

Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII EXAMINATION – SUMMER 2025

Subject Code:3170723

Date:08-05-2025

Subject Name:Natural Language Processing

Time:02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) List out the main components of NLP and briefly describe them.	03
	(b) Define NLP. Discuss three applications of NLP in real-world scenarios.	04
	(c) Describe the process of building NLP pipeline with an example.	07
Q.2	(a) Explain the concept of a Unigram Language Model. How does it differ from other N-gram models?	03
	(b) Describe the process of Part of Speech (POS) tagging and its significance in NLP.	04
	(c) Explain in detail the different smoothing techniques used in language modeling. Provide examples to illustrate their effectiveness.	07
	OR	
	(c) Explain the importance of Named Entity Recognition (NER) in NLP. How does it work, and what challenges are faced when implementing NER systems?	07
Q.3	(a) Briefly discuss one application of language modelling in NLP.	03
	(b) Explain how a bigram model predicts the next word in a sequence.	04
	(c) Discuss the concept of Word Sense Disambiguation (WSD) and the challenges involved in accurately identifying word senses.	07
	OR	
Q.3	(a) Briefly describe lexical semantics in NLP.	03
	(b) Describe the difference between knowledge-based and supervised approaches for Word Sense Disambiguation (WSD).	04
	(c) Explain in detail the skip-gram and Continuous Bag-Of-Words (CBOW) models, highlighting how they are used for training word embeddings and comparing their effectiveness.	07
Q.4	(a) Briefly describe relation extraction in NLP.	03

(b) Briefly explain the concepts of text classification and text summarization in NLP. 04

(c) Discuss the various techniques used in Sentiment Mining. 07

OR

Q.4 (a) What is the role of Named Entity Recognition in Information Extraction? 03

(b) How does question-answering work in a multilingual setting? 04

(c) Explain the concept of Cross-Lingual Information Retrieval. 07

Q.5 (a) Why is Machine Translation (MT) important in today's world? 03

(b) Briefly discuss Statistical Machine Translation (SMT). 04

(c) Explain neural machine translation with an example. 07

OR

Q.5 (a) What are some common challenges faced in Machine Translation? 03

(b) Briefly describe the Direct Machine Translation approach. 04

(c) Explain with an illustration how parameter learning in Statistical Machine Translation (SMT) is conducted. 07
