19 UBC 1A1 Mathematics-I: Computer Oriented Numerical and Statistical Methods (One mark Questions)

Unit I

1. …… is used to find the mid point.
   a. sqr(a + b)/2 b. (a+b)/2 c. (a * b)/2 d. a^2 / a
2. Another name of Successive Approximation Method is
   a. Simpon's method b. Lagrange's method c. Iteration method d. Bisection method
3. List out the methods used for solving higher degree polynomial equation.
4. What is meant by Polynomial equations?
5. What is the other name for Iteration method?
6. Newton Rapson Method b) Successive Approximation Method
7. False Position Method d) Bi-Section Method
8. How many methods are there to solve polynomial equations?
   a) 6 b) 7 c) 10 d) 5
9. Write down the formula for Newton Raphson method.
10. Which method is used for solving Polynomial equations?
    a. Factorization method b) Gauss Elimination Method c) Bisection Method
    d. Concurrent Deviation Method

Unit II

1. Method used to solve Simultaneous Algebraic Equation
   a. a)Deviation Method b)Gauss Jordan Method
   b. c)Horner's Method d)Newton's Method
2. The combination of co-efficient of the variables and right hand side constants is known as_____
   a. Inverse Matrix b)Unit Matrix
   b. Augmented Matrix d)None
3. What is meant by an Identity matrix?
4. Which method can be used for finding out the inverse of given matrix?
   a) Gauss Jacobi Method b) Gauss Seidal Method

b) Goss Jordan Method d) Gauss Elimination Method

5. Write the Lower Triangular Matrix (L) & Upper Triangular Matrix (U).
6. Define Augmented Matrix.
7. Differentiation formula for cos x is

   a) cosec x b) sec x c) -sin x d) tan x

8. What is another name for Identity Matrix?
9. Augmented Matrix b) Unit Matrix c) Sparse Matrix d)None
10. What is meant by square matrix?
11. Which method is used for finding out Inverse of Matrix?

    a. a)Gauss Seidel b)Gauss Jacobi

    b. c)Successive Approximation Method d)**Gauss Elimination**

12. What is the other name of Unit Matrix?

a)Augmented Matrix b) **Identity Matrix** c) Sparse Matrix d) Inverse Matrix

13.Triangularization method is also known as----------

a) **Factorization method** b) Gauss Elimination Method

c) Bisection Method d) Concurrent Deviation Method

Unit III

1. In ---------- rule, the number of sub intervals should be taken as multiples of 3.

   a. Trapezoidal Rule b. Simpson's 3/8 rule

   c. Simpson's 1/3 rule d. Identity rule

2. Write down the formula for Newton Backward Interpolation.
3. Write down the formula for Newton Forward Interpolation
4. Write down the formula for Trapezoidal Rule
5. Write down the formula for Simpson's 3/8 rule
6. Write down the formula for Simpson's 1/3 rule
7. Write a formula for Newton's forward differentiation.
8. Write a formula for Newton's backward differentiation
9. What is meant by Interpolation?

Unit IV

1. . ……. deals with the association of two or more variables.

a. a. regression b. **correlation** c. interpretation d. presentation

2. The value of correlation coefficient should be ……

a. a. = 1 b. < 1 c. <=1 d. >= 1

3. How many types of Correlation are there?

a. a. One b) Two c) Three d)Four

4. When one variable increases the other also increases

a. a) negative correlation b) **positive correlation** c) Simple correlation d) linear correlation

5. When one variable increases the other decreases

a. a) **negative correlation** b) positive correlation c) Simple correlation d) linear correlation

6. …….. is plotted on a paper in the form of dots.

a. a) graphical method b) scatter diagram c) bar chart d) pie chart

Unit V

1. .---------- is the measure of average relationship between two or more variables.

   a) Deviation b)Correlation c) **Regression** d)None

2. What is the relationship between correlation coefficient and regression coefficient?
3. What is regression coefficient?
4. Express the regression equation of X on Y.
5. Express the regression equation of Y on X.
6. State the regression coefficient of X on Y.
7. State the regression coefficient of Yon X.

