[4859]-1069

B.E. (I.T.)

NATURAL LANGUAGE PROCESSING

(2012 Pattern) (414457 E) (Elective - II) (Semester - I)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:

1) *Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.*

2) *Neat diagrams must be drawn wherever necessary.*

3) *Figures to the right indicate full marks.*

Q1) a) How Natural Language Understanding System is evaluated? **[6]**

b) Consider the following context-free grammar **[6]**

S -> NP VP N -> dog V -> sees

NP -> Det N N ->cat V -> hates

VP -> V N **->** mouse V -> sneezes

VP -> V NP Det -> the

Which of the following sentences are recognized by this grammar, and why?

i) the mouse hates

ii) the cat the mouse hates

iii) the mouse hates the mouse

c) Build an ATN for accepting the simple assertive statements like, **[8]**

The dog barked.

The cat saw Jill.

Jack saw the baboon.

OR

P.T.O.

Q2) a) Describe the flow of information in Natural Language Understanding System. **[6]**

b) Consider the following CFG: **[6]**

    S -> NP V

    S -> NP AUX V

    NP -> ART N

Trace one of the chart parsers 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.

c) Describe Unification Grammar in detail. **[8]**

Q3) a) How does Shift Reduce Parser encode uncertainty to improve the efficiency while parsing? Explain with proper example. **[9]**

b) Explain Probabilistic Context-Free Grammar in detail. **[9]**

OR

Q4) a) What are "Maximum Likelihood Estimator" and "Expected Likelihood Estimator"? How do they contribute in the prediction? **[9]**

b) How does Best-First Parsing algorithms improve the efficiency of the parser? **[9]**

Q5) a) How does the relative scoping of the quantifiers and operators add to the complexity of ambiguity in the Logical form? Justify with appropriate examples? **[8]**

b) What is WordNet? How can it help the user? **[8]**

OR

Q6) a) What is Ontology? Explain in detail.   **[8]**

b) Explain the term Semantic Ambiguity? Briefly explain any two linguistic tests to define the notion of Semantic Ambiguity.   **[8]**

Q7) a) Explain the use of BLEU metric used in assessing the quality of Machine translation?   **[8]**

b) Write a detail note on Automatic Text Clustering.   **[8]**

<div align="center">OR</div>

Q8) a) What is Semantic Web Search? How does it improve the accuracy of the search contents?   **[8]**

b) Explain the use of WER metric in Machine Translation.   **[8]**

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