

6E7108

Total No. of Questions : 22

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**6E7108**

**B.Tech. VI-Sem. ( Main/Back ) Exam. - 2024**

**ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

**6AID5-12 Natural Language Processing**

**AID, CAI**

**Time : 3 Hours**

**Maximum Marks : 70**

**Instructions to Candidates :**

**Attempt all ten questions from Part-A, five questions out of seven questions from Part-B and three questions out of five questions from Part-C.**

*Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

*(Mentioned in Form No. 205)*

[ersahilkagyan.com](http://ersahilkagyan.com)

1. ....

2. ....

**PART-A**

**[10×2=20]**

**(Answer should be given up to 25 words only)**

**All questions are compulsory**

**Q.1. Explain Natural Language Understanding.**

- Q.2. What is Stemming?
- Q.3. Define the significance of Word Vector.
- Q.4. What is Word Cloud?
- Q.5. What is Tokenization? Why is it required?
- Q.6. Describe Word Segmentation.
- Q.7. What is the significance of parsing in NLP?
- Q.8. Why we require POS tagging in NLP?
- Q.9. What are different approaches for Text Classification?
- Q.10. Explain Lexical Analysis.

**PART-B**

**[5×4=20]**

**(Analytical/Problem solving questions)**

**Attempt any five questions**

- Q.1. Explain different phases in the development of a speech recognition system.
- Q.2. What are the important tool available for the development of NLP applications? Write the feature of each of these tools.
- Q.3. Explain the algorithm to edit one string X of length n to a string Y of length m. Show the steps of your algorithms for X = INTENSYION and Y = EXECUTION.
- Q.4. Define Text Normalization. Why does text normalization important for Speech Synthesis?
- Q.5. Discuss about the problem with maximum likelihood. How does the Laplace (add-1), smoothing solve the problem?

- Q.6. Describe Word Net: Also explain the significance of Synset and Hypernyms.
- Q.7. What is Morphological Parsing? Also explain the major problems associated with morphological parsing.

**PART-C**

**[3×10=30]**

**(Descriptive/Analytical/Problem Solving/ questions)**

**Attempt any three questions**

- Q.1. Explain Probabilistic Context Free Grammar (PCFG). Also explain the probability model, problems with PCFG.
- Q.2. Describe the hard and soft clustering in context of Text Clustering. Also explain various clustering techniques used in NLP.
- Q.3. Explain in detail about Graphical Models for Sequence Labeling in NLP.
- Q.4. Describe Query Expansion Based on NLP and Word Embeddings.
- Q.5. Explain the following terms with example in detail :
- (a) Syntactic Collocations
  - (b) Term Weighting

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