1. Derive the expression for the wave equation of a 1D
mechanical wave propagating on a string and show that the wave velocity is inversely proportional to the square root of
liner density of string.

2. Write the reflection and transmission coefficients of waves
at the boundary of two strings. Discuss the role of reflection
and transmission coefficients if )i P1 = Pz il) P1 < P2 i) P1>P2 lil)P2→0

3. P1>P2 lil)P2→0
a) Consider a string in a guitar whose length is 80 cm and a mass of 0.32 g with tension 80 N is plucked. Compute the linear mass density, velocity of the wave and first three
lowest frequencies produced when it is plucked.
b) Distinguish between transverse and longitudinal waves

4. Write the Maxwell equations for free space. Derive wave equations for electric and magnetic field components of the electromagnetic wave in the same medium. Show that the velocity of the wave is equal to velocity of light ni same medium.

5. a) Write the integral form of Maxwell equations and discuss their physical significances.
b) Compute curl of a vector F = 6 x + (2y - y2) /+
(6z - x3) k. What is your comment from this result.