You may also answer in Finnish. Use equations to clarify your answers if necessary.

1. Describe briefly the following terms and what they are used for:

    Likelihood (1p)

    Highest posterior density interval (1p)

    Marginal distribution (1p)

    Hyperparameter (1p)

    Improper prior (1p)

    Posterior predictive distribution (1p)

2. Describe shortly the Bayesian decision analysis process (principle, terms, and steps) (3 p)

3. Explain shortly the term exchangeability, why it is useful concept and give an example. (3p)

4. MCMC convergence diagnostics

    a) What is MCMC convergence diagnostics and what is it used for? (2p)

    b) Describe problems related to convergence diagnostics. (2p)

    c) Describe the main idea in potential scale reduction convergence diagnostics. (2p)

5. Describe methods to estimate predictive accuracy of Bayesian models. (6p)