Lesson Plan 19

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| **Title**: **Chapter 16: Waves—I** | | **Ref. No**: Week 11,  Day 1 | | |
| **Target Group/Population**: B. Sc students (CS, EEE and IPE) | | **Duration**: 90 min | | |
| **Aims/Rationale**: To give the students basic concepts of principle of superposition and interference of waves | | | | |
| **Learning Outcomes**: At the end of the session, the students will be able to understand and analyze above topics and apply those to solve related problems. | | | | |
| **Contents:** 16-5: Interference of waves (the principle of superposition for waves, interference of waves) | Method or  Technique | | Resource  or Aid | Time |
| **Introduction**:   * Welcome address * Rapport building * Review the main topics of last lecture * Importance/bridging the topic * Pre-assessment of student’s knowledge | Lecture QA | | WB  MMP | 15 min |
| **Development**:  1. Explain the principle of superposition for waves.  2. Wave functions of two sinusoidal transverse waves traveling along a stretched string are given by  *y1 (x,t) = ym sin (kx - ωt)* and *y2 (x,t) = ym sin (kx –* *ωt +* *φ)*, where *φ* is the phase difference between the interfering waves. Using the principle of superposition, find their resultant wave for different values of *φ (0, π, 2π/3)* and sketch a plot of the waves. | Lecture  Discussion QA  Problem Solving | | WB  MMP | 60 min |
| **Conclusion**:   * Quick recap/summary * Feedback from the students * References * Forward planning |  | | WB  MMP | 15 min |
| Problems:  32. What phase difference between two identical traveling waves, moving in the same direction along a stretched string, results in the combined wave having an amplitude 1.50 times that of the common amplitude of the two combining waves? Express your answer in (a) degrees, (b) radians, and (c) wavelengths. | | | | |