

**SRI VASAVI ENGINEERING COLLEGE (Autonomous)****B.Tech. V Semester Regular Examinations November 2025****NATURAL LANGUAGE PROCESSING**

(Common to AIML)

Time: 3 Hrs

Max. Marks:70

**PART-A**

Answer All the Questions.

**20M**

1. i. Describe the purpose of a transducer in NLP.  
 ii. Define lemma and root word.  
 iii. Describe the concept of N-gram model.  
 iv. Define part-of-speech tagging.  
 v. Describe a grammar rule with an example.  
 vi. Define dependency grammar.  
 vii. Describe the concept of Semantics in NLP.  
 viii. Define synonymy with one example.  
 ix. List any two lexical resources used in NLP.  
 x. Define discourse coherence.

**20 M**
 CO1-K1(2M)  
 CO1-K1(2M)  
 CO2-K1(2M)  
 CO2-K1(2M)  
 CO3-K1(2M)  
 CO3-K1(2M)  
 CO4-K1(2M)  
 CO4-K1(2M)  
 CO5-K1(2M)  
 CO5-K1(2M)
**PART-B**

All Questions Carry Equal Marks

**50M**

2. A. i. Explain grammar-based and statistical language models with examples.  
 ii. Illustrate the morphological analysis performed by finite-state transducer with an example.

**10 M**
 CO1- K2(5M)  
 CO1- K2(5M)
**OR**

- B. i. Describe the structure of a finite state automaton and its role in language recognition.  
 ii. Explain English morphology types with suitable examples.

 CO1- K2(5M)  
 CO1- K2(5M)

3. A. i. Explain stochastic (HMM-based) POS tagging.  
 ii. Illustrate the Viterbi algorithm for HMM POS tagging.

**10 M**
 CO2- K2(5M)  
 CO2- K3(5M)
**OR**

- B. i. Describe the rule-based POS tagging with an example.  
 ii. Illustrate the Maximum Entropy models for POS tagging.

 CO2- K2(5M)  
 CO2- K3(5M)

4. A. i. Explain the components of a Context-Free Grammar with examples.  
 ii. Illustrate the top-down and bottom-up parsing strategies with examples.

**10 M**
 CO3- K2(5M)  
 CO3- K3(5M)
**OR**

- B. i. Explain how the Chomsky Normal Form (CNF) transforms CFGs.  
 ii. Illustrate the concept of dynamic programming parsing with the help of CYK algorithm.

 CO3- K2(5M)  
 CO3- K3(5M)

5. A. i. Explain the need for semantic representation in NLP.  
 ii. Illustrate the concept of Selectional restrictions and their role in semantic interpretation.

**10 M**
 CO4- K2(5M)  
 CO4- K3(5M)
**OR**

- B. i. Explain the concept of Syntax-driven Semantic analysis.  
 ii. Illustrate the supervised learning approach to Word Sense Disambiguation (WSD).

 CO4- K2(5M)  
 CO4- K3(5M)

6. A. i. Describe Hobbs' algorithm for anaphora resolution.  
 ii. Illustrate the concept of FrameNet and PropBank for semantic role labeling.

**10 M**
 CO5- K2(5M)  
 CO5- K3(5M)
**OR**

- B. i. Explain the centering theory for discourse coherence.  
 ii. Illustrate anaphora and cataphora with examples.

 CO5- K2(5M)  
 CO5- K3(5M)

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