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M.Tech.

NATURAL LANGUAGE PROCESSING

SUBJECT CODE : CS - 508 (Elective - I)

Paper ID : [E0688]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 100

Instruction to Candidates:

- 1) Attempt any **Five** questions.
- 2) **All** questions carry equal marks.

Q1) Explain the different form of knowledge relevant for natural language understanding. Explain each of them using an example in terms of syntax, semantics & pragmatics.

Q2) Explain the following terms using example of each:

- Verb phrases and simple sentences.
- Five verb forms.
- Some common verbs compliment structure in English

Q3) (a) Explain the various forms of conjunctions.

(b) Write the algorithm of simple top-down parser.

Q4) Map the following context free grammar into an equivalent recursive transition network that uses only three networks- an S, NP, and PP network. Make your networks as small as possible.

S → NP VP

VP → V

VP → V NP

VP → V PP

NP → ART NP2

NP2 → NP2

NP2 → N

NP2 → ADJ NP2

NP2 → NP3 PREPS

NP3 → N

PREPS → PP

PREPS → PP PREPS

PP → NP

- Q5)** (a) Write a transducer(s) for the k insertion spelling rule in English.
(b) Write the program that takes a word and using an online dictionary, compute possible anagrams of the word, each of which is a legal word.

Q6) Consider the following CFG:

$S \rightarrow NP V$

$S \rightarrow NP AUX V$

$NP \rightarrow ART N$

Trace one of the chart parser in processing the sentence

1 The 2 man 3 is 4 laughing 5

with the lexicon entries

the: ART

man: N

is: AUX

Laughing: V

Show every step of the parse, giving the parse stack, and drawing the chart each time a non-terminal constituent is added to the chart.

Q7) Using the tagged corpus provided, write code to collect bigram and lexical statistics, and implement a part-of-speech tagger using the Viterbi algorithm test your algorithm on the same corpus. How many sentences are tagged correctly? How many category errors did this involve?

Q8) What makes dialogue different? Write automatic interpretation of dialogue act.

