

NATURAL LANGUAGE PROCESSING

Answer all questions, each carries 3 marks.

Marks

- 1 Explain why CFG is used to represent natural language in parsing (3)
- 2 For each sentence, identify whether the different meanings arise from structural ambiguity, semantic ambiguity or pragmatic ambiguity? (3)
1. *Time flies like an arrow*
 2. *He crushed the key to my heart*
- 3 Identify the morphological type (Noun phrase, Verb Phrase, Adjective Phrase) of following sentence segments (3)
1. *important to Bill*
 2. *looked up the tree*
- 4 Describe augmented grammar in syntactic analysis (3)

PART B

Answer any two full questions, each carries 9 marks.

- 5 Explain POS tagging with example (9)
- 6 a) Distinguish between semantics, pragmatics and discourse (5)
- b) Describe open class words and closed class words with examples (4)
- 7 a) Differentiate between different morphemes, with examples. (4)
- b) Explain lexicon, lexeme and the different types of relations that hold between lexemes (5)

PART C

Answer all questions, each carries 3 marks.

- 8 Explain the role of selectional restriction in semantic interpretation (3)
- 9 Distinguish between bounded movement and unbounded movement and give examples. (3)
- 10 Explain how ambiguity is encoded in logical form language (3)

- 11 Perform parsing using simple top down parsing for the sentence “The dogs cried” using the grammar given below: (3)

S->NP VP

NP->ART N

NP->ART ADJ N

VP->V

VP->V NP

PART D

Answer any two full questions, each carries 9 marks.

- 12 a) Map the following CFG into an equivalent RTN that uses only 3 networks- an S, NP and PP network. Make your network as small as possible. (5)

S->NP VP

VP->V | V NP | V PP

NP-> ART NP2 | NP2

NP2-> N | ADJ NP2 | NP3 PREPS

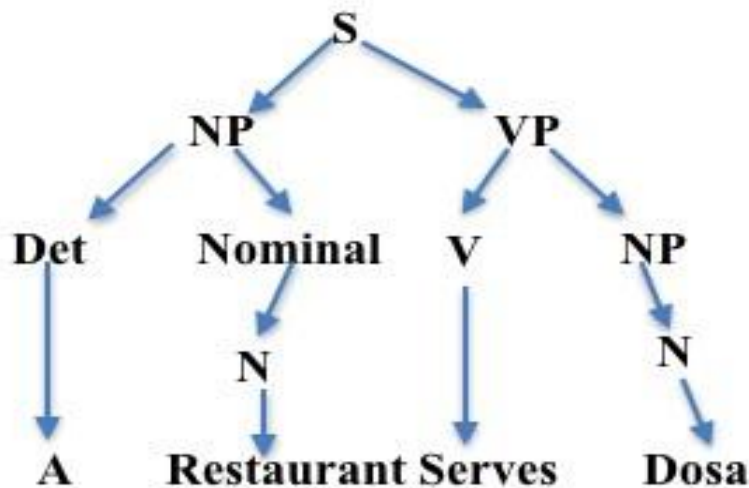
NP3-> N

PREPS->PP | PP PREPS

PP->NP

- b) Discuss the differences between ATN and RTN (4)
- 13 The parse tree for the sentence “A restaurant serves dosa” is given below. (9)

Perform semantic analysis and show the semantic interpretations of the constituents. Explain the process



- 14 a) Explain the use of modal operators in logical form language and explain how it suffer from the failure of substitutivity (5)
- b) Between the words eat and find which would you expect to be more effective in selection restriction-based sense disambiguation. Explain. (4)

PART E

Answer any four full questions, each carries 10 marks.

- 15 a) Explain the different types of inferences (5)
b) Write FOPC for the following sentences: (5)
All cats and dogs hate each other
I arrived in New York.
- 16 Explain vector space model of information retrieval (10)
- 17 a) Explain surface anaphora and the different methods for dealing with surface anaphora (5)
b) Explain the difference of discourse structure from other reference mechanisms (5)
- 18 a) Describe transfer model of Machine Translation. List out its three phases (5)
b) Explain direct machine translation (5)
- 19 Explain text summarization and multiple document text summarization with neat diagram (10)
- 20 Describe different ways of building belief models in a conversational agent (10)
