximation of the 1-day 95% VaR of this position?

A.USD 1,120

B.USD 1,946

C.USD 3,243

D.USD 5,406

参考答案：B

【莽学解析】95% VaR_(1-day) of the underlying=104×1.65×1.89%=3.2495% VaR_(1-day) of the option=1000×0.6 ×3.24=1,94695% VaR_(1－day) of the underlying=104×1.65×1.89%=3.2495% VaR_(1－day) of the option=1000×0.6 ×3.24=1,946

288.The delta-normal method applied to a long call option position could be a reasonably accurate approach for calculating the VaR if the option is:

A.at the money

B.deep in the money

C.deep out of the money

D.close to expiry

参考答案：B

【莽学解析】The value of deep in the money options is predominantly determined by its delta.货币期权的深层价值主要取决于其增量。

289.Given the following ratings transition matrix, calculate the two-period cumulative probability of default for a 'B' credit.

Rating at beginning of period	Rating at End of period			
	A	B	C	D
A	0.95	0.05	0.00	0.00
B	0.03	0.90	0.05	0.02
C	0.01	0.10	0.75	0.14
Default	0.00	0.00	0.00	1.00

A.2.0%

B.2.5%

C.4.0%

D.4.5%

参考答案：D

【莽学解析】解析The first period probability of default for a B- rated bond is 2%.In second period the probability of default is the probability of surviving year 1 and defaulting in year 2:The year 2 probability of default=(0.03×0.00)+(0.90×0.02)+(0.05×0.14)=2.5%.Therefore, the two-period cumulative probability of default =2%+2.5%=4.5%.

290.Which statement best describes correlations and variances in times of financial crisis?

A.There are only marginal changes in correlations and variances in times of crisis, and therefore they do not need to be factored into risk management.

B.The diversification benefits decrease because correlations increase, and therefore your risk level increases.

C.The diversification benefits increase because correlations decrease, and therefore your risk level decreases.

D.VaR estimates using the Risk Metrics approach provide for the effects of increased correlations during periods crisis, and therefore the effects are factored into current positions.

参考答案：B

【莽学解析】During crisis situations the correlation between global markets increases as suggested by empirical evidence. The implication of this increased correlation is that the maximum amount to be lost for a given probability over a given time period increases. Therefore, diversification benefits decrease when correlations rise and therefore the risk level increases. VaR estimates do not provide for the effects of increased correlations during periods of crisis. Stress testing can be used to evaluate the effects of increased correlations.在危机情况下，经验证据表明，全球市场之间的相关性会增加。 这种增加的相关性的含义是，在给定的时间段内，给定的概率损失的最大数量增加了。 因此，当相关性增加时，多元化收益就会减少，因此风险水平也会增加。 VaR估计值并未提供危机期间相关性增加的影响。 压力测试可用于评估相关性增加的影响。

291.Given the following 30 ordered simulated percentage returns of an asset, calculate the VaR and expected shortfall (both expressed in terms of returns) at a 90% confidence level.-16, -14, -10, -7, -7, -5, -4, -4, -4, -3, -1, -1, 0, 0, 0, 1, 2, 2, 4, 6, 7, 8, 9, 11, 12, 12, 14, 18, 21, 23

A.VaR(90%)=10,Expected shortfall=14

B.VaR(90%)=10,Expected shortfall=15

C.VaR(90%)=14,Expected shortfall=15

D.VaR(90%)=18,Expected shortfall=22

参考答案：B

【莽学解析】10% of the observations will fall at or below the 3rd lowest observation of the 30 listed. Therefore, the VaR equals 10. The expected shortfall is the mean of the observations exceeding the VaR. Thus, the expected shortfall equals: (16 14)/2=15.10%的观察值将落在或低于列出的30个观察值中的第三低观察值。 因此，VaR等于10。预期的短缺是超过VaR的观测值的平均值。 因此，预期的缺口等于：（16 14）/ 2 = 15。

292.The standard VaR calculation for extension to multiple periods assumes that returns are serially uncorrelated. If prices display trends, the true VaR will be:

A.The same as the standard VaR.

B.Greater than standard VaR.

C.Less than standard VaR.

D.Unable to be determined.

参考答案：B

【莽学解析】This question assumes that VaR is obtained from the volatility using a normal distribution. With trends, or positive correlation between subsequent returns, the 2-day variance is greater than the one obtained from the square root of time rule.该问题假设VaR是使用正态分布从波动率获得的。 对于趋势或后续收益之间的正相关性，两天的变化大于从时间规则的平方根获得的变化。

293.Tip-Top, Inc., (Tip-Top) has a commitment with Super Size Bank for $10 million. The terms of the loan are fixed and cannot be changed over its life. Tip-Top experiences an unexpected change in its credit rating from Ba to Baa. Explain the most likely effect on expected loss and actual loss.

A.Super Size Bank will increase the estimate of expected loss but not actual loss.

B.Super Size Bank will increase the estimate of expected loss and increase its estimate of actual loss.

C.Super Size Bank will decrease the estimate of expected loss but not actual loss.

D.Super Size Bank will decrease the estimate of expected loss and increase its estimate of actual loss.

参考答案：C

【莽学解析】A change from a Ba to Baa rating is an example of a credit upgrade. A credit upgrade will decrease the likelihood of default (EDF) reducing expected loss. Note that expected loss is an estimate of average future loss. Actual loss is by definition equal to zero until a credit event occurs.Ba到Baa属于信用评级上调，这将将降低违约的可能性，降低预期损失。预期损失是对未来平均损失的估计。因此根据定义，在信用事件发生之前，实际损失为零。

294. Sally works for a fund that has a mandate to allocate a certain portion of its fund to developing (and/or emerging) countries in Asia, Africa or South America. However, the fund is sensitive to country risk, and in particular, the country's economic structure. With respect to economic structure, the fund seeks to avoid countries with a high degree of commodity export dependence. According to this criteria, which of the following countries is preferred; i.e. which is the LEAST dependent on commodity exports?

A. Chile

B. India

C. China

D. Saudi Arabia

参考答案：C

【莽学解析】China is easily the least dependent among the four. India is next, but Chile and Saudi Arabia are highly dependent.中国很容易成为这四个国家中最不需要依赖的国家。 印度位居第二，但智利和沙特阿拉伯高度依赖。