1. **Introduction to Stochastic Processes:** a. Define stochastic processes and explain their significance in modeling random phenomena. b. Describe the characteristics of a Markov process and discuss its application areas.

2. **Transition Probability and Transition Probability Matrix:** a. Define transition probability in the context of Markov processes and explain its role in modeling state transitions. b. Construct a transition probability matrix for a given Markov process with multiple states.

3. **First Order and Higher Order Markov Processes:** a. Explain the concept of a first-order Markov process and discuss how it differs from higher-order Markov processes. b. Provide an example of a first-order Markov process and illustrate its transition probabilities.

4. **n-step Transition Probabilities:** a. Define n-step transition probabilities in the context of Markov chains and explain their importance in predicting future states. b. Calculate the n-step transition probabilities for a given Markov chain with multiple states and transitions.

5. **Steady State Condition and Markov Analysis:** a. Describe the steady-state condition for a Markov chain and explain how it relates to the long-term behavior of the system. b. Conduct a Markov analysis for a specific system, including determining the steady-state probabilities and analyzing system stability.