Roll No												

PRESIDENCY UNIVERSITY
BENGALURU

Department of Research & Development

Mid - Term Examinations - AUGUST 2024

Odd Semester: Ph.D. Course Work
Course Code: MAT842
Course Name: Control of Complex systems and Network
Department: Mathematics

Date: 12-08-2024
Time: 09.30am to 11.00am
Max Marks: 50
Weightage: 25%

Instructions:

(i) Read the 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 complex system and complex network of dynamical system?
2. Define convergent and semi convergent matrix along with examples?
3. Explain directed and undirected graph with examples?
4. Define consensus, min-max consensus and average consensus.

PART B (PROBLEM SOLVING)

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

5. State and prove Gershgorin disk theorem?
6. State and prove perron Frobenius theorem?
7. Explain how to define irreducible matrices and primitive matrices from the graph?