MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (COMPUTER SCIENCE AND ENGINEERING)

MAKE-UP EXAMINATIONS, JAN 2020

SUBJECT: NATURAL LANGUAGE PROCESSING [CSE 4011]

REVISED CREDIT SYSTEM
30-NOV-2018

Time: 3 Hours   MAX. MARKS: 50

Instructions to Candidates:

❖ Answer **ALL** questions.
❖ Missing data may be suitable assumed.

1A	Describe the different categories of Linguistic Knowledge with a neat diagram.	**4**
1B	Give the formal definition of FST. Illustrate using an example.	**4**
1C	Compute the minimum edit distance from *sitting* to *kitten* assuming equal cost for insertion, deletion & substitution operation. Show the computation using a table.	**2**
2A	Consider training data <s> the flight arrives </s> <s> the flight lands </s> <s> the truck leaves </s> (i) List all the bigrams for the training data. (ii) Show the bigram counts in the form of a table. (iii) Calculate P_{GT} (the plane) using Good-Turing discounting. (iv) Calculate all the adjusted count C*.	**5**
2B	Describe Interpolation and Backoff and give the formula used for finding probability of N-Grams respectively.	**3**
2C	How is a corpus divided into different sets and what is the purpose of each of these sets.	**2**
3A	Describe open and closed classes. Categorize the different word classes into open and closed classes. List examples for each word class. (3m)	**3**
3B	What are the uses of POS tagging a corpus?	**2**
3C	What are the limitations of Laplace smoothing? Justify why the usage of lower order estimators solve the limitations of Laplace smoothing. With mathematical expressions, discuss different techniques that make use of lower order estimators.	**5**
4A	Explain rule based POS tagging with clearly defined steps. Apply Rule based POS tagging to the sentence "He draws strange pictures. He talks strange" and formulate the elimination rule for the same.	**3**
4B	With example, discuss different categories of pronouns and their tags in Penn tag set. Give an example sentence in which a pronoun acts as a complementizer.	**3**
4C	With a suitable lexicon, state separate context free grammar rules for verb phrases with NP complement, S complement and infinitive VP compliment. Give example for a verb which can take NP compliment or infinitive VP complement.	**4**

5A	What is Chomsky Normal Form (CNF)? Give 3 rules to convert a generic CFG (Context Free Grammar) into CNF form.	**3**
5B	Briefly describe the technique of complex question answering and discuss query based summarization.	**3**
5C	Discuss morphological and syntactic differences involved in automatically performing translation between languages.	**4**

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