→ 1st term = $\frac{1}{2}$

2nd term = $\frac{-1}{2^2}$

3rd term = $\frac{+1}{2^3}$

10th term = $\frac{-1}{2^{10}}$

} Insight: every odd term will be positive and every even term is -ve

WE NEED TO FIND

$$= \frac{1}{2} + \frac{1}{2^3} + \frac{1}{2^5} + \frac{1}{2^7} + \frac{1}{2^9} - \left[\frac{1}{2^2} + \frac{1}{2^4} + \frac{1}{2^6} + \frac{1}{2^8} + \frac{1}{2^{10}}\right]$$

(taking the -ve out)

Take $\frac{1}{2}$ common outside

$$\rightarrow \frac{1}{2}\left[1 - \frac{1}{2^{10}}\right]$$ all others cancel out

$\left[1 - \frac{1}{2^{10}}\right] \Rightarrow$ this will be a little less than 1 (since $\frac{1}{2^{10}}$ will be extremely small)

However it cannot be below $\frac{1}{4}$

since $1 - \frac{1}{2^{10}}$ will not be 0.5 OR $\left[\frac{1}{2}\right]^4$ as

$\frac{1}{2^{10}}$ will be extremely small.

Thus answer is $\left[\frac{1}{4} \text{ to } \frac{1}{2}\right]$ between