ANSWERS :

UNIT-I:

1. (a+b)/2

2 .Iteration method

3. Bisection method, Successive Approximation method, False position method, Newton –Raphson's method, Horner's method.

4. Polynomial equation of degree n:

$X^n + a, x^{n-1} + a_2 x^{n-2} + \ldots\ldots + a_n = 0$

Eg: $3x^3 + 6x^2 + 4x + 7 = 0$

5. Successive Approximtion method

8. 6

9. $x_{n+1} = x_n - \frac{f\ x}{f'\ xn}$

10. Bisection method

UNIT-II:

1. Gauss Jordan method

2. Augmented matrix

3. An identity matrix is a matrix which contains the zeros and ones.

Eg : $\begin{matrix} 1 & 0 \\ 0 & 1 \end{matrix}$

4. Gauss elimination method

5. $L = \begin{matrix} 1 & 0 & 0 \\ l21 & 1 & 0 \\ l31 & l32 & 1 \end{matrix}$,$U = \begin{matrix} u11 & u12 & u13 \\ 0 & u22 & u23 \\ 0 & 0 & u33 \end{matrix}$

6. The co-efficient of the variables in the given matrix is known as Augmented matrix.

7. –Sinx

8. unit matrix

11.Gauss elimination

12.Unit matrix (or) Identity matrix

13. Factorization method.

UNIT III:

1. Simpson's 3/8 Rule

2. $y(x) = y_{\circ} + u\Delta y_{\circ} + \frac{u\ u}{!}\Delta\ _{\circ}\ \frac{u\ u}{!}\Delta\ _{\circ}\ \cdots$

3. $y(x) = yn + v\ yn\ \frac{}{!}\ \square\ \ n\ \frac{}{!}\ \square\ \ n\ \cdots$

4. $\begin{matrix} x \\ x \end{matrix}$ x– $sum\ of\ first\ an\ \ last\ or\ \ inat\ \ s$ $2\ sum\ of$ $maininor\ \ inat\ \ s$

5. $\begin{matrix} xn \\ x \end{matrix} f\ x\ \ x$ –h $_{\circ}$ n 3 1 2 4 5 .. n– 1 2 3 6 $\cdots$ n

6. $\int_{x}^{xn} f\ x$ – 。 n 2 2 4 6 ⋯ 4 1 3 5 ⋯

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K3-Level Questions

UNIT – I

1. Solve x=cos x correct to 3 decimal places by using Regular False Position Method
2. Solve the equation x (tanx) = -1 correct to 3 decimal places using Regular False method starting with a=2.5 and b=3.
3. Solve the equation x^3-4x+1=0 using Regular Falsi Method correct to 3 decimal places.
4. Using Newton's method, find the root between 0 and 1 of x^3=6x-4 Correct to 5 decimal places.
5. Solve the polynomial equation x^4-x-9 =0 correct to 3 decimal places using Newton Rapson method.
6. Find the root of the X-2SinX=0 by Newton's method correct to 3 decimal places.

UNIT – II

1. Solve using Gauss elimination method.

x+2y+z =3

2x+3y+3z=10

3x-y+2z =13

2. Solve using Gauss Jordan method.

2x + 4y +8z = 41

4x + 6y+10z = 56

6x + 8y +10z = 64

3. Solve using Gauss Jacobi Method

x+y+54z=110

27x+6y-z=85

6x+15y+2z=72

4. Solve using Gauss Seidal method

8x-3y+2z= 20

4x+11y-z= 33

6x+3y+12z=35

UNIT – III

1. 16.Find the value of y at X=21 from the following table using Newton's Interpolation formula.

   X: 20 23 26 29
   Y: 0.3420 0.3907 0.4384 0.4848

2. Find the value of y at x=21 and x=28 from the following data

X	20	23	26	29
Y	0.3420	0.3907	0.4384	0.4848

3. Using Lagrange's formula, find y(10) from the following table

X: 5 6 9 11

Y: 12 13 14 16

4. Evaluate

$$\int_0^1 \frac{1}{1+x^2}\,dx$$

using Trapezoidal rule with h = 0.2.

5. Evaluate $I = \int_0^6 \frac{1}{1+x}\,dx$ using Simpson's Rule (Both 1/3 & 3/8)

UNIT - IV

1. Write a short note on Scatter Diagram.
2. Explain positive and negative Correlation.
3. Calculate Karl Pearson's Co-efficient of Correlation from the following data.

RollNo	1	2	3	4	5
Marks in Accounts	48	35	17	23	47
Marks in Statistics	45	20	40	25	45

4. Calculate the rank correlation for the following data.

X	80	78	75	75	68	67	60	59
Y	12	13	14	14	14	16	15	17

UNIT – V

1. Write Short notes on Regression Analysis.

2. The pressure and specific volume of a super heated steam data is as follows :
   Volume v: 2 4 6 8 10
   Pressure p: 10.5 42.7 25.3 16.7 13.0

Volume v	2	4	6	8	10
Pressure p:	10.5	42.7	25.3	16.7	13.0

   Find the rate of change of pressure with respect to volume when v=2.

