Aryan College

Computer Oriented Statistical Methods

Unit I:

1. Define Truncation error. [2014],[2017]
2. Differentiate between absolute and relative error. [2017]
3. Define pivoting. [2017]
4. What is skew symmetric matrix? [2017]
5. What is ill conditional equation? [2017]
6. Define matrix. [2015],[2017]
7. What are the method of obtain solution of non-homogeneous system of linear equation. [2017]
8. Differentiate between forward and backward differences. [2017]
9. Define inverse matrix. [2015],[2017]
10. What is lower triangular matrix? [2017]
11. What are the pitfalls of floating point representation? [2017]
12. Define transpose of matrix. [2017]
13. Define properties of determinants. [2017]
14. Define interpolation and approximation. [2017]
15. Define triangularization and back substitution. [2017]
16. What is upper triangular matrix? [2016]
17. Write down the formula of Newton Gregory backward interpolation formula. [2016]
18. If 0.333 is the approximate value of 1/3, find absolute relative and percentage error. [2016]
19. Show that $\Delta \equiv E-I$ [2016]
20. Compute the percentage error in the time period $T=2\pi\sqrt{l/g}$ for l=1m if the error in the measurement of l is 0.01. [2016]
21. Find a real root of $x^3-x-1=0$ between 1 and 2 by bisection method. Compute three iterations. [2016]
22. Prove that: $e^x = (\frac{\Delta^2}{E})e^x \frac{Ee^x}{\Delta^2 e^x}$ [2016]
23. What is absolute error? [2015]
24. Write the formula for Regular Falsi Method. [2014],[2015]
25. Show that $e^{hD}=E$ where D=d/dx [2015]
26. What is average operator? [2013],[2015]
27. Suppose 1.414 is used as an approximation to $\sqrt{2}$. Find the absolute and relative error. [2013],[2015]
28. Find the sum of $123*10^3$ and $456*10^2$ and write the result in three digit mantissa form. [2014]
29. Find $\nabla =I- E^{-1}$. [2014]
30. What is summetric and skew sumetric matrix? [2014]
31. What γ linear equation and trans dental equation? [2014]
32. What is matrix and determinant? [2014]
33. Evaluate $\nabla \left[\frac{2^x}{(x+1)!}\right]$ [2014]
34. Evaluate the sum: [2014]
    S= $\sqrt{11} + \sqrt{12}+\sqrt{13} + \sqrt{14} + \sqrt{15}$ to 4 significant digit and find its absolute and relative error. [2014]
35. find the following values of the function f(x) for values of x are given as f(1)=4, f(2)=5, f(7)=5, f(8)=4. [2014]
36. A=$\begin{pmatrix} 2 & 5 \\ 6 & -1 \end{pmatrix}$ B=$\begin{pmatrix} 8 & 2 \\ 6 & 3 \end{pmatrix}$ C=$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$ find (i) ABC (ii) 2A+3B-5C [2014]
37. Solve the following system of equations using Cramer Rule. [2014]
    x+y+z=9
    2x+5y+7z=52
    2x+y-z=0
38. Explain types of matrix. [2014]
39. Prove that D=E-I [2013]
40. What is lower triangular and upper triangular matrix. [2013]
41. Multiply the Hoating point numbers: [2013]
    a. .5543 E 12 and .4111 E -15
    b. .1111 E 10 and .1234 E 15

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1. Find the root of equation $x^3 - 5x + 3 = 0$, correct to three decimal places using Bisection method. [2017]
2. Find the root of equation $x^3 - x + 4 = 0$, correct to three decimal places using Newton-Rapson method. [2017]
3. Write the short notes on following- [2017]
   a. Method of successive approximation
   b. Jacobi Method
4. Use gauss elimination method to solve the following system of linear equation- [2015],[2017]
   $2x_1 + 8x_2 + 2x_3 = 14$
   $x_1 + 6x_2 - x_3 = 13$
   $2x_1 - x_2 + 2x_3 = 5$
5. Use Gauss Seidel method to solve the following system of equation, accurate to four significant digits- [2017]

   $10x_1 + x_2 + 2x_3 = 14$
   $2x_1 + 10x_2 + x_3 = 51$
   $x_1 + 2x_2 + 10x_3 = 61$

6. Write the short notes on following- [2017]
   a. Gauss Jordon Method
   b. False Position Method
7. What is the difference between Gauss Jordan and Gauss elimination method? [2013],[2014],[2015],[2016]
8. Write the formula for Horner's method. [2016]
9. Define convergence of Newton Raphson method. [2014],[2015], [2016]
10. Use gauss elimination method to solve the following system of linear equation- [2016]
    $2x + y + z = 10$
    $3x + 2y + 3z = 18$
    $x + 4y + 9z = 16$
11. Use a Gauss forward formula to find a polynomial of degree four which takes the following values: [2013],[2016]

