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18CS743

### Seventh Semester B.E. Degree Examination, June/July 2024
## Natural Language Processing

Time: 3 hrs.                                                                     Max. Marks: 100

**Note:** *Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

**1**  a. What is NLP and explain the challenges of NLP?                                  (08 Marks)
   b. With neat illustration, explain the components of GB.                            (06 Marks)
   c. Represent the following sentence in S-structure and d-structure. "Mukesh was killed". (06 Marks)

**OR**

**2**  a. Construct the pharse structure rule for following sentence " Students of CSE like Pizza in the evening".                                                                (04 Marks)
   b. What is statistical language model and explain main approach in statistical model. (08 Marks)
   c. Explain the concept of $\overline{X}$ theory. Give VP structure for the sentence, "ate the food in a dhaba".                                                              (08 Marks)

### Module-2

**3**  a. With a neat diagram, taking appropriate example, explain two-step morphological model. (07 Marks)
   b. Give the properties of finate automation taking appropriate example to each of the properties.                                                             (03 Marks)
   c. What are the advantages and disadvantages of top down and bottom up parsing. Give top down and bottom up search space for the "Paint the door" by applying the following grammer :

   S → NP VP                    VP → Verb NP
   S → VP                       VP → Verb
    NP → Det Nominal            PP → Preposition NP
   NP → Noun                    Det → this / that / a / the
    NP → Det Noun PP            Verb → Sleeps / Paint / Open / Sings
   Nominal → Noun               Preposition → from / with / on / to
   Nominal → Noun Nominal       Pronoun → she / he / they
                                                                                 (10 Marks)

**OR**

**4**  a. Discuss at least 2 disadvantages of probabilistic context free Grammer.           (04 Marks)
   b. Explain the concept of minimum edit distance using distance equation and compute the minimum eidt distance between TUMOUR and TUTOR.                            (10 Marks)
   c. List different categories used in part of speech tagging method and explain any two in detail taking example.                                                        (06 Marks)

## Module-3

5  a. Construct a dependency graph for the sentences given below (ACE) :
   (i)   Protesters, Ceized several pumping stations, holding 127 shell workers hostage.
   (ii)  Troops recently have raided churches warning ministers to stop preaching.   (06 Marks)
   b. (i)   Give the categories of word-word dependencies taking examples.
      (ii)  Also give shortest path representation of relations.   (06 Marks)
   c. With an illustration, explain software framework for the task of learning annotate cases with knowledge rules.   (08 Marks)

### OR

6  a. What is domain knowledge in NLP and Take an example to explain the concept of information extract applications.   (04 Marks)
   b. With neat diagram, explain the concept of InFact system.   (08 Marks)
   c. Explain frame semantics and frame semantic Role labeling with example.   (08 Marks)

## Module-4

7  a. What is iSTART? Explain its 5 reading strategies.   (07 Marks)
   b. List and explain major approaches used in KDT.   (07 Marks)
   c. Explain Latent Semantic analysis feedback system.   (06 Marks)

### OR

8  a. With a neat diagram, explain the Evolutionary model for knowledge discovery from texts.   (10 Marks)
   b. List different evaluation criterions used to access hypothesis in multi objective optimization (EMOO) technique, explain any four in detail.   (10 Marks)

## Module-5

9  a. With neat diagram, explain basic information retrieval process using example.   (06 Marks)
   b. What are the two major example of statistical retrieval approach explain it with example.   (08 Marks)
   c. What is Non classical models of information retrieval, explain with an example.   (06 Marks)

### OR

10 a. What is Word Net and explain its applications in its noun "The bird built a nest of small twigs".   (08 Marks)
   b. Discuss the concept of Part of Speech tagger and explain any two part of taggers in detail.   (06 Marks)
   c. Write a note on Zipf's law.   (06 Marks)

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