U-5179

M. C. A. (Sem.-II) Examination, 2021

PAPER - MCA-202

Computer Oriented Numerical Methods

Time allowed : **Three Hours**

Maximum Marks : **70**
(Min. Pass Marks : **28**)

Note : This question paper will be divided into three sections as under :

Section-A ***Max. Marks-10***

Will carry 10 marks with 01 compulsory question comprising 10 short answer type questions (Maximum 20 words answer) taking two questions from each unit. Each question shall be of one mark.

Section-B ***Max. Marks-25***

Will carry 10 questions, 02 questions from each unit (answer about in 250 words). Students are instructed to attempt five questions by selecting one question from each unit. Each question shall be of five marks.

Section-C ***Max. Marks-35***

*Will carry **35** marks with five long answer type questions comprising one compulsory question (question no. 07) of **15** marks and four questions of **10** marks each. Students are instructed to attempt total three questions will one compulsory question (answer about in 500 words) and any two more questions (answer about in 400 words) out of remaining four questions.*

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SECTION - A

1 Short answer type :

(i) Describe absolute error.

(ii) What is normalized Floating point.

(iii) Explain truncation error.

(iv) What is relative error.

(v) What is the purpose of iterative methods in numerical analysis.

(vi) Describe local error

(vii) Explain Global error.

(viii) What will be the sum 111+101 in 4 bit computer.

(ix) What will be the value of 5.6 in binary.

(x) Explain Convergence. **10**

SECTION - B

2 Add the following numbers using four bit computers [Four bit mantissa and 2 bit exponent]

$.32678 \times 10^7$

6.2356×10^4

3 Multiply the numbers

$.2361 \times 10^4$ with 6231×10^8

Write the answer in the normalized floating point using 4 bit mantissa and two bit exponent.

4 Explain Newton Raphson method.

5 What is bisection method and how it works.

6 Describe Gauss Seidel method.

7 Explain Euler method.

8 Describe interpolation with example.

9 Explain Runge Kutta Method.

10 What is Pivoting. Explain.

11 Explain extrapolation with example.

SECTION - C

12 Solve the following simultaneous equations by using Gauss Elimination method.

$2x + 3y + z = 5$

$x + 2y + 2z = 1$

$3x + y + z = 2$

13 Find the roots of the equation $f(x) = x^3 - x - 1$ by using bisection method.

14 Explain Taylor series and its derivatives

15 From the Table given below :

x	2	3	4	5	6
y	4	6	8	10	12

Find the value of y when x = 4.2 by using linear interpolation.

16 Write Short notes :

(1) Curve fitting.

(2) Trapezoidal rule.

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