Konvexity

Solutions to Financial Markets and Products Sectional Test

1. Correct Answer is D: All three types of traders can take position in the derivative instruments. Speculators can simple take long or short position in derivative instruments. Hedgers take opposite position in the derivative instruments and the underlying instrument. Arbitrageurs can also take position into derivatives contracts such that the profit is riskless.
2. Correct Answer is D: The OTC markets have more credit risk than exchange traded markets.
3. Correct Answer is D: Applying put-call parity equation: C + PV(X) = P + S => C – P = S – PV(X). The call price will be equal to the put price if the stock price is equal to the present value of strike price.
4. Correct Answer is C: The position limits are not good for market efficiency as all the information is not captured by the stock price due to position limits.
5. Correct Answer is D: Discretionary order or market-not-held order is traded as market order except that execution may be delayed at the broker's discretion in an attempt to get a better price. Market-if-touched order or broad order becomes market order if the trade occurs at a particular price. Good-till-cancelled order is most likely a limit order and is in effect until executed or until the end of trading in the particular contract.
6. Correct Answer is D: Futures contracts are marked-to-marker on a daily basis. Hence, they are settled daily and not at the end of the contract. Rest all statements are correct about the futures market.
7. Correct Answer is A: Under gross basis, the total clearing margin = (20+15)*$15 = $525. Under net basis, the total clearing margin = (20-15)*$15 = $75. Difference = $525 - $75 = $450.
8. Correct Answer is A: As there is a decrease in price of caffeine, the final price of energy drink will go down. The cost of caffeine for GreenBull stays the same and its profit margin will decrease and the cost of caffeine for YellowBull goes down and its profit margin will remain the same.
9. Correct Answer is D: The Company is going to receive EUR. So, it will short EUR to hedge the currency risk. That means it will go long into EUR/USD contract. Total gain in futures position = 17 million*(1/0.7350 – 1/0.7360) = USD 0.031426 million. Total amount received at expiry spot rate = 17 million*(1/0.7325) = USD 23.20819 million. Total amount received by the company = 23.20819 + 0.031426 = USD 23.2396 million.
10. Correct Answer is B: Hedge effectiveness ratio = 0.94*(112/118) = 0.8922. The number of contracts required = 0.8922*(15,000/100) = 133.8. Rounding to the nearest whole number, we get 134 as our answer.
11. Correct Answer is A: Long position should be taken as we need to increase the beta of the portfolio. Total number of contracts required = (1.5 – 1.2)*(750,000,000/1,250*250) = 720.
12. Correct Answer is A: Mark will take a long position in the S&P futures because the required beta is zero and the current beta is negative due to short exposure.
13. Correct Answer is C: The forward interest rate = $(R_2T_2 – R_1T_1)/(T_2 – T_1)$ = (4.2*5 – 3.6*2)/(5-2) = 4.6%.
14. Correct Answer is D: The cash flow to you at the end of 2.5 years = $1,000,000*(0.045 – 0.042)*0.5 = $1,500. The profit at the end of 2-years = 1,500/ (1+0.042*0.5) = $1,469.15.

