08PAMCE4004 PAMCE4004

M.Sc. Degree Examinations - Even Semester 2021
II Year IV Semester
Calculus of Variations and Integral Equations

Max Marks: 25

Answer any Five questions (5 * 5 = 25)

1. Derive Euler's equation to find extremal of $I(y) = \int_{x_1}^{x_2} F(x, y, y')\, dx$. Also derive the second and third forms of Euler's equations.

2. Discuss about the solution of homogeneous Fredholm equation of second kind with separable kernel.

3. Solve $y(x) = x + \int_0^{\frac{1}{2}} y(t)\, dt$ using resolvent kernel.

4. If $\emptyset$ is the solution of $\emptyset(x) = 1 - 2x - 4x^2 + \int_0^x (3 + 6(x - t) - 4(x - t)^2)\, \emptyset(t)\, dt$ then find $\emptyset(t)$.

5. Solve $y(x) = \frac{5x}{2} + \frac{1}{2} \int_0^1 x(t)\, y(t)\, dt$ using resolvent kernel.

6. Convert the differential equation $y'' + y = 0,\ y(0) = 0, y'(0) = 0$ into an integral equation.

7. Find the Eigen values and corresponding Eigen functions of $y(x) = \lambda \int_0^1 e^x\, e^t\, y(t)\, dt$.