STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI-86

(For candidates admitted during the year 2019-20 and thereafter)

SUBJECT CODE: 19MT/MC/DE34

B.Sc. DEGREE END SEMESTER EXAMINATION- DECEMBER 2020

COURSE: MAJOR CORE **TIME: 90 MINUTES**
PAPER: DIFFERENTIAL EQUATIONS **MAX.MARKS: 50**

SECTION – A

Answer **ALL** questions (3 × 2 = 6)

1. Define degree and order of an ordinary differential equation.
2. Find the complementary function of $(D^3 - 3D^2 + 3D - 1)y = x$.
3. Explain the method to solve type 1 standard form partial differential equations in which the variables do not occur explicitly.

SECTION – B

Answer **Any three** questions (3 × 8 = 24)

4. Solve $x^2 \frac{d^2y}{dx^2} + 3x\frac{dy}{dx} + y = \frac{1}{(1-x)^2}$
5. Obtain the procedure for solving a pair of simultaneous differential equation with constant coefficients.
6. Derive the equation that provides the shape of the hanging cable.
7. Find the general solution of $(y + z)p + (z + x)q = x + y$.

SECTION – C

Answer **only one** question (1 × 20 = 20)

8. a) Solve $y'' + 4y = 4sec2x$ by the method of variation of parameters
   b) i) Interpret the simultaneous equation $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ geometrically
   ii) Solve $\frac{dx}{bz-cy} = \frac{dy}{cx-az} = \frac{dz}{ay-bx}$ (10+2+8)

9. a) Eliminate the arbitrary function from the relation $z = (x + y)f(x^2 - y^2)$.
   b) Solve : $\left(D^2 - 5DD' - 6D'^2\right)z = ysinx + e^{2x+y}$. (8+12)