Problem 1: For a given function \( f \) on \([0, \pi]\). What are the odd and even extensions of \( f \)?

Problem 2: What does “\( \sum a_n \) is Abel-summable” mean?

Bonus Problem: Choose ONLY ONE of the following three problems to answer.
(a) Explain how you find the Fourier sine or cosine expansion of a given function \( f \) defined on \((0, \pi)\), using the odd and even extensions of \( f \).

(b) Let \( a_n = (-1)^n \). Is \( \sum_{n=0}^{\infty} a_n \) convergent? Is \( \sum_{n=0}^{\infty} a_n \) Abel-summable to some number? If yes, find corresponding number.

(c) Write down governing PDE for the heat equation.