The purpose of this study is to make energy and exergy analysis of two-stage (cascade) refrigeration system which could be reached by spending less energy at lowers temperatures without causing extreme global warming and environment pollution by using natural refrigerants. In cascade system, R-744 and R-600a refrigerants were selected for low temperature circuit and for high temperature circuit respectively. Cooling load was determined as 10 kW at the system. The temperatures were taken 40 °C at condenser side and -30° at evaporator side. The effect of sub-cooling and superheating were investigated on system performance. Energy and exergy analysis were completed by using EES software. The results were presented by tables and graphically.