**KIT’s College of Engineering (Empowered Autonomous), Kolhapur**

**Department of Computer Science & Engineering**

**Course Name: PE V (Natural Language Processing)**

**ISE 1 : Assignment**

1. Explain with example lifecycle phases in natural language processing.

2. Explain the different types of ambiguity in natural language. Provide examples for each.

3. What is Cross-Entropy? How is it different from entropy? Discuss its importance in training language models.

4. In your own words, explain how statistical methods are used in NLP for tasks like speech recognition or machine translation.

5. What is the significance of statistical models like n-grams in NLP? How do they model language?

6. Identify the head and morphological type (Noun Phrase, Verb Phrase, Adjective Phrase, or Adverbial Phrase) of the following sentence segment: "The tall man with a red hat."

7. What are inflectional and derivational morphemes? Provide examples of each.

8. Explain the process of morphological analysis. Why is it important for text processing in languages with rich morphology?

9. What is the difference between an inflectional morpheme and a derivational morpheme? Provide examples.

10. How does a Finite State Transducer (FST) differ from a Finite State Automaton (FSA)? Discuss its application in morphological generation.

11. Describe the steps involved in morphological analysis using Finite State Automata.

12. Discuss how finite state automata and transducers can be used to handle both inflectional and derivational morphology. Provide examples from a language of your choice.