**Enrollment No: _____ Exam Seat No:_____**

# C.U.SHAH UNIVERSITY

## Summer Examination-2020

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

**Subject Code : 5CS03MCN1** **Branch: MCA**

**Semester: 3** **Date: 25/02/2020** **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.

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## SECTION – I

**Q-1** **Attempt the Following questions** **(07)**

**a.** What is Binary Number? **01**
**b.** Define Error **01**
**c.** Convert $(10110)_{10}$ = ( )$_2$ **01**
**d.** Define Binary Division **01**
**e.** What is Decimal Number? **01**
**f.** List out types of Error **01**
**g.** Convert ( 22 )$_2$ = ( )$_{10}$ **01**

**Q-2** **Attempt all questions** **(14)**

**a.** Given that one root of the equation $X^3 - 4X - 9 = 0$ .find the root correct to three significant digits. (Bisection method) **05**
**b.** Given that one root of the equation $X^2 - 2X - 3 = 0$ .find the root correct to three significant digits. (Regula False method) **05**
**c.** Given that one root of the equation $X^3 + 2X^2 + 10X - 20 = 0$ .find the root correct to three significant digits. (Newton Raphson method) **04**

**OR**

**Q-2** **Attempt all questions** **(14)**

**a.** Explain Simson's 1/3 Rule with an appropriate example **05**
**b.** Explain Langrange Inverse InterPollation Formula **05**

**c.** Describe Successive Approximation Method with an example **04**

**Q-3** **Attempt all questions** **(14)**

**a.** Find the value of Y when X = 35 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 | 2.0 | 2.1 | 2.2 | 2.3 |
|---|---|---|---|---|
| Y | 11 | 12.26 | 13.64 | 15.16 |

## SECTION – II

**Q-4** **Attempt the Following questions** **(07)**

**a.** What is Curve Fitting? **01**

**b.** List out Methods of Numerical Integration **01**

**c.** What is Ordinary Differential Method? **01**

**d.** List out Methods of Curve Fitting **01**

**e.** What is Difference Table Method? **01**

**f.** Define Numerical Integration **01**

**g.** List out Methods of Difference Table **01**

**Q-5** **Attempt all questions** **(14)**

**a.** Compute the following equation using R – K 2nd 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.** Compute the following equation using Modify Eulor's Method **05**
$dy/dx = X + Y$ where $Y_0 = 1$, $X_0 = 0$, $h = 0.05$, $X = 0.1$, Find the Value of Y = ?

**c.** Explain R – K 4th Order Method in brief **04**

**OR**

**Q-5** **a.** Find the value of X Using Following Table(X on Y Curve Fitting Method) **05**

| X | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 |
|---|---|---|---|---|---|
| Y | 2 | 3 | 4 | 5 | 6 |

**b.** Compute the following equation using Eulor's Method **05**

dy/dx = $X^2$ + Y where $Y_0$ =1, $X_0$ =0, h=0.02, X= 0.1, Find the Value of Y = ?

**c.** Describe types of error **04**

**Q-6** **Attempt all questions** **(14)**

**a.** Find the value of Y Using Following Table(Y on X Curve Fitting Method) **07**

| X | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 |
|---|---|---|---|---|---|---|
| Y | 5.1 | 5.3 | 5.6 | 5.7 | 5.9 | 6.1 |

**b.** Compute the Following Table Value using Simson's 3/8 Rule with 4 interval where **07**

the equation is $\int_1^2 e^{-1/2 * x}$

**OR**

**Q-6** **Attempt all Questions**

**a.** Compute the following equation using R – K 4th Order Method **07**

dy/dx = $X^2$ - Y where $Y_0$ =2, $X_0$ =1, h=0.25, X= 2, Find the Value of Y = ?

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

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