PCE LIBRARY BANGALORE-49

CBCS SCHEME

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BAD613B

Sixth Semester B.E./B.Tech. Degree Examination, June / July 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
Q.1	a.	Define Natural Language Processing. What are the challenges of NLP?	08	L1	CO1
	b.	Illustrate with suitable examples the different levels in Natural Language Processing.	08	L2	CO1
	c.	Calculate the smoothed count for 5, by consider that the number of n – grams that occur 4 times in 25,108 and the number of n – grams that occur 5 times is 20,542.	04	L3	CO1
		OR			
Q.2	a.	List and explain the components of transformational grammar with the help of an example.	07	L2	CO1
	b.	List the problems associated with N – gram model. Explain how these problems are handled.	07	L2	CO1
	c.	List and explain the applications of NLP.	06	L2	CO1
		Module – 2			
Q.3	a.	What is morphological parsing? List and explain the classes or morphemes.	07	L2	CO2
	b.	Explain Top – down and Bottom – up parsing with example.	07	L2	CO2
	c.	For the given Context Free Grammar (CFG) S → AB/BC A → BA/a B → CC/b C → AB/a Check whether the string (w) = 'aabab' is valid or not.	06	L3	CO2
		OR			
Q.4	a.	Write CYK Algorithm for CFG.	05	L3	CO2
	b.	i) Compute the minimum edit distance between tutor and tamour. ii) Compute the minimum edit distance between "azcde' and "abcdef".	08	L3	CO2
	c.	Illustrate Spelling Error Detection and Correction in word level analysis.	07	L2	CO2

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Module – 3

Q.5	**a.**	Explain working of Naive Bayes Algorithm using add – 1 smoothing.	**10**	**L3**	**CO3**
	b.	Compute the probabilities for the following trained dataset by using the Naïve Bayes with add – one smoothing use a sentiment analysis domain with the two classes positive (+) and negative (-) and take the following miniature training and test documents simplified from actual movie reviews.	**10**	**L3**	**CO3**

	Cat	Documents
Testing	-	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

Q.6	**a.**	List the different types language model using Naïve Bayes. Explain any one briefly.	**06**	**L2**	**CO3**
	b.	With an example explain binarization for the binary Naïve Bayes algorithm.	**08**	**L3**	**CO3**
	c.	How can you use Naïve Bayes for a variety of text classification tasks?	**06**	**L2**	**CO3**

Module – 4

Q.7	**a.**	With a neat diagram, explain the basic information retrieval process.	**05**	**L2**	**CO4**
	b.	With an example, explain the Boolean and vector space model of information retrieval.	**10**	**L2**	**CO4**
	c.	How stemming affects the performance of the IR system?	**05**	**L2**	**CO5**

OR

Q.8	**a.**	Explain the fuzzy model in IR with a suitable example.	**10**	**L2**	**CO4**
	b.	Write a short notes on : i) Indexing ii) LSIM model	**10**	**L2**	**CO4**

Module – 5

Q.9	**a.**	Explain Lexical Divergences in MT.	**08**	**L2**	**CO5**
	b.	With a neat diagram, explain the Encoder – Decoder model in Machine Translation (MT).	**12**	**L2**	**CO5**

OR

Q.10	**a.**	Explain automatic evaluation in various forms. List out ethical issues raised in Machine Translation (MT).	**10**	**L2**	**CO5**
	b.	List and explain the dimensions used to evaluate the translations. And explain the automatic evaluation by character overlap (ChrF).	**10**	**L2**	**CO5**

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