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Course Code	<b>22AI632</b>
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Sixth Semester B.E. Degree Examinations, June/July 2025

## NATURAL LANGUAGE PROCESSING

(Artificial Intelligence & Machine Learning)

Duration: 3 hrs

Max. Marks: 100

**Note:** 1. Answer any FIVE full questions choosing ONE full Question from each Module.  
 2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBT:CO: PI)</u>
<b><u>Module-1</u></b>			
1.	a. What is a language? Explain in detail the building blocks of language with examples.	10	(2:1:1.3.1)
	b. Explain the heuristic based approach to solve NLP problems.	05	(2:1:1.3.1)
	c. Using phrase structure grammar rules draw a parse tree for the given sentences: "The boy can kick the football".	05	(2:1:1.3.1)
(OR)			
2.	a. Explain the machine learning based approach to solve NLP problems.	10	(2:1:1.3.1)
	b. Explain the key stages in the NLP pipeline with a diagram.	10	(2:1:1.3.1)
<b><u>Module-2</u></b>			
3.	a. Compare and contrast stemming with lemmatization.	07	(2:2:1.3.1)
	b. What is n-gram model? Find the probability of the test sentence P(they play in big garden) in the following training set using bi-gram model There is a big garden Children play in the garden They play inside beautiful garden	08	(2:2:1.3.1)
	c. Explain CBOW variants of word embedding's with diagram.	05	(2:2:1.3.1)
(OR)			
4.	a. Explain the steps for text cleaning.	10	(2:2:1.3.1)
	b. Consider following training corpus and apply VSM, BoW and TF-IDF model techniques to find word2vec representation. D1- dog barks loudly D2- cat meows softly D3- dog and cat play	10	(2:2:1.3.1)
<b><u>Module-3</u></b>			
5.	a. Explain Naïve Bayes classifier and its types with code snippet.	10	(2:3:1.3.1)
	b. With code snippet explain the classification model using CNN.	10	(2:3:1.3.1)

**Note: (RBT: - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)**

**(OR)**

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| <b>6.</b> | <b>a.</b> With code snippet explain the classification model using LSTM.                                | <b>10</b> | <b>(2:3:1.3.1)</b> |
|           | <b>b.</b> What is text classification? Describe the steps to build text classification with flow chart. | <b>10</b> | <b>(2:3:1.3.1)</b> |

**Module-4**

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| <b>7.</b> | <b>a.</b> Define Information Extraction (IE)? List and explain the applications of IE. | <b>10</b> | <b>(2:4:1.3.1)</b> |
|           | <b>b.</b> With proper flow chart explain the key stages of IE.                         | <b>10</b> | <b>(2:4:1.3.1)</b> |

**(OR)**

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| <b>8.</b> | <b>a.</b> Explain in detail the use of key phrase extraction in information extraction.    | <b>07</b> | <b>(2:4:1.3.1)</b> |
|           | <b>b.</b> Explain in detail the use of named entity recognition in information extraction. | <b>08</b> | <b>(2:4:1.3.1)</b> |
|           | <b>c.</b> Explain in detail the use of relation extraction in information extraction.      | <b>05</b> | <b>(2:4:1.3.1)</b> |

**Module-5**

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| <b>9.</b> | <b>a.</b> Explain the taxonomy of Chat Bot with examples.                                   | <b>06</b> | <b>(2:5:1.3.1)</b> |
|           | <b>b.</b> Explain the pipeline for building dialog system.                                  | <b>10</b> | <b>(2:5:1.3.1)</b> |
|           | <b>c.</b> Write a brief notes of<br>(i) Dialog Act classification (ii) Response generation. | <b>04</b> | <b>(2:5:1.3.1)</b> |

**(OR)**

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| <b>10.</b> | <b>a.</b> Explain End-to-End approach for dialog generation with diagram.         | <b>10</b> | <b>(2:5:1.3.1)</b> |
|            | <b>b.</b> Explain with diagram deep reinforcement learning for dialog generation. | <b>10</b> | <b>(2:5:1.3.1)</b> |

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