3. Calculate the regression taking the deviation of item mean X and Y series .

X	6	2	10	4	8
Y	9	11	5	8	7

4.Two random variables have the regression equations:

3x+2y-26=0

6x+ y-31=0

Find the mean values and the coefficient of correlation between X and Y. If the variance of X=25, find the standard deviation of Y from the data given above.

K4-Level Questions

UNIT - I

1. Solve using Bisection method $x^3-x-1= 0$ correct to 3 decimal places..
2. Solve the equation $x^3- 4x - 9$ using bisection method correct to 3 decimal places.
3. Solve the following equation using Iteration method $x^3 - 2x -5$ correct to three decimal places whose root lies between 2 and 3.
4. Solve the polynomial equation $x^3+x^2-1=0$ correct to 4 decimal places using Iteration method.
5. Find the positive root of $x^3-2 x^2 -3x-4 = 0$ correct to 3 decimal places using Horner's method.
6. Solve $x^3+3x-1=0$ using Horners method correct to 3 decimal places.

UNIT - II

1. Find by Gauss elimination, the inverse of the matrix

$$A= \begin{pmatrix} 4 & 1 & 2 \\ 2 & 3 & -1 \\ 1 & -2 & 2 \end{pmatrix}$$

2, Solve by using Gauss Jordan Method,

$3X +4Y +5Z = 18$

$2X - Y +8Z = 13$

$5X - 2Y+7Z = 20$

3. By the method of triangularization, solve the following system

$x+y+z=1$

$4x+3y-z=6$

$3x+5y+3z=4$

4. By the method of triangularization, solve the following system

$5X - 2Y+3Z=4$

$7X+Y-5Z=8$

$3X+7Y+4Z=10$

UNIT - III

1. Find X if Y=100 given from the following table by using Lagrange's Method.

X	3	5	7	9	11
Y	6	24	58	108	174

2. Using Lagrange's Method Find Y(10) from the following table by using.

X	5	6	9	11
Y	12	13	14	16

3. Find the 1st two derivatives of $x^{1/3}$ at X=50 and X=56 from the given table below.

X	50	51	52	53	54	55	56
Y	3.6840	3.7084	3.7325	3.7563	3.7798	3.8030	3.8259

4. The population of a certain town is given below. Find the rate of growth of the population in 1931.

Year	1931	1941	1951	1961	1971
Population In 1000's	40.62	60.80	79.95	103.56	132.65

UNIT IV

1. 10 competitors in a beauty contest or ranked by 3 Judges in the following order.

1 Judge	1	6	5	10	3	2	4	9	7	8
2 Judge	3	5	8	4	7	10	2	1	6	9
3 Judge	6	4	9	8	1	2	3	10	5	7

Determine which pair of judges has the nearest approach of common taste in beauty contest.

2. Calculate the spearman rank correlation for the given data:

X: 115 22 148 251 83 325 92 70 164
Y: 84 385 200 110 292 86 120 301 144

3. Calculate co-efficient of concurrent deviation from the following data.

Prize	368	384	385	361	347	384	395	403	400	385
Imports	22	21	24	20	22	26	24	29	28	27

4. Find the Pearson's correlation coefficient for the following data.

R no	1	2	3	4	5
Accounts marks	48	35	17	23	47
Stat marks	45	20	40	25	45

UNIT – V

1. In a correlation study the following values or obtain

	X	Y
Mean	65	67
StandardDeviation	2.5	3.7

Co-efficient of Correlation : 0.8
Find the two regression equation associated with the above values.

2. The following table shows degrees and blood pressure for 8 persons

Age	52	63	45	36	72	65	47	25
Blood Pressure	62	53	51	25	79	43	60	33

Obtain the regression equations blood pressure on the ages and the expected of a person who is 49 years old.

3. From the data given below find:
(i) the two regression equations.
(ii)the coefficient of correlation between marks in Economics and Statistics.
(iii)the most likely marks in statistics when the marks in Economics are 30.

Marks in Economics	25	28	35	32	31	36	29	38	34	32
Marks in Statistics	43	46	49	41	36	32	31	30	33	39

3. Height of fathers and sons are given below. Find height of the son when the height of the father is 70 inches.

Father(Inches)	71	68	66	67	70	71	70	73	72	65	66
Son(Inches)	69	64	65	63	65	62	65	64	66	59	62