X:	1	2	3	4	5
F(x)	1	-1	1	-1	1
12. The population of a town was given. Estimate the population for year 1925: [2013],[2016]

Year (x):	1891	1901	1911	1921	1931
Population(y): (In thousands)	46	66	81	93	101
13. Solve $x^3 - 5x + 3 = 0$ by using Regular Falsie method. [2016]
14. Evaluate to four decimal places by Newton's Iterative Method. [2016]
15. Find a real root of equation $x = e^{-x}$ using Newton Raphson method. [2016]
16. Apply Gauss backward formula to find $\sin 45^0$ from the following table. [2016]

θ^0:	20	30	40	50	60	70	80
$\sin \theta$:	0.34202	0.502	0.64279	0.76604	0.86603	0.93969	0.98481
17. Use Lagrange's interpolation formula to fit a polynomial to the following data. [2016]

X:	-1	0	2	3
Ux:	-8	3	1	12
18. Solve the system of equations by LU factorization method. [2016]
    $2x + 3y + z = 9$
    $x + 2y + 3z = 6$
    $3x + y + 2z = 8$
19. Solve the system of equations by Gauss-Seidle iterative method: [2016]
    $27x + 6y - z = 85$
    $6x + 15y + 2z = 72$
    $x + y + 54z = 110$
20. Write Gauss Forward interpolation formula. [2015]
21. Write the Lagrange's formula for unequal intervals. [2015]

22. Find the root of the equation: $x^3-2x-5=0$ by the method of False positions correct to 3 decimal places.
    [2015]
23. The following table gives the distance in miles of visible horizon is given as: [2015]

X:	100	150	200	250	300	350	400
Y:	10.63	13.03	15.04	16.81	18.42	19.9	21.27

    Find y where x=218ft.
24. Find a root of the following equation correct to three decimal places using Horner's Method. [2015]
    $X^3+3x^2-12x-11=0$
25. Explain Gauss Forward method. [2014]
26. Write formula of Newton divided difference formula. [2014]
27. Use gauss elimination method to solve the following system of linear equation- [2014]
    $2x+4y+z=3$
    $3x+2y-2z=-2$
    $x-y+z=6$
28. Using Gauss Seidel Method solve the following system of equation: [2014]
    $83x+11y-4z=95$
    $7x+52y+13z=104$
    $3x+8y+29z=71$
29. Solve the equation using iteration method $2x-\log_{10}x=7$ [2014]
30. Find the real root of the equation $x^3-3x-5=0$ correct to four places of decimal by Newton Raphson Method.
    [2014]
31. Find real root of equation using false position method $x^3-2x-5=0$ [2014]
32. In an examination the number of candidates who obtain marks between certain limits were as follows:

Marks:	0-19	20-39	40-59	60-79	80-99
No of : Student	41	62	65	50	17

    Estimate the number of candidates who obtained less than 70 marks. [2014]
33. Given f(0)=8, f(1)=68 and f(5)=123 construct a divided differences table and find the value of f(2). [2014]
34. Apply central difference formula to obtain y_{32} giventhat [2014]
    $Y_{25}=.2707$ $y_{30}=.3027$ $y_{35}=.3386$ $y_{40}=.3794$
35. Explain horner's method. [2014]
36. What is bisection methodand successive approximation method. [2014]
37. Write formula for x_{n+1} in Regular Falsi method. [2013]
38. Write Newton gregory forward interpolation formula for equal intervals. [2013]
39. Solve by Regular Falsi Method $x^3-x-4=0$ [2013]
40. Find f(10) by Lngrange's formula [2013]

X:	5	6	9	11
Y:	12	13	14	16

41. Use Newton's Forward digfference interpolation formula to find the number of students who secured marks in the range from 36-45. [2013]

Marks:	30-40	40-50	50-60	60-70	70-80
No. of: Students	25	35	22	11	7

42. Use Gauss Jordan method to solve the following system of linear equation- [2013]
    $2x_1+8x_2+2x_3=14$
    $x_1+6x_2-x_3=13$
    $2x_1-x_2+2x_3=5$
43. Solve the system by Jacobi Method. [2013]
    $30x-2y+3z=75$
    $X+17y-2z=48$
    $X+y+9z=15$
44. Use Newton Raphson Method to solve: $x^3+3x^2-3=0$. [2013]
45. Use Bisection Method to solve; $x^3+5x+3=0$. [2013]