PRESIDENCY UNIVERSITY
BENGALURU

Department of Research & Development

Mid - Term Examinations - AUGUST 2024

Odd Semester: Ph.D. Course Work

Course Code: MAT843

Course Name: Impulsive Systems with Time delays

Department: Mathematics

Date: 12-08-2024

Time: 02.00pm to 03.30pm

Max Marks: 50

Weightage: 25%

Instructions:
 (i) Read all questions carefully and answer accordingly.
 (ii) Do not write any matter on the question paper other than roll number.

PART A (THOUGHT PROVOKING)

Answer all the Questions. Each question carries 5 marks.   **(4Qx 5M= 20M)**

1. Explain Lyapunov-Razumukhin approach.

2. Explain Linear Matrix Inequality with an example.

3. State and prove the Halanay Inequality technique.

4. Explain Lyapunov-Krasovskii's approach.

PART B (PROBLEM SOLVING)

Answer all the Questions. Each question carries 10 marks.   **(3Qx 10M= 30M)**

5. Write brief notes on the classification of impulsive systems.

6. Explain finite time stability with and without impulse.

7. Prove that the existence and uniqueness solution of impulsive differential equations.