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Exam : **8002**

Title : PRM Certification - Exam II:
Mathematical Foundations
of Risk Measurement

Version : Demo

1.For a quadratic equation, which of the following is FALSE?

- A. If the discriminant is negative, there are no real solutions
- B. If the discriminant is zero, there is only one solution
- C. If the discriminant is negative there are two different real solutions
- D. If the discriminant is positive there are two different real solutions

Answer: C

2.The natural logarithm of x is: .?

- A. the inverse function of $\exp(x)$
- B. $\log(e)$
- C. always greater than x, for $x > 0$
- D. 46

Answer: A

3.When a number is written with a fraction as an exponent, such as , which of the following is the correct computation?

- A. Take the square-root of 75 and raise it to the 5th power
- B. Divide 75 by 2, then raise it to the 5th power
- C. Multiply 75 by 2.5
- D. Square 75, then take the fifth root of it

Answer: A

4.You invest \$2m in a bank savings account with a constant interest rate of 5% p.a. What is the value of the investment in 2 years time if interest is compounded quarterly?

- A. \$2,208,972
- B. \$2,210,342
- C. \$2.205,000
- D. None of them

Answer: A

5.Solve the simultaneous linear equations: $x + 2y - 2 = 0$ and $y - 3x = 8$

- A. $x = 1, y = 0.5$
- B. $x = -2, y = 2$
- C. $x = 2, y = 0$
- D. None of the above

Answer: B

6.Find the roots, if they exist in the real numbers, of the quadratic equation

- A. 4 and -2
- B. -4 and 2
- C. 1 and 0
- D. No real roots

Answer: D

7.The sum of the infinite series $1+1/2+1/3+1/4+1/5+....$ equals:

- A. 12
- B. Infinity
- C. 128
- D. 20

Answer: B

8.Which of the following properties is exhibited by multiplication, but not by addition?

- A. associativity
- B. commutativity
- C. distributivity
- D. invertibility

Answer: C

9.Identify the type and common element (that is, common ratio or common difference) of the following sequence: 6, 12, 24

- A. arithmetic sequence, common difference 2
- B. arithmetic sequence, common ratio 2
- C. geometric sequence, common ratio 2
- D. geometric sequence, common ratio 3

Answer: C

10.What is the sum of the first 20 terms of this sequence: 3, 5, 9, 17, 33, 65,...- ?

- A. 1 048 574
- B. 1 048 595
- C. 2 097 170
- D. 2 097 172

Answer: C

11.What is the simplest form of this expression: $\log_2(165/2)$

- A. 10
- B. 32
- C. $5/2 + \log_2(16)$
- D. $\log_2(5/2) + \log_2(16)$

Answer: A

12.For each of the following functions, indicate whether its graph is concave or convex:

$$Y = 7x^2 + 3x + 9$$

$$Y = 6 \ln(3x)$$

$$Y = \exp(-4x)$$

- A. concave, concave, concave
- B. concave, convex, convex
- C. convex, concave, concave
- D. convex, convex, concave

Answer: C

13. You invest \$100 000 for 3 years at a continuously compounded rate of 3%. At the end of 3 years, you redeem the investment. Taxes of 22% are applied at the time of redemption. What is your approximate after-tax profit from the investment, rounded to \$10?

- A. \$9420
- B. \$7350
- C. \$7230
- D. \$7100

Answer: B

14. Which of the provided answers solves this system of equations?

$$2y - 3x = 3y + x$$

$$y^2 + x^2 = 68$$

- A. $x = 1$; $y = \text{square root of } 67$
- B. $x = 2$; $y = 8$
- C. $x = 2$; $y = -8$
- D. $x = -2$; $y = -8$

Answer: C

15. You intend to invest \$100 000 for five years. Four different interest payment options are available. Choose the interest option that yields the highest return over the five year period.

- A. a lump-sum payment of \$22 500 on maturity (in five years)
- B. an annually compounded rate of 4.15%
- C. a quarterly-compounded rate of 4.1%
- D. a continuously-compounded rate of 4%

Answer: C

16. What is the 40th term in the following series: 4, 14, 30, 52, ...- ?

- A. 240
- B. 4598
- C. 4840
- D. 4960

Answer: C

17. Let a , b and c be real numbers. Which of the following statements is true?

- A. The commutativity of multiplication is defined by
- B. The existence of negatives is defined by
- C. The distributivity of multiplication is defined by
- D. The associativity of multiplication is defined by

Answer: C

18. Which of the following is not a sequence?

- A. $, , , \dots - , \dots 0$

B. , , , , ...-

C. , , , , , , ...-

D. 30

Answer: D

19. Which of the following statements is not correct?

A. Every linear function is also a quadratic function.

B. A function is defined by its domain together with its action.

C. For finite and small domains, the action of a function may be specified by a list.

D. A function is a rule that assigns to every value x at least one value of y .

Answer: D

20. Which of the following statements is true?

A. Discrete and continuous compounding produce the same results if the discount rate is positive.

B. Continuous compounding is the better method because it results in higher present values compared to discrete compounding.

C. Continuous compounding can be thought as making the compounding period infinitesimally small.

D. The constant plays an important role in the mathematical description of continuous compounding.

Answer: C