

F.Y.B.Sc IT Sem 2

Numerical and Statistical method

Sample Questions

1. Which of the following is caused by careless handling?

a) Systematic error

**b) Gross error**

c) Random error

d) None of the mentioned

2. The expansion of  $f(x, y) = e^{x \sin(y)}$  is

a)  $x + xy + \dots$

b)  $y + y^2 x + \dots$

c)  $x + x^2 y + \dots$

**d)  $y + xy + \dots$**

3. Expand  $f(x) = 1/x$  about  $x = 1$ .

**a)  $1 - (x-1) + (x-1)^2 - (x-1)^3 + \dots$**

b)  $1 + (x-1) + (x-1)^2 + (x-1)^3 + \dots$

c)  $1 + (x-1) - (x-1)^2 + (x-1)^3 + \dots$

d)  $1 - (x+1) + (x+1)^2 - (x+1)^3 + \dots$

4. Find the value of  $\sqrt{10}$

a) 3.1633

**b) 3.1623**

c) 3.1632

d) 3.1645

5. What is the coefficient of  $x^{101729}$  in the series expansion of  $\cos(\sin(x))$ ?

**a) 0**

b)  $1/101729!$

c)  $-1/101729!$

d) 1

6. Use Bisection Method to find out the root of  $x - \sin x - 0.5 = 0$  between 1 and 2.

**a) 1.497**

b) 1.947

c) 1.479

d) 1.974

7. A function is defined as  $f(x) = x^2 - 3$ . Between the interval [1,2] find the root of the function by Bisection Method.

a) 1.7334

b) 1.7364

c) 1.7354

**d) 1.7344**

8. The Newton-Raphson method of finding roots of nonlinear equations falls under the category of which of the following methods?

a) bracketing

**b) open**

c) random

d) graphical

9. The Newton Raphson method fails if \_\_\_\_\_

**a)  $f'(x_0)=0$**

b)  $f''(x_0)=0$

c)  $f(x_0)=0$

d)  $f'''(x_0)=0$

10. The equation  $f(x)$  is given as  $x^2-4=0$ . Considering the initial approximation at  $x=6$  then the value of  $x_1$  is given as \_\_\_\_\_

**a) 10/3**

b) 4/3

c) 7/3

d) 13/3

11. Solve the equations using Gauss Jordan method.

$$x + 2y + 6z = 15$$

$$3x + 4y + z = 16$$

$$6x - y - z = 20$$

a)  **$x=3.735, y=0.795, z=1.612$**

b)  $x=3.735, y=3.735, z=1.612$

c)  $x=3.735, y=1.612, z=3.735$

d)  $x=1.612, y=0.795, z=3.735$

12. The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric \_\_\_\_\_ definite matrices.

a) **Positive**

b) Negative

c) Zero

d) Equal

13. the value of integral  $\int_{-3}^3 x^4 dx$ ,  $n=6$  evaluated using trapezoidal rule is.

a) 112

b) 118

c) **115**

d) 125

14. the value of integral  $\int_0^3 e^{\sqrt{x}} dx$   $h=.025$  evaluated using Simpson's 1/3 rd rule is

a) 0.2859

b) **0.2654**

c) 0.2587

d) 0.2599

15. Given  $\frac{dy}{dx} = 1 + y^2$ ,  $y(0)=0$  and using step size of  $h= 0.2$  the value of  $y(0.2)$  using Runge-kutta method is

a) 0.1254

b) **0.2027**

c) 0.2895

d) 0.1326

16. Although it may seem overly simplistic, \_\_\_\_\_ is extremely useful both conceptually and practically.

a) **Linear regression**

b) Logistic regression

c) Gradient Descent

d) Greedy algorithms

17. Fit a second degree parabola to the following data.

x	1	2	3	4	5	6	7	8	9
y	2	6	7	8	10	11	11	10	9

a)  **$y = -0.2673x^2 + 3.5232x - 0.9286$**

b)  $y = 0.2673x^2 + 3.5232x - 0.9286$

c)  $y = 0.2673x^2 + 3.5232x + 0.9286$

d)  $y = -0.2673x^2 + 3.5232x + 0.9286$

18. In the linear programming, the lack of points for a solution set is said to be

a) have no feasible solution

b) have feasible solution

c) have single point method

d) have infinite point method

19. the region represented by  $2x + y \geq 6$  is

a) bonded

**b) Unbounded**

c) does not exist

d) none of these

20. the region represented by  $40x + 20y \leq 120, x \geq 0, y \geq 0$  is

**a) bonded**

b) Unbounded

c) does not exist

d) none of these

21. The random variables X and Y have variances 0.2 and 0.5 respectively. Let  $Z = 5X - 2Y$ . The variance of Z is?

a) 3

b) 4

c) 5

**d) 7**

22. In a Binomial Distribution, if p, q and n are probability of success, failure and number of trials respectively then variance is given by \_\_\_\_\_

a) np

**b) npq**

c)  $np^2q$

d)  $npq^2$

23. In a Binomial Distribution, if  $p = q$ , then  $P(X = x)$  is given by?

a)  ${}^n C_x (0.5)^n$

b)  ${}^n C_n (0.5)^n$

c)  ${}^n C_x p^{(n-x)}$

d)  ${}^n C_n p^{(n-x)}$

24. Poisson distribution is applied for \_\_\_\_\_

a) Continuous Random Variable

**b) Discrete Random Variable**

c) Irregular Random Variable

d) Uncertain Random Variable

25. Normal Distribution is applied for \_\_\_\_\_

**a) Continuous Random Distribution**

b) Discrete Random Variable

c) Irregular Random Variable

d) Uncertain Random Variable