Duration: 3hrs **[Max Marks: 80]**

N.B.: (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required, and state it clearly.

Q1a) Explain the applications of Natural Language processing. **5M**

Q1b) Illustrate the concept of tokenization and stemming in Natural Language processing. **5M**

Q1c) Discuss the challenges in part of speech tagging` . **5M**

Q1d) Describe the semantic analysis in Natural Language processing. **5M**

Q2a) Explain inflectional and derivational morphology with an example **10M**

Q2b) Illustrate the working of Porter stemmer algorithm **10M**

Q3a) Explain hidden markov model for POS based tagging. **10M**

Q3b) Demonstrate the concept of conditional Random field in NLP **10M**

Q4a) Explain the Lesk algorithm for Word Sense Disambiguation. **10M**

Q4b) Demonstrate lexical semantic analysis using an example **10M**

Q5a) Illustrate the reference phenomena for solving the pronoun problem **10M**

Q5b) Explain Anaphora Resolution using Hobbs and Cantering Algorithm **10M**

Q6a) Demonstrate the working of machine translation systems **10M**

Q6b) Explain the Information retrieval system **10M**
