

**Bachelor of Computer Applications
Annual Examinations – 2006**

**Paper BCAD – 401
Numerical Statistics**

Time allowed: Three hours

Maximum Marks: 100

SECTION – I

Marks

Q1. Attempt all the objective type questions given below. 20X1=20

- (i) If unit of x in Kg, what will be the unit of relative error in x ?
- (ii) The error occurs in a number due to elimination of some digits is known as _____.
- (iii) The rate of convergence of Newton Raphson method to compute the root of a function $f(x) = 0$ is _____.
- (iv) The regular Falsi formula to compute root of a function $f(x) = 0$ is _____.
- (v) The inverse of identity matrix will be _____.
- (vi) If A is inverse of B , then what will be the inverse of A ?
- (vii) If $\text{rank}(A) = \text{rank}(A:B)$, then the set of equations $AX = B$ is _____.
- (viii) $\Delta^2 y_1 =$ _____.
- (ix) $E^2 y_3 =$ _____.
- (x) $\Delta^2/E y_3 =$ _____.
- (xi) Simpson's 1/3 rule is used for _____.
- (xii) The error in Trapezoidal rule is _____.
- (xiii) The error in Simpson's 1/3 rule is _____.
- (xiv) Pictogram is used for _____.
- (xv) _____ can be used to represent a mathematical relation.
- (xvi) Ogiue is known as _____.
- (xvii) According to Clark and Sekkade "An _____ is an attempt to find one single figure to describe the whole set of data".
- (xviii) The geometric mean (G.M.) of $x_1, x_2, x_3, \dots, x_n$ is _____.
- (xix) The Harmonic mean of positive real number x_1, x_2, \dots, x_n is defined as _____.
- (xx) Skewness shows the _____ data set.

SECTION – II

Q2. Attempt any six questions. All questions carry equal marks. 6X5=30

- (a) Define absolute, relative and percentage errors, with the help of suitable examples.
- (b) How rounding errors is differ from truncation error? Discuss with the help of suitable examples.
- (c) Find one real root of $e^{-2x} \text{_____} x^2 = 0$ by using regal falsi method.

- (d) Derive the formula to find p^{th} root of a real number N using Newton Raphson method.
- (e) Compute the adjoint and inverse of matrix

$$A = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 1 & -1 \\ 1 & 0 & 1 \end{bmatrix}$$

- (f) Show that following system of equation is consistent.

$$\begin{aligned} x + y + z &= 3 \\ x + 2y + 3z &= 4 \\ x + 4y + 9z &= 6 \end{aligned}$$

- (g) Interpolate the following tabulated values to find $f(5)$:

x :	2	4	6	8
$f(x)$:	60	70	80	90

- (h) Calculate standard deviation (σ) from the following data:

x :	0-5	5-10	10-15	15-20	20-25
$f(x)$:	4	1	10	3	2

SECTION – III

Q3. Attempt any five questions.

5X10=50

- (a) Derive the relation between central moments and moments about an arbitrary point. How these are used in calculation of Skewness & kurtosis.
- (b) Calculate Karl Pearson's coefficient of Skewness from the following data:

X :	1	2	3	4	5	6	7
Y :	10	18	30	25	12	3	2

- (c) Calculate the Karl Pearson coefficient of correlation from the following pairs of values:

X :	12	9	8	10	11	13	7
Y :	14	8	6	9	11	12	3

- (d) Calculate the error in Trapezoidal and Simpson's $1/3^{\text{rd}}$ rule and compare these two errors.
- (e) Derive the Newton Gregory backward interpolation formula and by using this find $f(3)$ from the following table:

x	:	1.0	1.5	2.0	2.5	3.5
f(x)	:	3	4	2	6	8

(f) Find the missing term in the following table:

x	:	0	1	2	3	4
y	:	5	6	9		21

(g) Show that the following system of equations is consistent and solve by using Gauss elimination method.

$$x + y + z = 11$$

$$2x - 6y - z = 0$$

$$3x + 4y - 2z = 0$$

(h) Derive the rate of convergence of regular falsi method.