SWR :- The ratio of max. mags of Vtgs or currents on a line having standing waves is called standing wave ratio and denoted by S.

$$S = \frac{|E_{max}|}{|E_{min}|} = \frac{|I_{max}|}{|I_{min}|}.$$

When line is not properly terminated, standing waves are produced. Then the total power absorption cannot possible. The SWR S is measure by RF voltmeter across the line. Then ratio of E_{max} to E_{min} is obtained & refered as VSWR. Similarly ratio of I_{max} to I_{min} can be referred as current SWR (ISWR) It can be measured by RF ammeter in series. But it is impractical to measure it. Bec. we have to cut the line, measure it & then again connect the line. Hence the VSWR in general is referred as SWR. Theoretically it lies bet^n $1 \to \infty$.

* SWR bears a simple relation with mag with reflection Coefficient K.

Along the line, if reflected & incident waves are in phase and added we get Vtg maxima.

let E^+ = mag of incident
E^- = mag of reflected.

then $|E_{max}| = |E^+| + |E^-|$.

Similarly, if they are out of phase & subtracted we get.

$$|E_{min}| = |E^+| - |E^-|.$$

$$\therefore S = \frac{|E_{max}|}{|E_{min}|} = \frac{|E^+| + |E^-|}{|E^+| - |E^-|} = \frac{1 + \frac{|E^-|}{|E^+|}}{1 - \frac{|E^-|}{|E^+|}}$$