(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

EIGHTH SEMESTER [B.TECH] JUNE-JULY 2023

Paper Code: IT-412 **Subject: Natural Language Processing**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions in all including Q.No.1 which is compulsory.

Q1 Attempt all the parts. (5x5=25)

a) Describe the various applications of NLP.

b) What are the features and major goals of Anusaaraka system?

c) Explain different approaches to Morphology.

d) Define derived and derivation trees. Draw the derived and derivation trees for the following sentence-"The boy kicked the bucket".

e) Explain semantics, pragmatics, and discourse with suitable examples.

Q2 Explain different kinds of modified-modifier structures with suitable examples. (12.5)

Q3 Define ambiguity? Explain different kinds of ambiguities. Define the kind of ambiguity present in the following sentences.

a) Harry's feat made the Guinness world book of records.

b) Mary invited Susan for a visit, but she told him she had to go to the work.

c) Mary ate salad with Spinach from California for lunch on Tuesday.

d) John and Mary are married.

e) I saw a bat. (12.5)

Q4 a) What is LFG? Explain its basic forms in detail. (6.5)

b) Draw the structure for both forms of LFG for the following sentence.
"That kid is eating a cake". (6)

Q5 Explain the Anusaaraka system architecture in detail. How it is different from Machine Translation? What problems of Machine translation were overcome by Anusaaraka system? (12.5)

Q6 a) Explain different Machine Translation approaches along with the challenges faced by each approach. (6.5)

b) Explain all the well-formedness conditions with suitable examples. Unique, complete, Cohesion (6.5)

Q7 Explain the following-.

a) Lexical functional grammar

b) Tense aspect module

c) Tree substitution grammar (12.5)

Q8 Write **short notes** on: (12.5)

a) Componential theory of meaning

b) Truth conditional theory of meaning

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END TERM EXAMINATION

EIGHTH SEMESTER [B.TECH] MAY-JUNE-2019

Paper Code: IT-412 **Subject: Natural Language Processing**

Time : 3 Hours **Maximum Marks :75**

Note: Attempt any five questions including question no.1 which is compulsory.

Q1 (a) Write down four desirable properties for a formal language to be used for representing natural language. **(5)**

(b) Discuss the role and features of a Language Analyzer. **(5)**

(c) Define tree adjoining grammar. **(5)**

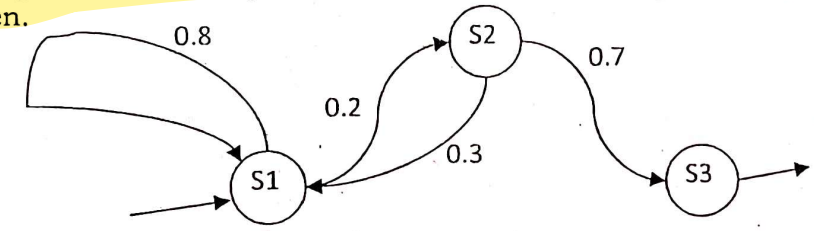
(d) List and explain 5 application of Machine Translation. **(5)**

(e) Differentiate between context free and context sensitive language. **(5)**

Q2 Discuss the advantages and disadvantages for NLP applications of grammar formalisms that use features structures compared with context free grammars. **(12.5)**

Q3 (a) Briefly define what is meant by the *semantics* of a natural language utterance, and how this differs from the *pragmatics*. **(6.25)**

(b) Write down one path that could be taken through the following Hidden Markov model that produces the output "C1 C2 C3 C4 C5" and the probability of this path being taken. **(6.25)**



State S1: Output	Probability	State S2: Output	Probability	State S3: Output	Probability
C1	0.5	C2	0.8	C4	0.5
0.5C2	0.3	C3	0.1	C5	
C3	0.2	C4	0.1		

You don't have to calculate the actual answer as a number, as long as you show the formula that would be used to calculate it.

Q4 Discuss the following with an example. **(6.25x2=12.5)**

(a) Language as rule based system.

(b) Part of speech (POS) tagging.

Q5 (a) Define Anusaraka System. Discuss about the structure and features of the system in detail. **(6.25)**

(b) What are the differences between pragmatics and discourse analysis? **(6.25)**

Q6 (a) Define Lexical function grammar. Explain the various issues in Indian languages with respect to LFG. **(6.25)**

(b) Discuss well formedness conditions during LFG formalism. **(6.25)**

Q7 (a) Write an algorithm for converting an arbitrary context-free grammar into Chomsky normal from. Explain it with a suitable example. **(6.25)**

(b) What is Chomsky normal form? What is the use of Chomsky normal form? Explain with example. **(6.25)**

Q8 Write short note on following :- **(6.25x2=12.5)**

(a) Language accesor

(b) LFG formalism

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END TERM EXAMINATION

EIGHTH SEMESTER [B.TECH] MAY-JUNE 2018

Paper Code: IT 412 **Subject: Natural Language Processing**

Time : 3 Hours **Maximum Marks :60**

Note: Attempt any five questions including Q. NO. 1 which is compulsory.

Q1. a) Define syntactic and semantic level of language understanding in NLP?
b) Explain word sense disambiguation in NLP using suitable example.
c) Explain word classes and part of speech tagging.
d) Differentiate between depth-first and breadth-first parsing. **(5x4=20)**

Q2. a) How natural language processing systems are evaluated? Explain. **(5)**
b) Differentiate between natural language processing and natural language understanding. **(5)**

Q3. a) How parsing is done with unification constraints? Explain how unification is implemented. **(5)**
b) Explain finite state morphological parsing. **(5)**

Q4. a) Discuss dependency grammar and probabilistic CFGs in natural language processing. **(5)**
b) Draw and explain shift-reduce parsing in NLP using suitable example. **(5)**

Q5. a) Explain the problem of machine translation and the challenges associated with it. **(5)**
b) How automatic text summarization is performed using NLP techniques? **(5)**

Q6. Describe the class of strings matched by the following regular expressions: **(3+3+4)**
a) [a-zA-Z]+
b) [A-Z] [a-z]*
c) \d+ (\.\d+)?

Q7. Consider the grammar G given by:

S→ε |AB | XB
T→ AB | XB
X→ AT
A→ a
B→ b

Use CYK parsing algorithm to determine the following:
a) Is w= aaabb in *L(G)*? **(5)**
b) Is w= aaabbb in *L(G)*? **(5)**

Q8. Write short notes on **(any two):** **(5+5=10)**
a) Goals of NLP
b) Semantic web search with example
c) Structure of Anusarakasytem

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