

# CBCS SCHEME

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BAD613B

**Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025**

## Natural Language Processing

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks, L: Bloom's level, C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Define NLP. List and explain application of NLP.	10	L2	CO1
	b.	Describe Paninian Framework for Indian languages. Explain layered representation of Paninian Grammar and Karkce theory.	10	L3	CO1
OR					
Q.2	a.	Explain transformational grammar with example.	10	L2	CO1
	b.	Consider the following corpus of three sentences. There is a big graden Children play in a graden They play inside beautiful garden Calculate P for the sentence "They play in a big Garden" assuming a Gram Language Model.	10	L3	CO1
Module – 2					
Q.3	a.	Explain minimum edit distance algorithm. Compute minimum edit distance between "Tutor" and "tumor".	10	L3	CO2
	b.	List POS tagging methods. Explain rule based tagger with example.	10	L2	CO2
OR					
Q.4	a.	What is morphological parsing? Explain 2-level morphological model with an example.	10	L2	CO2
	b.	Derive a top-down and bottom-up parse tree for the given sentence. "The angry bear chased the frightened little squirrel" Use the following grammar rule to create the parse tree. <div style="display: flex; justify-content: space-between;"> <div> <math>S \rightarrow NP VP</math>  <math>NP \rightarrow Det Nom</math>  <math>VP \rightarrow V NP</math>  <math>Nom \rightarrow Adj N</math> </div> <div> <math>Det \rightarrow the</math>  <math>Adj \rightarrow little/angry/frightened</math>  <math>N \rightarrow squirrel/bear</math>  <math>V \rightarrow Chased.</math> </div> </div>	10	L3	CO2
Module – 3					
Q.5	a.	Explain the working of the Naïve. Bayes classification algorithm with an example.	10	L2	CO3
	b.	Given the following short movie review, each labeled with a genre, either comedy or action. <div style="display: flex; justify-content: space-between;"> <div>Fun, couple, love, love</div> <div>comedy</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Fast couple, shoot</div> <div>action</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Couple, fly, fast, fun, fun</div> <div>comedy</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Fly, fast, shoot, fun</div> <div>action</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Fly, fast, shoot, love</div> <div>action</div> </div> And a new document D' fast, couple, shoot, fly. Compute the most likely for D. Assume a Naïve bayes classifier and use add -1 smoothing for the likelihoods.	10	L3	CO3

OR

Q.6	a.	Explain multi nominal Naive Bayes classifiers briefly.	10	L2	CO3
	b.	Write short notes on : i) Training Navie Bayes classifiers ii) Optimizing for sentiment analysis.	10	L2	CO3

Module – 4

Q.7	a.	Explain design features of IR with a neat diagram.	10	L2	CO4
	b.	Explain the cluster and fuzzy model of IR system.	10	L2	CO4

OR

Q.8	a.	List different IR models. Explain classical information retrieval model.	10	L2	CO4
	b.	Explain WordNet with its applications.	10	L2	CO4

Module – 5

Q.9	a.	What is machine translation? Explain word order typology in detail with an example.	10	L2	CO5
	b.	What is mean by the automatic evaluation? Explain the automatic evaluation of character overlap chrF.	10	L2	CO5

OR

Q.10	a.	Describe the simple encoder-decoder model and identify the attention mechanism of the given sentence "The girl liked the pink frock".	10	L2	CO5
	b.	Write a brief note on bias and word embedding models.	10	L2	CO5

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