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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 $\text{vega} = 1.55$.

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