The emergence of bacterial resistance to antibiotics is a major issue in pharmaceuticals, creating the need to explore innovative antibacterial materials, by using nanomaterials. The current study has been designed to synthesize silver-doped zinc oxide nanocomposites using chemical co-precipitation method and tested for their antibacterial and catalytic activity. These silver-doped zinc oxide nanocomposites were characterized using UV-Visible spectroscopy and Fourier Transform Infrared Spectroscopy (FTIR). Antibacterial activity of these silver-doped zinc oxide nanocomposites and their nanoparticles, i.e., silver, zinc oxide nanoparticles for comparison, were tested against two strains, one gram-positive strain, viz: *Bacillus subtilis* and one gram-negative strain, viz: *Klebsiella pneumoniae* using agar well diffusion method. It was found that silver doped zinc oxide nanocomposites showed enhanced antibacterial activity in comparison to their nanoparticles. Zones of inhibition of silver doped zinc oxide nanocomposites were 19mm and 22mm, silver nanoparticles were 9mm and 8mm, of zinc oxide nanoparticles were 13mm and 9mm against *Bacillus subtilis* and *Klebsiella pneumoniae* respectively. The catalytic activity of silver doped zinc oxide nanocomposites, silver & zinc oxide nanoparticles was studied against Methylene blue and Congo red. Silver-doped zinc oxide nanocomposites showed enhanced catalytic activity by degradation of methylene blue and congo red dye in comparison to their nanoparticles. It is concluded that silver-doped zinc oxide nanocomposite shows enhanced antibacterial and catalytic activities than their individual nanoparticles. In-vivo analysis for the antibacterial activity of nanocomposites should be done for future applications.