

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018**

**Course Code: CS366**

**Course Name: NATURAL LANGUAGE PROCESSING**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 3 marks.*

Marks

- |   |   |     |
|---|---|-----|
| 1 | What is Natural Language Processing? Discuss with some applications.                            | (3) |
| 2 | Analyze the usage of feature structures in NLP.   | (3) |
| 3 | State the difference between homonymy and polysemy and give an example of each                  | (3) |
| 4 | What is meant by the semantics of a natural language, and how this differs from the pragmatics? | (3) |

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**PART B**

*Answer any two full questions, each carries 9 marks.*

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|---|---|-----|
| 5 | Design a finite state transducer with E-insertion orthographic rule that parses from surface level "foxes" to lexical level "fox+N+PL" using FST. | (9) |
| 6 | a) Differentiate between top-down and bottom-up parsing.  | (3) |
|   | b) Given the following CFG grammar from ATIS System,USA.<br>Perform syntactic analysis of the following sentence using any of the parsing method. | (6) |

"Book the flight through Houston."

|                        |                                      |
|------------------------|--------------------------------------|
| S → NP VP              | Det → that   this   a   the          |
| S → Aux NP VP          | Noun → book   man   flight           |
| S → VP                 | Verb → book   include   prefer   man |
| NP → Pronoun           | Pronoun → I   she   me               |
| NP → Proper-Noun       | Proper-Noun → Houston   TWA          |
| NP → Det Nominal       | Aux → does                           |
| Nominal → Noun         | Preposition → from   to   through    |
| Nominal → Nominal Noun |                                      |

|                      |  |
|----------------------|--|
| Nominal → Nominal PP |  |
| VP → Verb            |  |
| VP → Verb NP         |  |
| VP → Verb NP PP      |  |
| VP → Verb PP         |  |
| VP → VP PP           |  |
| PP → Preposition NP  |  |

- 7 a) Explain the different levels of language analysis. (5)
- b) Identify the head and morphological type (Noun Phrase, Verb Phrase, Adjective Phrase, Adverbial Phrase) of the following sentence segments. (4)
- The president of the company
  - Looked up the chimney
  - Angry as a hippo
  - Rapidly like a bat

### PART C

*Answer all questions, each carries 3 marks.*

- 8 Describe thematic roles used in the semantic analysis with example. (3)
- 9 Define the following. (3)
- Principle of minimal attachment
  - Principle of Right Association
- 10 How the inference is done in FOPC? (3)
- 11 Identify and describe the ambiguities in the following sentences. (3)
- The man kept the dog in the house.
  - Book that flight.

### PART D

*Answer any two full questions, each carries 9 marks.*

- 12 Demonstrate ATN with a detailed example. Mention the advantage of ATN over RTN. (9)
- 13 Describe the usage of PCFG in NLP. (9)
- 14 Analyze the significance of Word Sense Disambiguation in NLP. Explain any one WSD method (9)

**PART E**

*Answer any four full questions, each carries 10 marks.*

- 15 Analyse how statistical methods can be used in machine translation (10)
- 16 Explain the architecture of an Information Retrieval system with a neat diagram. (10)
- 17 Explain the process of multi-document summarization. (10)
- 18 Describe Text Coherence. Discuss the significance of Text Coherence in Discourse Segmentation (10)
- 19 Write the FOPC representation for following sentences (10)
- i) All vegetarian restaurants serve vegetarian food.
- ii) I arrived in New York.
- iii) I ate a vegetable fried rice from Indian Coffee house.
- iv) There is restaurant near Delhi which serves Italian food.
- 20 Describe the different components of a typical conversational agent. (10)

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