The development of fuel cell technology is becoming more and more crucial to meeting the rising demand for sustainable and environmentally acceptable energy sources. Fuel cells provide an environmentally responsible way to generate electricity for short-term demands, but there is an urgent need to improve both their cost-effectiveness and environmental friendliness. The hydrogen (H_2) and oxygen (O_2) fuel cell low-efficiency out among the numerous fuel cell types because it emits no carbon and only produces water as a byproduct. To maintain extended lifecycles and low efficiency deterioratiotandn, it is essential to supply pure fuels, particularly H_2. Currently, the main method of producing significant amounts of H_2 is steam reforming of fossil fuels, which uses limited resources and produces CO= in addition to H_2. However, challenges exist in using these noble and expensive metals. In present work, we synthesized Co-WSe_2/g-C_3N_4 by facile reflux method which produce current density of 1300 mA/cm^2 in 200 Watt bulb and 1000 mA/cm^2 in room light. This formation of Co-WSe_2/g-C_3N_4 is confirmed by XRD patterns. The electrochemical parameters are studied under Potentiostat to understand the HER and OER activities in alkaline medium of 1M KOH. The deposition of nanocomposites on Ni foam is done by two methods i.e., sequential and one-pot. The comparative studies give that sequential deposition generate more current than one-pot deposition on Ni foam. The sequentially deposited nanocomposite releases hydrogen effectively with a Tafel slope of -0.10 mV and a low overpotential of -0.88 at constant 10 mA/cm2 current density. The nanocomposite's low charge transfer resistance is 3.02 Ohm/cm2, in addition. The nanocomposite's photoelectrocatalytic abilities were confirmed by the current's generation in both dark and light environments.