In this chapter, we analyzed di erent eciencies obtained from prior based estima tion and compared it with the eciencies obtained from the optimal performances of real heat engines. We mainly point out two classes of eciencies, in the rstcategory, the leading term in the near equilibrium expansion of the eciency is c =2and in the second category, the leading term is c =3.The expression for the expected work of a quantum heat engine when eficiency is specified with one uncertain parameter (one of the energy scales) is identified similar to the expression for the work obtained from a classical Otto cycle. Hence the eciency at expected maximum work of the quantum heat engine is the CA eciency [69]. With Bayesian approach, the estimated eciency at maximum expected work of a Feynman's ratchet as a heat engine is found to be CA eciency. Surprisingly,c the coecient of performance of Feynman ratchet as a refrigeratoris also identified as the corresponding CA value for the refrigerator. The leading term in the expansion of the eciency of quantum model with two uncertain parameters is found to be c =3. The expression of this eciency is identicalto the eciency of a classical model with one uncertainparameter[113]. Anotherinteresting fact is that this eciency agrees with the eciency at the maximum 92 power of a Brownian heat engine up to the second order in near equilibrium ex-pansion. Further we estimated the performance of the heat engine when one of the energy scales, either a 1 or a 2 is specified. In this case, we proved that the leading term in the near- equilibrium expansion of the eciency at maximum expected work is one-third of Carnot value. Finally, we estimate the mean eciency from two different inferences, where in the rst case a 1 is given and in the second case a 2 is speci ed. We also show that when one of the energy scales is specied, the eciencyat expected maximum power of a Feynman's ratchet yields c =3 near equilibrium. To summarize, the eciencies obtained through Bayesian approach to uncertain parameter are categorized mainly into two classes. Further we compared these eciencies with the performance of certain nite-time models of heat engines. This similarity in the eciencies obtained by two di erent methods, is striking. The deeper connection between the two approaches needs to be investigated further