ES-4306

M. A./M. Sc. (Final) Special Examination, 2020

(For Private Students)

MATHEMATICS

Paper : II (Optional)

(Abstract Harmonic Analysis)

Maximum Marks : 100

Note: *Attempt all questions. Each question carries equal marks.*

1. (a) Describe Banach space of continuous function and L^P space $(1 \le P < \infty)$.

(b) Define Translate and characters.

2. (a) For any LCA group G, prove that $L'(G)$, is commulative Banach Algebra if multiplication is defined by convolution.

(b) Define locally compact Abelian group.

3. (a) If $f \in L'$ has a Fourier series that is dominatelly convergent almost everywhere, then

$$f(x) = \sum_{n \in 2} f(n) e^{inx} \text{ a.e.}$$

(b) State and prove uniqueness theorem for trigonometric polynomials.

4. (a) Let Y be any nontrival continuous complex homomorphism of L', then there exists a unique $n \in 2$ such that $Y \to Y_n$ where $Y_n(f) = f(n)$ for $f \in L'$.

(b) Prove that every bounded linear functional on L is the difference to two bounded, non negative, positive homogeneous, additive functions.

5. (a) Describe Fourier Stieltjes transform of measure and their properties.

(b) Prove that if G is discrete then $\prod$ is compact.