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(w| +)	P(w| –)
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

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

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