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 carries3 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 carries9 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   (3)
     syntactic interpretations of sentences?

9   Explain the Bayes' rule on conditional probability of an event A given an event   (3)
     B.

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 carries9 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   (3)
          interpretation.

14   Analyze the naive Bayes classifier approach to Word Sense Disambiguation in   (9)
     NLP.

PART E
Answer any four full questions, each carries10 marks.

15   Differentiate between a dialogue and the monologue. Give relevant examples for   (10)
     each scenario.

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)

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