THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

MAT/MAS 2515 **Max : 75 Marks**

Differential Equations **Time : 3 hrs.**

Answer any FIVE questions :- $\mathbf{5 \times 15 = 75}$

1. Solve $\frac{dy}{dx} = \frac{x+2y-3}{2x+y-3}$.

2. Solve $p^2 + 2yp\,cotx = y^2$.

3. Solve $(D^2 - 4D + 3)$y = sin3xcos2x.

4. Solve: $\frac{d^2y}{dx^2} + y = sec\,x$ by variation of parameters.

5. Solve $p^2 + q^2 - 2px - 2qy + 1 = 0$, by Charpit's method.

6. Find the Laplace transform of $f(t) = \begin{cases} t & when\ 0 < t < b \\ 2b - t & when\ b < t < 2b \end{cases}$ $and\ f(t + 2b) = f(t)$

7. Solve the equation $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} - 3y = \sin t$ given that y = $\frac{dy}{dt}$ = 0 when t=0 using Laplace transform.

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