Iqra National University, Peshawar

Department of Computer Science

Summer Semester, Date:28th -Sep 2020

Final term– Examination

Course Code: **Course Title: Differential Equations**

Instructor: Engr. Latif Jan

Program: BS (CS-SE & TE) **Total Marks: 50** **Time Allowed: 4 Hours**

Note: Attempt all Questions:

Q 1: a) Define 2nd order linear homogenous/non-homogenous differential equations along with two examples? **(2+2 Marks)**

b) Solve the following 2nd order Linear homogeneous /non-homogenous differential equation? **(5+5 Marks)**

i. 16y''+24y'+9y=0
ii. y''-4y'-12y=3e^(5x)

Q 2: Solve the following IVP for the 2nd order linear equations. **(5+5+5 Marks)**

(i) 2y''+5y'+3y=0 y(0)=3 y'(0)=−4
(ii) 2y''+5y'-3y=0 y(0)=3 y'(0)= 4
(iii) y''−4y'+9y=0 y(0)=0 y'(0)=−8

Q 3: Define Laplace transform along with two examples? **(1+1 Marks)**

A. Find the Laplace transforms of the given functions. **(3+3+3 Marks)**

1. f(t) = 6e^(−5t)+e^3t+5(t^3)−9
2. g(t) = 4cos(4t)−9sin(4t)+2cos(10t)
3. h(t) = e^3t+cos(6t)−e^(3t)cos(6t)

Q4: Solve the following IVP using Laplace Transform. **(5+5 Marks)**

(i) y''−4y'=e^(3t), y(0)=0, y'(0)=0
(ii) y''+3y'+2y=e^(-t), y(0)=0 y'(0)=0