

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019

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 meant by Lexicon? How is it useful in NLP?	(3)
2	Differentiate between open class and closed class of words	(3)
3	What are feature structures? How are they represented?	(3)
4	State the difference between hypernymy and hyponymy and give an example of each.	(3)

PART B

Answer any two full questions, each carries 9 marks.

- | | | |
|---|--|-----|
| 5 | a) State the advantages of bottom-up chart parser compared to top-down parsing. | (3) |
| | b) What are the 2 main classes of tagging algorithms in which they can be grouped into? Explain each one in detail | (6) |
| 6 | a) With a neat diagram describe how a typical NLP system is organised? | (5) |
| | b) Define Phonology. Illustrate the purpose of International Phonetic Alphabet in NLP. | (4) |
| 7 | Derive a top-down, depth-first, left-to-right parse tree for the given sentence: | (9) |

- The angry bear chased the frightened little squirrel

Use the following grammar rules to create the parse tree:

S → NP VP	Det → the
NP → Det Nom	Adj → little angry frightened
VP → V NP	N → squirrel bear
Nom → Adj Nom N	V → chased

PART C*Answer all questions, each carries 3 marks.*

- 8 What are the three principles that predict when garden paths will arise in syntactic interpretations of sentences? (3)
- 9 Explain the Bayes' rule on conditional probability of an event A given an event B. (3)
- 10 What are the thematic roles associated with the sentence (3)
- John broke the window with the hammer
- 11 Why is semantic interpretation assumed to be a compositional process? (3)

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

- 12 For the CFGs given: (9)

$$S \rightarrow NP VP$$

$$VP \rightarrow V NP$$

$$NP \rightarrow Det N$$

Draw the shift-reduce parser in processing the sentence

The woman saw a puppy

Use the following lexical entries to create the chart parser.

The | a: Det
 woman | puppy : N
 saw : V

- 13 a) What are the elements associated with a First Order Predicate Calculus? (6)
- b) State the difference between horizontal scoping and vertical scoping in semantic interpretation. (3)
- 14 Analyze the naive Bayes classifier approach to Word Sense Disambiguation in NLP. (9)

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

- 15 Differentiate between a dialogue and the monologue. Give relevant examples for each scenario. (10)
- 16 Explain the transfer metaphor in Machine Translation (10)
- 17 Define the following with respect to Information Retrieval:
- a) Vector Space Model (3)

- b) Term Frequency (3)
- c) Inverse Document Frequency (4)
- 18 a) What is meant by knowledge representation? (3)
- b) Describe discourse segments. (2)
- c) Briefly describe what is meant by reference resolution. (5)
- 19 a) Write the FOPC of the following sentences: (4)
- Chicken is food.
 - Either Sue is rich or she is poor
 - Bill eats peanuts and is still alive.
 - Sue eats everything Bill eats.
- b) Give any 3 different evaluation metrics available for text classification? (6)
- 20 a) Draw the transfer architecture for Machine Translation. (4)
- b) Can statistical techniques be used to perform the task of machine translation? If so, explain in brief. (6)
