SUGGESTED WORDINGS OF THE REQUIRED JUSTIFICATION

for Applying the Alternating Series Test

First of all, understand that you can only use the Alternating Series Test to determine that an alternating series is a CONVERGENT series. If the Alternating Series Test fails, then the series being analyzed might be convergent after all or it might be divergent. A different test will have to be used to determine which in that case.

Here, $\sum_{n=1}^{\infty} a_n$ is an alternating series and we use the notation $b_n = |a_n|$ for all n ,

so that $\sum_{n=1}^{\infty} a_n = \sum_{n=1}^{\infty} (-1)^{n+1} b_n$ or $\sum_{n=1}^{\infty} a_n = \sum_{n=1}^{\infty} (-1)^{n} b_n$

depending on whether the first term a_1 is positive (+) or negative $(-)$.

When using the Alternating Series Test to conclude that the alternating series $\sum_{n=1}^{\infty} (-1)^{n-1} b_n$ is Convergent,

you must write a justification as clear and complete as the following:

"Because (1) $b_{n+1} \leq b_n$ for all n (or for all n $\geq$ K for some positive integer K)

and (2) $\lim_{n \to \infty} b_n = 0$,

the alternating series $\sum_{n=1}^{\infty} (-1)^{n-1} b_n$ is CONVERGENT by the ALTERNATING SERIES TEST."