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**Exam : 8007**

**Title : Exam II: Mathematical  
Foundations of Risk  
Measurement - 2015 Edition**

**Version : DEMO**

- 1.The bisection method can be used for solving  $f(x)=0$  for a unique solution of  $x$ , when
- A. The function  $f(x)$  is continuous and monotonic
  - B. The function  $f(x)$  is differentiable
  - C. The function  $f(x)$  is differentiable and we have an explicit expression for the derivative
  - D. The function  $f(x)$  is continuous

**Answer:** A

2.Consider a binomial lattice where a security price  $S$  moves up by a factor  $u$  with probability  $p$ , or down by a factor  $d$  with probability  $1 - p$ .

If we set  $d > 1/u$  then which of the following will be TRUE?

- A. The lattice will not recombine
- B. The probability of an up move will not be constant
- C. There will always be a downward drift in the lattice
- D. None of the above

**Answer:** D

3.Consider an investment fund with the following annual return rates over 8 years: +6%, -6%, +12%, -12%, +3%, -3%, +9%, -9% .

What can you say about the annual geometric and arithmetic mean returns of this investment fund?

- A. The arithmetic mean return is zero and the geometric mean return is negative
- B. The arithmetic mean return is negative and the geometric mean return is zero
- C. The arithmetic mean return is equal to the geometric mean return
- D. None of the above

**Answer:** A

4.Which of the following statements concerning class intervals used for grouping of data is correct?

When grouping data, attention must be paid to the following with regards to class intervals:

- 1. Class intervals should not overlap
  - 2. Class intervals should be of equal size unless there is a specific need to highlight data within a specific subgroup
  - 3. The class intervals should be large enough so that they not obscure interesting variation within the group
- A. Statements 2 and 3 are correct
  - B. Statements 1 and 2 are correct
  - C. All three statements are correct
  - D. Statements 1 and 3 are correct

**Answer:** B

5.An underlying asset price is at 100, its annual volatility is 25% and the risk free interest rate is 5%. A European call option has a strike of 85 and a maturity of 40 days. Its Black-Scholes price is 15.52. The options sensitivities are:  $\delta = 0.98$ ;  $\gamma = 0.006$  and  $\nu = 1.55$ .

What is the delta-gamma-vega approximation to the new option price when the underlying asset price changes to 105 and the volatility changes to 28%?

- A. 17.33

B. 18.75

C. 19.23

D. 20.54

**Answer: D**