In this paper, the thermodynamic modelling of exergy loss, exergy efficiency, exergy destruction rate, environmental destruction coefficient, improvement potential, exergy destruction factor, relative irreversibility, productivity lack and exergetic factor of ground source heat pump (GSHP) system are investigated. The results show that these exergy indexes should be used integratively. Compressor has the maximum exergy destruction rate, followed by the condenser and ground heat exchanger. Exergy efficiencies are obtained as 54.54% and 38.52% for the GSHP unit and whole system, respectively. Related parametric studies concerning about exergy destruction rate and exergy efficiency of the system components are carried out at different ambient temperatures.