(3) **Pointwise Convergence:-** Let $\langle f_n \rangle$ be a sequence of measurable functions defined over a measurable set E. If there exists a measurable function f over E.

s.t $\lim_{n\to\infty} f_n(x) = f(x) \quad \forall\, x \in E$

then we say that the sequence $\langle f_n \rangle$ converges pointwise to f on E.

(4) **Convergence Almost Everywhere:—** Let $\langle f_n \rangle$ be a sequence of measurable functions defined over a measurable set E. If $\exists$ a measurable function f over E and a set A.

s.t (i) $m(A) = 0$

(ii) $\lim f_n(x) = f(x) \quad \forall\, x \in E-A$

(i.e, $\langle f_n \rangle$ converges pointwise to f on E−A)

then we say that the sequence $\langle f_n \rangle$ converges to f almost everywhere on E.

Theorems on Convergence of Sequences of Measurable Function:

(1) **Convergence in Mean:-** A sequence $\langle f_n \rangle$ of Lebesgue integrable function is said to converge in mean to a function f.

if $\lim_{n\to\infty} \int_E |f_n - f| \, dx = 0$

(2) **Convergence in measure:-** Let $\langle f_n \rangle$ be a sequence of measurable functions defined over a measurable set E. Let f be a measurable function defined over E.

s.t (i) $f(x) < \infty$ a.e. on the set E

(ii) $\lim_{n\to\infty} m\left[E(|f_n - f| \geq \epsilon)\right] = 0 \quad \forall\, \epsilon > 0$

Then the sequence $\langle f_n \rangle$ is said to converge in measure to the function f.