15. Correct Answer is B: Modified duration = D/ (1+y/m) = 7.8/ (1+0.0975/2) = 7.437.
16. Correct Answer is C: Par yield, c = (100-100d)*m/A where m=2, $d=e^{-0.068*2}$ = 0.87284 and $A=e^{-0.045*0.5} + e^{-0.05*1} + e^{-0.058*1.5} + e^{-0.068*2}$ = 3.7185. c = (100 – 100*0.87284)*2/3.7185 = 6.84%. This is the rate expressed with semi-annual compounding. The rate with continuous compounding = 2*ln (1+0.0684/2) = 6.72%.
17. Correct Answer is C: The present value of dividends = $0.50*e^{-0.065*3/12} + 0.50*e^{-0.065*6/12}$ = 0.9759. F_0 = (25 – 0.9759)*$e^{-0.065*6/12}$ = $24.818.
18. Correct Answer is C: $F_0 = S_0*e^{(r+u-y)T}$ = 1,560*$e^{(0.06+0.04-0.07)*6/12}$ = $1,583.58.
19. Correct Answer is A: The 3-year forward contract rate= 1.28*$e^{(0.035 - 0.025)*3}$ = 1.3190 USD/EUR.
20. Correct Answer is C: Only IV statement is wrong. Futures price understates the expected spot price when the return from the asset is positively correlated with the stock market.
21. Correct Answer is C: The cash price, P = (360/n)*(100-Y) => Y = 100 – (n/360)*P = 100 – (120/360)*96 = 68.
22. Correct Answer is A: Only III statement is correct. Rest two statements are wrong.
23. Correct Answer is A: The cheapest-to-deliver bond is the one for which Quoted bond price – (Settlement*Conversion factor) is the least.
24. Correct Answer is A: Forward interest rate = Futures rate – $0.5*\sigma^2*T_1T_2$. Here, T_1=4 years, T_2=4.25 years and σ=0.012. Therefore, the difference = $0.5*0.012^2*4*4.25$ = 0.001224 = 12.24 basis points.
25. Correct Answer is C: Number of contract required =PD_P/F_CD_F = 2,500,000*4.8/100,000*7.2 = 16.67 = 17 contracts.
26. Correct Answer is D: Both parties can gain from the swap. Rest all statements are correct.
27. Correct Answer is D: The value of fixed side bond = $3.25e^{-0.06*2/12} + 3.25e^{-0.068*8/12} + 103.25e^{-0,075*14/12}$ = 100.923. The value of floating side bond = $103.1e^{-0.06*2/12}$ = 102.074. The value of swap to fixed-payer = 102.074 – 100.923 = 1.151 per 100. So, total value = $1.151 million.
28. Correct Answer is C: The diff swap has less credit risk than the normal currency swaps because in a diff swap, the principal amount is not exchanged during the swap.
29. Correct Answer is B: The bank wants to pay floating as it is expecting interest rates to come down. So, receive-fixed and pay-floating is the ideal swap for the bank.
30. Correct Answer is C: The higher is the volatility, the higher is the value of the put option and vice versa.
31. Correct Answer is C: Lower bound for a European put option = $Ke^{-rt} – S_0 = 55e^{-0.06*0.5} – 45$ = $8.37.
32. Correct Answer is A: The lower bound for the European and American put option differs. For European put option, the lower bound is max (0, $Xe^{-rT} – S_0$) and for American put option, the lower bound is max (0, $X – S_0$).
33. Correct Answer is D: Using put-call parity equation, a synthetic put option position can be created by taking long position in call option and bond and short position in stock.
34. Correct Answer is B: Applying put-call parity equation, P = C + Xe^{-rT} –S = 4.5 + $75e^{-0.06*0.5}$ – 74 = $3.28.

35. Correct Answer is D: In a put-call parity equation, only 3 variables changes with the change in stock price. Ignoring the 4th variable, the equation becomes: C = P + S =>S – C = - P. So, the covered call graph is similar to the graph of a short put option.
36. Correct Answer is D: A strangle can have unlimited profit/loss while all other strategies have limited profit/loss potential.
37. Correct Answer is C: A strip involves buying 2 puts and 1 call option. It is the best suited for the given scenario as it pays more on the downside.
38. Correct Answer is B: A strap involves buying 2 call options and 1 put option. Total premium paid for the at-the-money strap = 2*4 + 3 = 11. Total payoff at expiry = 5. Net loss = 11 – 5 = $6.
39. Correct Answer is D: Payoff from cap = max [0, (notional price)*(index rate-cap strike)*(actual days/360)]. Here, index rate is lesser than the cap strike, so payoff would be zero.
40. Correct Answer is C: A net positive exposure would profit if the foreign currency appreciates with respect to the domestic currency.
41. Correct Answer is C: FX exposure will reduce if a bank is buying or selling currency for hedging purposes.
42. Correct Answer is A: Forward rate (DC/FC) = Spot rate (DC/FC) *$(1+r_{DC})/(1+r_{FC})$. So, if domestic rate is higher than forward rate would be more than the spot rate and hence trade at a premium.
43. Correct Answer is D: The bill of lading does not specify the quality of goods.
44. Correct Answer is C: Free-on-board (FOB) buyer is responsible for both ordinary and extraordinary transportation risk.
45. Correct Answer is A: Hedgers take only the basis risk, the price risk is taken by the speculators.
46. Correct Answer is A: Hedge effectiveness = 1 – (variance of basis)/(variance of spot) = 1-(0.005/0.10) = 0.95
47. Correct Answer is B: With increase in margin, speculators face more chances of funding liquidity risk.
48. Correct Answer is B: The underlying commodity is bought at the initiation.
49. Correct Answer is C: $F_{0,T} = S_0 e^{(r-\delta 1)T} = 8e^{(0.075-0.06)*0.5} = \$8.06$
50. Correct Answer is D: The 5-3-2 spread means buying 5 barrels of crude oil and producing 3 barrels of gasoline and 2 barrels of kerosene. Profit from the spread = 3*58 + 2*47.5 – 5*45 = $44

