

**Time:- 3 Hours****Maximum Marks: 80**

N. B.

1. Q.1 is compulsory.
2. Answer any **three** out of the remaining five questions.
3. Figures to the right indicate marks.
4. Answer to the questions should be grouped and written together.

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|---|---|-----------|
| 1 | Attempt any FOUR  | <b>20</b> |
|   | a. What are the different stages in NLP explain them briefly.   | <b>5</b>  |
|   | b. Compare semantics and pragmatics of natural language.  | <b>5</b>  |
|   | c. Describe morphemes and why are they useful?  | <b>5</b>  |
|   | d. Details the steps involved in POS tagging.   | <b>5</b>  |
|   | e. Determine the probability P (bells   the). Consider the following lines from the poem "The Bells" by Edgar Allan Poe (1849) "Keeping time, time, time, In a sort of Runic rhyme, To the joyous sound of the bells – Of the bells : Keeping time, time, time, In a sort of Runic rhyme, To the throbbing of the bells -- Of the bells, bells, bells -- To the sobbing of the bells ; Keeping time, time, time, As he knells, knells, knells, In a happy Runic rhyme, To the rolling of the bells -- Of the bells, bells, bells -- To the tolling of the bells, Of the bells, bells, bells, bells -- Bells, bells, bells -- To the moaning and the groaning of the bells." | <b>5</b>  |
| 2 | a. Describe the process of stemming and lemmatization with suitable examples.   | <b>10</b> |
|   | b. What do you understand by ambiguity in Natural Language? Explain with suitable example also discuss various ways to resolve ambiguity in NL.   | <b>10</b> |
| 3 | a. Explain measure of word as described in porter stemmer. Use it to compute the measure of following words: {tachyarrhythmia, otolaryngology, psychosynthesis, synchronicity, synonymous}  | <b>10</b> |
|   | b. Illustrate parts of speech tagging technique using Hidden Markov Model with a suitable example.  | <b>10</b> |
| 4 | a. Explain language model and describe N Gram language model in detail.   | <b>10</b> |
|   | b. Explain Word Sense Disambiguation with suitable example.   | <b>10</b> |
| 5 | a. Review the use of Cosine Distance in NLP.<br>Compute the cosine distance between the two given documents:<br>D <sub>1</sub> = This question is really very easy.<br>D <sub>2</sub> = NLP question is quite interesting and easy.   | <b>10</b> |
|   | b. Explain term-frequency and inverse document frequency (TF-IDF) with an example.  | <b>10</b> |
| 6 | a. Discuss the application of NLP for Sentiment Analysis with suitable example  | <b>10</b> |
|   | b. Write short notes on ANY two of the following:   | <b>10</b> |
|   | a. Named Entity Recognition   |           |
|   | b. Question Answer System   |           |
|   | c. Text Summarization   |           |