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Roll No

MCA-204**M.C.A. II Semester**

Examination, November 2018

**Computer Oriented Numerical and
Statistical Methods***Time : Three Hours**Maximum Marks : 70*

- Note:** i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Distinguish among four types of errors and explain how each can be minimized. 7
b) Find the real root of the equation: 7
 $x \log_{10} x - 1.2 = 0$
by the method of false position, correct to three decimal places.
2. a) Derive Newton's forward interpolation formula and use it to find the value of $f(1.3)$ from the following table. 7

$x :$	1	1.4	1.8	2.2
$f(x) :$	3.5	4.8	6.0	6.5

b) Evaluate : 7

$$\int_0^6 \frac{1}{1+x^2} dx$$
 - i) Using Simpson's 1/3 Rule.
 - ii) Using Weddle's Rule.

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3. a) Write down the ill-conditioned equations and refinement of solutions with example. 7
b) Apply Runge-Kutta Fourth order method to find an value of y when $x = 0.2$ in step of 0.1, given that $\frac{dy}{dx} = x + y$ and $y = 1$ when $x = 0$. 7
 4. a) Derive mean and variance of Binomial distribution. 7
b) A bag contains 9 black and 5 white balls. If 7 balls are withdrawn, find the frequency function for the number of black balls obtained: 7
 - i) If drawings are made with replacement.
 - ii) If drawings are made without replacement.
 5. a) What is mean by testing of Hypothesis? Explain the terms type I and type II error. 7
b) Find the student's t for following variable values in a sample of eight : -4, -2, -2, 0, 2, 2, 3, 3 taking the mean of the universe to be zero. 7
 6. a) Show that Newton-Raphson method is quadratic convergent. 7
b) Write short notes on the following: 7
 - i) Gauss - Legendre integration method
 - ii) Inverse Interpolation

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Contd...

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7. a) Find the solution of the system of equations: 7

$$2x + y + 4z = 12$$

$$8x - 3y + 2z = 23$$

$$4x + 11y - z = 33$$

using Gauss-Elimination Method.

- b) Prove that the mean deviation from the mean of the normal distribution is about $4/5$ times its standard deviation. 7

8. Define the following terms: 14

- i) Null and composite Hypothesis
- ii) Normal distribution
- iii) F-curve
- iv) Overflow and underflow
