Enrollment Number:_____

P P SAVANI UNIVERSITY
P P SAVANI SCHOOL OF ENGINEERING
4^{th} Semester of B. Tech. Examination (1^{st} Internal Exam)
Course: Mathematical Methods for Computation (SESH2051)
Branches: CE/IT

[Date:01/02/2019, Friday] [Time:10:15 A.M. to 11.15 A.M.] [Total Marks:30]

Instructions :
- Figures to the right indicate full marks.
- All questions are compulsory.
- Use of scientific calculator is allowed.
- Draw neat and clean drawings using pencil & Assume suitable data if necessary.

Q.1 Answer the following. [06]

(i) Find the order and degree of $x + y = 0$.

(ii) Find the order and degree of $(D^2 + 2(D)^{\frac{1}{3}} + 3)y = 0$.

(iii) What is the solution of Homogeneous ODE if roots of AE are $1, 2, 3, 3, \pm i$.

(iv) Write the necessary condition for a differential equation to not be an exact differential equation.

(v) Form the differential equation for $y = (A + B)x^2$

(vi) Write Bernoulli's Equation.

OR

Solve $\frac{dy}{dx} = e^{x-y} + x^2 e^{-y}$

Q.2 Answer the following. [Attempt any three]. [09]

(i) Solve $y(1 + x^2)^{\frac{1}{2}}dy + x\sqrt{1 + y^2}dx = 0$.

(ii) Solve $x(x - y)dy + y^2dx = 0$.

(iii) Solve $\left(1 + e^{\frac{x}{y}}\right)dx + e^{\frac{x}{y}}\left(1 - \frac{x}{y}\right)dy = 0$, $y(0) = 4$.

(iv) Solve $(1 + x + xy^2)dy + (y + y^3)dx = 0$.

Q.3 Answer the following. [Attempt any three]. [15]

(i) Solve $\frac{dy}{dx} = e^{x-y}(e^x - e^y)$.

(ii) Solve $r\sin\theta d\theta + (r^3 - 2r^2\cos\theta + \cos\theta)dr = 0$.

(iii) Derive C.F. for $[(D - a)^2(D^2 - 2aD + (a^2 + b^2))]y = \log(\tan x)$.

(iv) Solve $\frac{dy}{dx} + x\sin(2y) = x^3\cos^2 y$.

$\int \frac{1}{\sqrt{1+y^2}}$