In this study, described in detail includes a brief description of a solar based heat pump system as a heating system, concentrating on thermodynamic analysis. The main purpose of this work is to do thermodynamic analysis on performance of the heat pump system. Hydrocarbon (R600) refrigerant is selected as working fluid in this study. The heating coefficient of performance (COP) for the overall system is calculated as 3.37, while the corresponding exergy efficiency is found as 20.45%. The effect of ambient temperature on exergy efficiency is investigated for the overall system, and also has been presented as graphics.