Enroll. No. ____________

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

ADITYA SILVER OAK INSTITUTE OF TECHNOLOGY

BE - SEMESTER–II • MID SEMESTER-I EXAMINATION – SUMMER 2019

SUBJECT: MATHEMATICS-2 (3110015) (ALL BRANCH)

DATE: 30-03-2019 TIME: 8:00 PM To 9:45 pm TOTAL MARKS: 40

Instructions:
1. All the questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1 (a) Find the Laplace Transform of following functions. [04]
$(i)\ f(t) = cos^3 t \quad (ii)\ f(t) = e^{-2t}(sin4t + t^2)$.

(b) Solve $(D^2 - 4D + 4)y = 2^x + log5\ , where\ D = \frac{d}{dx}$. [04]

(c) State the convolution theorem and find the Inverse Laplace transform using Convolution theorem $L^{-1}\left\{\frac{1}{(s+1)(s+2)}\right\}$. [04]

Q.2 (a) Check given differential equation is exact or not and find the general solution [03]
$(x^4 - 2xy^2 + y^4)dx - (2x^2y - 4xy^3 + siny)dy = 0$

(b) Solve the differential equation $\frac{dy}{dx} + \frac{y}{(1+x)} = \frac{y^2}{(1+x)^2}$. [04]

(c) Solve the differential equation using Laplace Transform: [07]
$y'' - 3y' + 2y = 4t + e^{3t}, y(0) = 1, y'(0) = -1$.

OR

Q.2 (a) Obtain the Inverse Laplace transform of following function $L^{-1}\left\{\log\left(\frac{s-3}{s+4}\right)\right\}$. [03]

(b) Solve the differential equation $\frac{dy}{dx} + ytanx = sin2x$, y(0)=0. [04]

(c) Find Laplace Transform of the following function [07]
$(i) f(t) = tsin3tcos2t \quad (ii) f(t) = \frac{cost - cos2t}{t}$.

Q.3 (a) Solve the differential equation $(D^3 - 2D^2 + 4D - 8)y = 0 \quad where\ D = \frac{d}{dx}$. [03]

(b) Solve $\left(\frac{dy}{dx}\right)^2 - (x^2 + x)\frac{dy}{dx} + x^3 = 0$. [04]

(c) Find out general solution of the differential equation [07]
$y'' - 6y' + 9y = \cos 2x \sin 4x$.

OR

Q.3 (a) Solve $xp^2 - 2py + 4x = 0$. [03]

(b) Using partial fraction Obtain the Inverse Laplace Transform of $\left\{\frac{4s+5}{(s+2)(s-3)(s+4)}\right\}$. [04]

(c) Solve $(D^4 - 16)y = e^{2x} + x^4, where\ D = \frac{d}{dx}$. [07]