BSDS QUIZ 1

Date: 14th February, 2025

You may use any result proved in class but please quote it.

(1) True or False:
   (a) if the real sequences $\{x_n\}_{n\in\mathbb{N}}$ and $\{x_n y_n\}_{n\in\mathbb{N}}$ are both bounded, then so is $\{y_n\}_{n\in\mathbb{N}}$.
   (b) if the real sequence $\{x_n y_n\}_{n\in\mathbb{N}}$ converges to 0, then one of the real sequences $\{x_n\}_{n\in\mathbb{N}}$ or $\{y_n\}_{n\in\mathbb{N}}$ converges to 0.
(2) Consider the series $\sum_{n=1}^{\infty}(-1)^{n-1}/\sqrt{n}$. Is this a convergent series? Is this an absolutely convergent series? Justify your answers.