U.G. 5th Semester Examination - 2021
PHYSICS
[HONOURS]
Discipline Specific Elective (DSE)
Course Code : PHY(H)-P-DSE-1/PR
[PRACTICAL]

(Applied Dynamics)

Full Marks : 20   Time : 2 Hours

The figures in the right-hand margin indicate marks.

Write a suitable program which visualize the trajectories (using software such as Scilab, Maple, Octave, XPPAUT) for any **two** of the following problems:

1. To determine the coupling coefficient of coupled pendulums.

2. To determine the coupling coefficient of coupled oscillators.

3. To determine the coupling and damping coefficient of a damped coupled oscillator.

4. To study population models e.g. exponential growth and decay, logistic growth, species competition, predator-prey dynamics, simple genetic circuits.

[Turn over]

5. To study rate equations for chemical reactions e.g. auto catalysis, bistability.

6. Computational visualization of trajectories in the Sinai Billiard.

7. Computational visualization of trajectories Electron motion in mesoscopic conductors as a chaotic billiard problem.

8. Computational visualization of fractal formations of Fractals in nature – trees, coastlines, earthquakes.

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