



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 214201

Roll No.

--	--	--	--	--	--	--	--	--	--

MCA

(SEM. II) THEORY EXAMINATION, 2014-15
COMPUTER BASED NUMERICAL AND
STATISTICAL TECHNIQUE

Time : 3 Hours]

[Total Marks : 100

Note: Attempt All Questions. All Question carry equal marks.

Q.1 Attempt any FOUR question.

(5×4=20)

- Explain in brief how floating point numbers are stored in computers. What are the factors that affect their accuracy and range?
- Explain with the help of suitable example, show that associative law of addition may not valid in numerical computation.
- With the help of example explain how numerical solutions differ from analytical solution.
- What are the different type of error that may arise in numerical computations
- Differentiate between accuracy and precision?
- Use Muller's method to find a root of the following equation:

$$x^3 - x - 1 = 0$$

Q.2 Attempt any TWO question.

(5×4=20)

- What do you understand by numerically unstable procedure? Explain with a suitable example.
- Explain in details with example the differences between interpolation and curve fitting.
- Define rate of convergence. Obtain rate of convergence of Newton's Raphson method.?

Q.3 Attempt any TWO question.

(10×2=20)

- a. Using Euler's method, solve the following differential equation.

$$\frac{dy}{dx} + 2y = 0, \quad y(0) = 1$$

- b. Use the Runge-Kutta fourth order method to find the value of y when $x = 1$ given that $y = 1$ when $x = 0$ and that $\frac{dy}{dx} = (y - x)/(y + x)$
- c. Solve $\frac{dy}{dx} = x + y$, Given $y(1)=0$ find $y(1,1)$ by Taylor's method.

Q.4 Attempt any TWO question.

(10×2=20)

- a. Fit the curve $y = ax^b$ to the following data, using method of least squares.

$x:$	1	2	3	4	5	6
$y:$	2.98	4.26	5.21	6.1	6.8	7.5

- b. For a bi-variate distribution $n=18$,
 $\sum x^2 = 60$, $\sum y^2 = 96$, $\sum x = 12$, $\sum y = 18$, $\sum xy = 48$

Find the equations of lines of regressions.

- c. Write short notes on :

1. Quality Control Methods
2. Multiple Regression Analysis

Q.5 Attempt any TWO question.

(10×2=20)

- a. Explain in details with example Chi-Square Test.
- b. Write short notes on :
1. One-way classification
2. ANOVA Table
- c. Explain the significance of T and F-Test.