

# Numerical & Statistical Method

## Question Bank

### ADVANCED LEARNER

- 1 \_\_\_\_\_ refers to how closely a computed or measured value agrees with the true value.
- A. Accuracy
  - B. Precision
  - C. Round-off
  - D. Certainty
- 2 What is the rounding off of a number?
- A. To change a number to its nearest prime number
  - B. To change a number to its nearest odd number
  - C. To change a number to its nearest whole number
  - D. To change a number to its nearest even number
- 3 If in bisection method,  $c = \frac{a+b}{2}$  and  $f(a).f(c) < 0$  then the root of equation  $f(x) = 0$  lies in interval \_\_\_\_\_.
- A.  $(c, b)$
  - B.  $(a, c)$
  - C.  $(a/2, c/2)$
  - D.  $(c/2, b/2)$
- 4 Secant Method is also called as?
- A. 1-point method
  - B. 2-point method
  - C. 3-point method
  - D. 4-point method
- 5 To solve differential equation:  $y' = y$  with  $y(0) = 1$ . using Euler's method, we have got \_\_\_\_\_.
- A.  $x_0 = 0$  and  $y_0 = 0$
  - B.  $x_0 = 1$  and  $y_0 = 0$
  - C.  $x_0 = 0$  and  $y_0 = 1$
  - D.  $x_0 = 1$  and  $y_0 = 1$
- 6 While using Modified Euler's method, we first use \_\_\_\_\_ to evaluate  $y_1$  to substitute in RHS of modified Euler's formula
- A. Runge-Kutta Method of 2nd order
  - B. Runge-Kutta Method of 4th order
  - C. Taylor's series Method
  - D. Euler's method
- 7 If  $N = 5, \Sigma X = 15, \Sigma Y = 80, \Sigma XY = 305$  and  $\Sigma X^2 = 55$  then we get value of  $a_1$  as
- A. 6.5

- B. 3.5
- C. -6.5
- D. -3.5

- 8** Mathematical model of Linear Programming is important because
- A. It helps in converting the verbal description and numerical data into mathematical expression
  - B. Decision makers prefer to work with formal models
  - C. It captures the relevant relationship among decision factors
  - D. It enables the use of algebraic techniques
- 9** The diagram obtained by plotting Data values on a rectangular coordinate system is called
- A. Argand's Diagram
  - B. Schwartz's Diagram
  - C. Scatter Diagram
  - D. Cartesian Diagram
- 10** If  $f(x) = 2x$  for  $x$  is in  $(0,a)$  and  $f(x) = 0$  otherwise then  $f(x)$  is pdf if and only if value of  $a$  =
- A. 0.25
  - B. 0.5
  - C. 0.75
  - D. 1**

### SLOW LEARNER

- 1** Formulations or model errors relate to bias that can be ascribed to \_\_\_\_\_.
- A. Complete Mathematical model.
  - B. Incomplete mathematical model.
  - C. Uncertainty in physical data.
  - D. Rounding off errors
- 2** A piece of iron rod was measured and found to be 120cms. But the actual value of the wood is 123cms. Find the relative error?
- A. 3%
  - B. 2.5%
  - C. 2.43%
  - 3.43%
- 3** In Newton Raphson Method we have  $x_0 = 1, f(x_0) = 1$  and  $f'(x_0) = 2$  then the next approximation is given by  $x_1 =$  \_\_\_\_.
- A. -1
  - B. 1
  - C. -0.5
  - 0.5
- 4** In Newton's forward difference interpolation formula, what is  $p$
- A.  $p = \frac{x-x_0}{h}$
  - B.  $p = x - x_0$
  - C.  $p = \frac{(x-x_0)^2}{h}$

$$p = \frac{x - x_n}{h}$$

- 5 Which of the following is not a valid row transformation?  
A.  $R1 \leftrightarrow R3$   
B.  $4R1 - R3$   
C.  $R1 - 4$   
D.  $R1 - 4R3$
- 6 In system of linear equation:  $AX = b$ , matrix  $[A|b]$  is called  
A. Complementary matrix  
B. Augmented Matrix  
C. Equivalent Matrix  
D. Transformation Matrix
- 7 Shreya makes small purses (x) and big purses (y). She can make no more than 8 purses a week. Which inequality represents the situation?  
A.  $x + y \leq 8$   
B.  $x + y \geq 8$   
C.  $3x + 2y \leq 8$   
D.  $3x + 2y \geq 8$
- 8 Least square estimation minimizes  
A. Summation of squares of errors  
B. Summation of errors  
C. Summation of absolute value of errors  
D. Random value
- 9 Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables?  
A. Gaussian Distribution  
B. Poisson Distribution  
C. Normal Distribution  
D. Exponential Distribution
- 10 The mean of Binomial Distribution  $X \sim B(n, p)$  is  
A. P  
B. np  
C. pq  
D. npq

### ASSIGNMENT QUESTIONS

- 1 In falling parachutist problem, downward force can be calculated using Newton's 2nd law of motion as \_\_\_\_\_  
A.  $mgh$   
B.  $mg$   
C.  $\frac{mv^2}{2}$   
D.  $2mgh$

- 2** If values of  $x$  are not equidistant then we use \_\_\_\_\_ formula for interpolation.
- A. Newton's Forward difference interpolation
  - B. countable
  - C. Lagrange's Interpolation
  - D. Newton's Central difference interpolation
- 3** The process of evaluating a definite integral from a set of tabulated values of the integrand  $f(x)$  is
- A. Numerical value
  - B. Numerical differentiation
  - C. Numerical integration
  - D. Quadrature
- 4** Normal Distribution is symmetric about \_\_\_\_\_
- A. Variance
  - B. Mean
  - C. Standard deviation
  - D. Covariance
- 5** If Expectation of random variable  $X$  is given by  $E(X) = 5$  then the value of  $E(4X + 3)$  is
- A. 20
  - B. 23
  - C. 80
  - D. 83