

DEPARTMENT OF PHYSICS

R.C.S. COLLEGE, MANJHAUL

(A CONSTITUENT UNIT OF L.N. MITHILA UNIVERSITY, DARBHANGA)

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Ref. No.

Date 16/06/2026

Assignment-MJCPHY02

Subject: Physics

Name of the Course: - **Oscillations & Waves**

Course Code: **MJCPHY02**

Semester: **Semester-II**, Session: **2025-2029**

Answer all questions.

Q.1 Establish the equation of motion of a forced harmonic oscillator. Solve this equation to obtain the amplitude of steady state oscillations.

Q.2 Discuss the dependence of the amplitude on the angular frequency of the driving force in a forced harmonic oscillator.

Q3. The periods of oscillation of a simple pendulum at the sea level and at the top of a mountain of height 6 km are T_1 and T_2 , respectively. If the radius of earth is approximately 6000 km, then find the ratio of $\frac{T_2 - T_1}{T_1}$.

Q4. Explain superposition principle for simple harmonic oscillations.

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Assignment-MICPHY02

Subject: Physics

Name of the Course: - Oscillations & Waves

Course Code: MICPHY02

Semester: Semester-II, Session: 2025-2029

Answer all questions.

Q.1 Discuss the phenomenon of resonance and explain the factor on which the sharpness of resonance depends.

Q.2 Two collinear SHM's acting simultaneously on a particle are described by $x_1 = \sqrt{3} \cos 2\pi t$, $x_2 = \sin 2\pi t$ Find the amplitude, frequency and phase of the resultant motion.

Q.3 Two simple harmonic motions of same frequency ω but having displacements in two perpendicular directions act simultaneously on a particle: $x = a \sin (\omega t + \alpha_1)$ and $y = b \sin (\omega t + \alpha_2)$. Find the resultant motion for various values of the phase difference $\delta = \alpha_1 - \alpha_2$.

Q.4 What are Lissajous Figures? Give any two applications.

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Assignment-MDCPHY02

Subject: Physics

Name of the Course: -Crystallography

Course Code: MDCPHY02

Semester: Semester-II, Session: 2025-2029

Answer all questions.

Q.1

What are Bravais lattice? Explain it for two and three dimensions.

Q.2

Write about Ionic crystals, Covalent crystal, Metal crystal, and Hydrogen bonded crystal.

