Difinition :-

An order set $S$ is called well-order if every non-empty subset of $S$ has a smallest (or first) element.

Examples. ① $S = N$ , $(N, <)$ is an order set

Let $E = \{7, 8, 9, 10\}$.

$G = \{2, 3, 4\}$.

since $G \subseteq N$ has smallest element.

$E \subseteq N$ has smallest element.

$\therefore$ $N$ is well-order.

② $S = Z$ , $(Z, <)$ an order set.

Let $E = \{\text{----}, -3, -2, -1, 0\}$

$E \subseteq Z$, but $E$ has no smallest element.

$\therefore$ $Z$ is not well-order.