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CLASSES OF L^1-CONVERGENCE OF FOURIER SERIES

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Abstract: In this paper, wider classes of Fourier cosine series are introduced and found that $a_n \log n = o(1),\ n \to \infty$ is a necessary and sufficient condition for L^1-convergence. Our results generalize the results obtained by A.N. Kolmogorov as well as R. Bala and B. Ram for cosine series while our new classes $\mathcal{JS}$ quasi convex and $\mathcal{JS}$ semi convex are the extensions of the classes quasi convex null sequence and semi convex respectively.

Keywords and Phrases: Dirichlet kernel, conjugate Dirichlet kernel, Fejer kernel, conjugate Fejer kernel, L^1- convergence.

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1. Introduction

Let

$$\frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos nx \tag{1.1}$$

be cosine trigonometric series with partial sum denoted by $S_n(x) = \frac{a_0}{2} + \sum_{k=1}^{n} a_k \cos kx$ and let $f(x) = \lim_{n\to\infty} S_n(x)$.