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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.

