C.U.SHAH UNIVERSITY
Winter Examination-2018

Subject Name: Numerical Techniques, C-programming and MATLAB
Subject Code: 5SC03NTM1   **Branch: M.Sc. (Physics)**
Semester: 3   **Date: 01/12/2018**   **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. Give statement of Empirical law   **01**
  b. Which unitary operator used to know size of structure?   **01**
  c. Give principle of least square method.   **01**
  d. What is Union?   **02**
  e. Define Structures.   **02**

Q-2   **Attempt all questions**   **(14)**
  a) Solve the following equations by gauss –Jordan method.   **06**
        $10X+Y+Z= 12$
        $2X+10Y+Z= 13$
        $X+Y+5Z= 7$
  b) Solve the following equation by Matrix Inversion method.   **06**
        $X+Y+Z=3$
        $2X-Y-Z=3$
        $X-Y+Z=9$
  c) What is pointer?   **02**

OR

Q-2   **Attempt all questions**   **(14)**
  a) Fit a parabola of the form $y= ax^2+bx+c$ to the following data by method of group   **07**
        averages.

X:	87.5	84	77.8	63.7	46.7	36.9
Y:	292	283	270	235	197	181

  b) Solve the following equation by Gaussian elimination method.   **07**
        $X+3Y+6Z=2$
        $3X-Y+4Z=9$
        $X-4Y+2Z=7$

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

a)	Solve the following systems of equations of by gauss-Seidel iteration method. 27X+6Y-Z= 85 6X+15Y+2Z= 72 X+Y+54Z= 110	**06**
b)	Explain Structure initialization in details.	**04**
c)	Explain graphical method in shorts.	**04**

<div align="center">OR</div>

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

a) By the method of least squares, find the straight line that best fits the following data: **07**

X:	0	5	10	15	20	25
Y:	12	15	17	22	24	30

b) Fit a straight line y= a+bx to the following data by the method of moments.   **04**

x	1	2	3	4
y	16	19	23	26

c) Explain initialization of pointer variables.   **03**

<div align="center">SECTION – II</div>

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

a.	Give full form of MATLAB.	**01**
b.	Give command Taylor expansion for sinx up to tenth order in MATLAB.	**02**
c.	Write program of simple X-Y plots in MATLAB.	**02**
d.	Give command for limit in MATLAB with example.	**02**

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

a)	Write a program of Newton Raphson method.	**07**
b)	Discuss" loop" command in MATLAB.	**05**
c)	Write steps for solve algebraic equation X^2-2X-4=0 in MATLAB.	**02**

<div align="center">OR</div>

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

a)	Write a program of Bisection method.	**07**
b)	How to use plots and Graphs function in MATLAB with examples.	**04**
c)	Explain sums and products with example in MATLAB.	**03**

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

a)	Write a program of Trapezoidal method.	**07**
b)	Explain in details matrices operation in MATLAB with example.	**05**
c)	How to compute Taylor series of e^x about the point x=2 in MATLAB.	**02**

<div align="center">OR</div>

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

a)	Explain in details differentiation and integration with example using MATLAB.	**05**
b)	Discuss Array operations with examples in MATLAB.	**05**
c)	What are M-Files? Discuss script M-files.	**04**