KATWA COLLEGE

Semester -II(Hons.) Internal Assessment Examination-2023

Subject: Physics

Paper:CC-IV (Waves and Optics)

Time: 1h. F.M.-10

Answer any two questions of the following : 2x5=10

1. Two tuning forks when sounded together from 6 beats per second. They are in unison with 90 cm and 91 cm of the same wire under same tension. Find the frequencies of the forks.

A particle is simultaneously subjected to two simple harmonic motions in the same direction, each of frequency 5 Hz. If the amplitudes are 0.005 m and 0.002 m respectively and the phase difference between them is 45°, find the expression for the resultant displacement as function of time.

2. Write the equation of the wave traveling in the -x (negative x) direction and having an amplitude 0.01 m, a frequency 550 Hz and a speed 330 m/s.

If a wave is represented by the equation y=a sink(ct-x), prove that $\frac{d^2y}{dt^2}=c^2\frac{d^2y}{dx^2}$

3. Find the energy density of a progressive wave.

A transverse harmonic disturbance is produced in a string. The maximum transverse velocity is 3 m/s and the maximum transverse acceleration is 90 m/s^2. If wave velocity is 20 m/s, then find the wave form.