

# C.U.SHAH UNIVERSITY

## Summer Examination-2019

**Subject Name : Computer Oriented Numerical Methods (CONM)**

**Subject Code : 5CS03MCN1**

**Branch: MCA**

**Semester : 3**

**Date : 11/03/2019**

**Time : 02:30 To 05:30**

**Marks : 70**

**Instructions:**

- (1) Use of Programmable calculator and any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

### SECTION – I

- Q-1      Attempt the Following questions      (07)**
- a. What is Decimal Number?      **01**
  - b. Define Floating Point Representation      **01**
  - c. Convert  $(110111)_{10} = ( \quad )_2$       **01**
  - d. Define Binary Subtraction      **01**
  - e. What is Hexa Decimal?      **01**
  - f. List out types of Error      **01**
  - g. Convert  $( 55 )_2 = ( \quad )_{10}$       **01**
- Q-2      Attempt all questions      (14)**
- a. Given that one root of the equation  $X^2 - 2X - 5 = 0$ , find the root correct to three significant digits. (Newton Raphson method)      **05**
  - b. Compute the following equation using Modify Euler's Method      **05**  
 $dy/dx = X^2 + Y^2$  where  $Y_0 = 2, X_0 = 1, h = 0.04, X = 1.2$ , Find the Value of  $Y = ?$
  - c. Describe types of Error in brief      **04**
- OR**
- Q-2      Attempt all questions      (14)**
- a. Find the value of Y Using Following Table(Y on X Curve Fitting Method)      **05**
- |   |     |     |     |     |
|---|-----|-----|-----|-----|
| X | 3   | 4   | 5   | 6   |
| Y | 1.6 | 1.9 | 2.3 | 2.5 |
- b. Given that one root of the equation  $X^3 - 4X - 5$ , find the root correct to three significant digits. (Regula-False method)      **05**
  - c. Compute the Following Table Value using Simson's 1/3 Rule with 4 interval where      **04**



$$e^{-1.2 * x}$$

the equation is

**Q-3**

**Attempt all questions**

**(14)**

- a. Find the value of Y when X = 3.5 using Langrange Interpolation Method **07**

X	25	30	40	50
Y	52	67.3	84.1	94.1

- b. Find the value of Y using following Table(Forward Difference Table) **07**

X	2	2.25	2.5	2.75	3
Y	9	10.6	11.25	12.56	14

**OR**

**Q-3**

- a. Find the value of X when Y = 0.390 using Langrange Inverse Interpolation Method **07**

X	20	25	30	35
Y	0.342	0.423	0.500	0.650

- b. Find the value of Y using following Table(Backward Difference Table) **07**

X	2.5	3	3.5	4	4.5
Y	7.75	12.45	15.70	19.52	29.57

## SECTION – II

**Q-4**

**Attempt the Following questions**

**(07)**

- a. What is Curve? **01**
- b. Define Numerical Integration **01**
- c. What mean by Ordinary Derivatives and Partial Derivatives **01**
- d. Write down a formula(equation) of Simson's 3/8 Rule **01**
- e. What is Difference Table Method? **01**
- f. Write down two types of methods of Gauss Elimination Method **01**
- g. List out Methods of Difference Table **01**

**Q-5**

**Attempt all questions**

**(14)**

- a. Compute the following equation using R – K 2<sup>nd</sup> Order Method **05**  
 $dy/dx = X^2 - Y$  where  $Y_0 = 2, X_0 = 1, h = 0.25, X = 2$ , Find the Value of Y = ?
- b. Given that one root of the equation  $X^3 - 4X - 9$ , find the root correct to two significant digits. (Bisection method) **05**
- c. Explain Simson's 3/8 Rule with an appropriate example **04**

**OR**

**Q-5**

- a. Find the value of Y Using Following Table(Fitting a Hyperbola Method) **05**

X	1.1	1.2	1.3	1.4
Y	2.1	2.2	2.3	2.4

- b. Compute the following equation using Euler's Method **05**  
 $dy/dx = X + Y$  where  $Y_0 = 1, X_0 = 0, h = 0.02, X = 0.1$ , Find the Value of Y = ?
- c. Describe Successive Approximation Method with an example **04**



- Q-6**      **Attempt all questions**      **(14)**  
a. Find the value of X Using Following Table(X on Y Curve Fitting Method)      **07**

X	3	4	5	6
Y	1.6	1.9	2.3	2.5

- b. Find out the X1,X2 and X3 using Gauss Elimination Method,      **07**

$$2X_1 + X_2 + X_3 = 10$$

$$3X_1 + 2X_2 + 3X_3 = 18$$

$$X_1 + 4X_2 + 9X_3 = 16$$

**OR**

- Q-6**      **Attempt all Questions**      **07**  
a. Find out the X1,X2 and X3 using Gauss Jordan Method,      **07**

$$2X_1 - 2X_2 + 5X_3 = 13$$

$$2X_1 + 3X_2 + 4X_3 = 20$$

$$3X_1 - X_2 - 3X_3 = 10$$

- b. Compute the Following Table Value using Trapezoidal Rule with 10 interval where      **07**

the equation is  $\int_0^1 y \, dx$

