CBCS SCHEME

USN | | | | | | | | | | **BAD613B**

Sixth Semester B.E/B.Tech. Degree Examination, Dec.2025/Jan.2026
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
1	a.	What is NLP? List and explain the application of NLP.	6	L2	CO1
	b.	Briefly explain various levels of natural language processing.	7	L2	CO1
	c.	List and explain the components of transformational grammar with an example.	7	L2	CO1
		OR			
2	a.	What is NLP? Explain the challenges of NLP.	5	L2	CO1
	b.	Describe the Statistical Language Model (SLM) – n gram model.	8	L2	CO1
	c.	Explain the concept of Add-one smoothing and Good-Turing smoothing. Calculate the smoothed count for 5, by considering that the number of n-grams that occur 4 times is 25,108 and the number of n-grams that occur 5 times is 20,542.	7	L3	CO1
		Module – 2			
3	a.	Define a finite automation that accepts the following language (aa)* (bb)*.	4	L1	CO2
	b.	Compute the minimum edit distance between tutor and tumour.	7	L3	CO2
	c.	What is parsing? List and explain the different ways of word formation.	9	L2	CO2
		OR			
4	a.	Write the regular expression for an email address. List and explain with example the use of square brackets.	5	L3	CO2
	b.	What is Morphological parsing? List and explain briefly the classes of morphemes.	6	L2	CO2
	c.	Write short notes on : i) Rule based Tagger ii) Stochastic Tagger iii) CYK Parser.	9	L2	CO2

		Module – 3			
5	a.	Describe the Naïve Bayes algorithm.	2	L1	CO3
	b.	Derive the Naïve Bayes classifier equation.	8	L2	CO3
	c.	Test the following miniature training and test document from actual movie reviews using naïve Bayes with add-one smoothing.	10	L3	CO3

cat		Documents
Training	–	Just plain boring
	–	Entirely predictable and lacks energy
	–	No surprises and very few laughs
	+	Very powerful
	+	The most fun film of the summer
Test	?	Predictable with no fun

		OR			
6	a.	Write an algorithm of Navie Bayes using add – 1 smoothing.	7	L3	CO3
	b.	With an example, explain binarization for the binary Naïve Bayes algorithm.	6	L2	CO3
	c.	Explain the Naïve Bayes as a language model. Illustrate the higher probability model for the following data set.	7	L3	CO3

w	P(wl +)	P(wl –)
I	0.1	0.2
Love	0.1	0.001
This	0.01	0.01
Fun	0.05	0.005
film	0.1	0.1

CMRIT LIBRARY
BANGALORE - 560 037

		Module – 4			
7	a.	With a neat diagram, explain the basic information retrieval process.	6	L2	CO4
	b.	List the different classical information retrieval models. And explain any one briefly.	8	L2	CO4
	c.	How does stemming affect the performance of an IR system? And what are the benefits of eliminating stop words.	6	L2	CO4
		OR			
8	a.	List the different alternative models of IR. And explain any one briefly.	8	L2	CO4
	b.	Write short notes on : i) WORDNET ii) FrameNet iii)STEMMERS.	12	L2	CO4

		Module – 5			
9	a.	Define Machine Translation. And explain the concept of : i) Word order typology ii) Lexical divergences iii) Morphological typology.	**10**	**L2**	**CO5**
	b.	With neat diagram, explain encode-decoder architecture.	**10**	**L2**	**CO5**
		OR			
10	a.	List and explain the dimensions used to evaluate the transactions. And explain the Automatic Evaluation by Character Overlap (ChrF).	**10**	**L2**	**CO5**
	b.	Describe the bias and Ethical issues of machine translation.	**10**	**L2**	**CO5**

* * * * *

CMRIT LIBRARY
BANGALORE - 560 037

VTU-30-12-2025 01:12:47pm - CR - CR - CR - CR - CR - CR - CR - CR
30-12-2025 01:33:52pm - CR - CR - CR - CR - CR - CR - CR - CR