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

PAPER ID : 1218 Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ]

MCA Examination 2018-2019

(Third Semester)

COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES

Time : Three Hours]   *[Maximum Marks : 100*

Note :– (i) Attempt all questions.

(ii) All questions carry equal marks.

1. Attempt any four parts :   5×4=20

(a) Let $y = 0.3456 \times 10^{-3}$, find the relative error if x is truncated to three decimal places.

(b) Find the sum of 0.523×10^4 and 0.421×10^3 and write the result in four decimal places.

(c) Discuss the different modes of graphical representation by frequency distribution.

(d) What do you mean by error. Explain truncation errors with example.

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(e) Add 0.3235E5 and 0.4364E8

(f) Find the smaller root by the equation $x^2 - 400x + 1 = 0$ using four digit arithmatic.

2. Attempt any two parts: $10 \times 2 = 20$

   (a) Use Gauss Jardon method to solve following equations:

   $$x + y + z = 6$$
   $$3x + 2y + 4z = 8$$
   $$x + 4y + 9z = 18$$

   (b) Find real root of $2x + \cos x - e^x = 0$ by false position method correct to four decimal places.

   (c) What are limitation of Newton Rapson method. Find value by $\sqrt{26}$ by this method.

3. Attempt any two parts: $10 \times 2 = 20$

   (a) Use Lagrange's interpolation method to find the value of y corresponding to $x = 10$ from following data:

x	5	6	9	11
y	12	13	14	16

(b) Evaluate the following assume 'n' as the interval.

    (i) $\Delta^2 \sin 2x$

    (ii) $\Delta \cos x$

    (iii) $\Delta^3 e^{ax+b}$

(c) Evaluate $\int_0^4 e^x dx$ by simpson's $\frac{1}{3}$ rule.

4. Attempt any two parts: $10 \times 2 = 20$

    (a) Find the solution of following by Runga Kutta method

$$\frac{dy}{dx} = x - \frac{y}{2} \; with \; y(0) = 1$$

      at $x = 1$

    (b) Evaluate $\int_0^{10} \frac{1}{1+x} dx$ using Trapezoidal rule.

    (c) Solve $\frac{dy}{dx} = 1 + 2y$ as $y\,(0) =$ in the range

      $0 \le x \le 0.3$ by Euler's method.

5. Attempt any two parts: $10 \times 2 = 20$

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(a) Describe the purpose by time series analysis to data collected over a period of time.

(b) Apply least square method for filting of curve of form $y = e^x$.

(c) What is control chart. Describe How a control chart is constructed and interpreted.

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