

**CFE: Level 1**  
**Sample Questions Set #2**

The following are the sample questions that are illustrative of the questions that may be asked in a CFE Level 1 examination. These questions are only for illustration.

**Note:** (i) Each question carries 5 marks

(ii) In the actual exam, every wrong answer would earn -3 (negative 3) marks;

(iii) Use of Excel™ spreadsheet, even though not essential, may prove useful for answering some of the questions. No more than 20% of the total questions may require the use of Excel spreadsheet.

1. Risk Latte company is housed in a second tier commercial building in Hong Kong. It is very difficult to create and trade a financial derivative on this building due to many reasons. However, the most important reason would be:
  - (a) it would be very difficult to make an estimate of the volatility;
  - (b) the market for this is not complete;
  - (c) there is no active market price of the building
  - (d) All the above factors are equally important
  
2. Which of the following statements is TRUE about the price of a call option;
  - (a) it can always be thought of as a probability measure
  - (b) it is related to the price of a put option via the put-call parity measure
  - (c) it can be made equal to the price of the underlying stock price
  - (d) All of the above.
  
3. A quant while trying to calibrate short term smiles in a Heston like stochastic volatility model observed that both the volatility of volatility as well as the speed of mean reversion was exploding? This would be a strong indication of:
  - (a) Stochastically varying mean reversion which needs to be modelled
  - (b) the fact that the process wants to jump
  - (c) a need for double mean reverting process
  - (d) None of the above
  
4. A Brownian motion is equivalent to:
  - (a) a Random Walk
  - (b) a Random Walk plus a drift
  - (c) a Random Walk in more than one dimension
  - (d) a Random Walk in two dimension

5. Stochastic Volatility models has gained great popularity and respect within the derivatives trading and quant community, because:
- (a) they have been able to explain “volatility smile” in a self-consistent manner;
  - (b) their assumption about the dynamics of the underlying asset is realistic as opposed to say, local volatility models that only try to fit the smile
  - (c) they are essentially Brownian motion subordinated to a random clock
  - (d) All of the above;
6. Perhaps, the most frequently used non-trivial mathematical expression used in Monte Carlo simulation problems is  $\exp(\cdot)$ , the exponential function. A Pentium pro processor uses instructions with raw floating point numbers to estimate this function making use of the following mathematical identity:
- (a)  $e^x = \left[ 2^{(x \log_2 e)} - 1 \right] + 1$
  - (b)  $e^x = \left[ 2^{(x \log_2 e)} + 1 \right] - \log_2 x$
  - (c)  $e^x = \left[ 2^{(x \log_2 e)} + 2 \right] - \log_2 x$
  - (d) None of the above
7. Non-recombining trees occur in the valuation of:
- (a) Equity products
  - (b) FX products
  - (c) Interest rate products
  - (d) All of the above
8. Non-recombining trees occur when the stochastic process chosen to model the asset:
- (a) is strongly path dependent
  - (b) is strongly state dependent
  - (c) becomes degenerate quickly
  - (d) has a drift that is significantly smaller than the volatility
9. Who is the odd person out amongst the following
- (a) Fischer Black
  - (b) Robert Merton
  - (c) Bill Toy
  - (d) Emmanuel Derman

10. "Cable" is another name for the currency pair:
- (a) USD-JPY
  - (b) GBP-USD
  - (c) USD-CHF
  - (d) GBP-CHF
11. A "popcorn" curve is associated with:
- (a) a Statistical arbitrage trading strategy
  - (b) a quantitative asset allocation strategy
  - (c) an exotic derivatives (product) payoff function
  - (d) a credit risk model
12. If  $t$  is the time,  $A$  is a constant dollar amount and  $J_t$  is an indicator function taking the value +1 or -1, then a popcorn function can be written as:
- (a)  $P_t = J_t \times \sin(t)$
  - (b)  $P_t = A \times \max(J_t, J_t + 1)$
  - (c)  $P_t = A \times \max(J_t, J_t - 1)$
  - (d)  $P_t = A \times J_t \times \sin(t) + 2$
13. The generation of Sobol numbers (low discrepancy numbers for Monte Carlo Simulation) is initially carried out on a set of integers in the interval from:
- (a) 1 to a power of 2 minus one  $[1, 2^n - 1]$
  - (b) 1 to a power of 3 minus one  $[1, 3^n - 1]$
  - (c) 1 to a power of 2 minus two  $[1, 2^n - 2]$
  - (d) None of the above
14. A trader is long an asset at 100 in the Asian trade. After the Asian markets close, the asset drops to 97 in Europe and then crashes to 94 in New York trading. However, by New York close the asset is back at 98 and the next morning as Asian markets open the asset is back at 100. A Risk Manager monitoring the position in Asia will:
- (a) perceive an increased risk due to increase in VaR
  - (b) perceive an increased risk due to a downward trend in the asset
  - (c) perceive a decreased risk due to decrease in VaR
  - (d) no risk as the position is flat from Asian close to open
15. Gross Exposure of a hedge fund refers to:
- (a) total long positions
  - (b) total short positions
  - (c) sum of long and short positions
  - (d) sum of long positions plus liabilities

16. Which of the following distributions is best suited to estimate a random Loss given Default (LGD) in modelling of the credit risk of a portfolio (and used by industry practitioners who employ an asset value approach):
- (a) Beta distribution
  - (b) Cauchy distribution
  - (c) Inverse Normal distribution
  - (d) Weibull distribution
17. "Tail Swallowing" is associated with:
- (a) IPOs
  - (b) Rights Issue
  - (c) Bankruptcy Proceedings
  - (d) Extreme credit risk modeling
18. A market comprises N investors trading a particular stock. Each investor has limited capital and no possibility of communication with other investors. Each of them also believe that it is only worth buying the stock (to get value out of it) if neither too few are buying nor too many are buying. They also have no model to predict the stock price and have to make... their own predictions. This causes a problem: if all investors believe that others are buying the stock then nobody will buy the stock whereas if all investors believe that no one is buying the stock then everybody will end up buying the stock. This problem is related to the problem of:
- (a) Zero sum game
  - (b) Minority game
  - (c) Nash game
  - (d) Non-equilibrium game
19. Which of the following is a solution to the Black-Scholes Partial Differential Equation (PDE)?
- (a) Cash
  - (b) Equity
  - (c) Call Option
  - (d) All of the above;
20. Money in a savings account in a bank can be modelled as:
- (a) a partial differential equation
  - (b) an ordinary differential equation
  - (c) a stochastic differential equation
  - (d) a linear algebraic equation