ROLL NO:										

ANNA UNIVERSITY

B.E(FT)ENDSEMESTEREXAMINATIONS –DEC/JAN2024

COMPUTER SCIENCE AND ENGINEERING

CS6030-NATURAL LANGUAGE PROCESSING

(Regulation2018 -RUSA)

Time: 3 hrs Max. Marks 100

CO1	To understand basics of linguistics and probability and statistics
CO2	To study concept of morphology, syntax, semantics and pragmatics
CO3	To learn various machine learning techniques used in NLP
CO4	To understand statistical approaches to machine translation
CO5	To understand deep learning for NLP

BL- Bloom's Taxonomy Levels

(L1-Remembering, L2- Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART-A (10*2=20 Marks)

(Answer all Questions)

Q.NO	Questions	Marks	CO	BL
1.	Distinguish: Lexical Semantics vs. Computational Semantics.	2	2	2
2.	Distinguish: Phonology and Morphology?	2	1	2
3.	Define: Cross Entropy	2	3	1
4.	Give example statements for Pragmatic Ambiguity.	2	2	3
5.	Draw the block diagram for N-gram Topic Modelling.	2	2	3
6.	Define: Transducers	2	4	1
7.	How is Bag-of-words model useful in Machine Translation?	2	4	2
8.	State how is parsing & NER helpful in improving Extractive summarization performance	2	4	2
9.	Identify the Morphological Type:	2	2	3

	1. Time flies like an arrow 2. Looked Up the Tree			
10.	What is LSI?	2	1	1

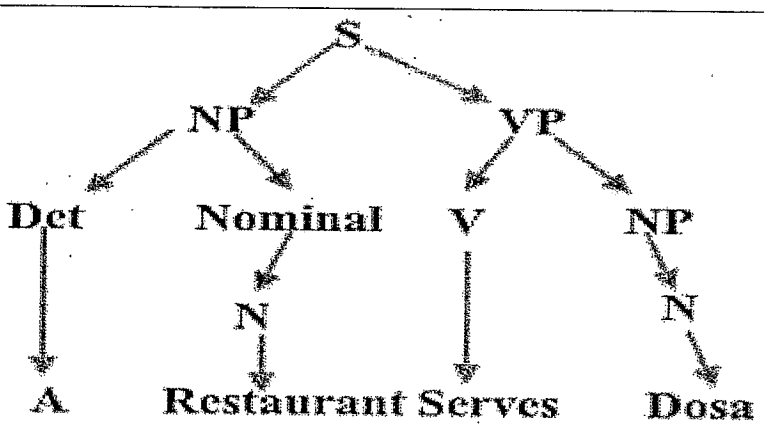
PART –B(8x8=64marks) (Answer any 8 questions)

Q.NO	Questions	Marks	CO	BL
11.	Write short notes on statistical parsing, using relevant examples.	8	2	2
12.	Explain Vector Space Model with neat illustrated example.	8	4	2
13.	For the following story, represent the computational and lexical semantics. (Hint: Change dialogues to non-dialogue statements and proceed. The story should be derivable on its own by following the computational lexical semantics.) Once, a hare saw a tortoise walking slowly with a heavy shell on his back. The hare was very proud of himself and he asked the tortoise. "Shall we have a race?" The tortoise agreed. They started the running race. The hare ran very fast. But the tortoise walked very slowly. The proud hair rested under a tree and soon slept off. But the tortoise walked very fast, slowly and steadily and reached the goal. At last, the tortoise won the race.	8	3	3
14.	Explain and Show examples for distinguishing Information Extraction vs. Information Retrieval.	8	4	4
15.	Explain Lexicon, Lexeme and the different types of relations that hold between lexemes.	8	2	3
16.	Draw ambiguous parse trees for "I saw a man with a telescope" and "I saw a man with a telescope on the boat". Explain the ambiguity.	8	1	4
17.	Derive a top-down, depth-first, left-to-right parse tree for the	8		3

	given sentence: • The angry bear chased the frightened little squirrel Use the following grammar rules to create the parse tree: S → NP VP | Det → the NP → Det Nom | Adj→ little | angry | frightened VP → V NP | N → squirrel | bear Nom →Adj Nom | N | V → chased			
18.	(i) Discuss with suitable examples, positive and negative entropy. (ii) Discuss the significance of using '-' sign in calculating entropy.	8	2	2
19.	Discuss ways of using word embedding using pre-trained Language Model? Justify.	8	5	2
20.	State & Explain any 3 different evaluation metrics available for Text Classification	8	4	2
21.	Explain how HMM are useful in temporal pattern recognition. Use necessary illustrations	8	4	3
22.	Discuss & explain the architecture & pseudo-code of n-gram topic model which is useful in detecting n-gram topics.	8	2	3

(PART–C(2x8=16marks)

Q.NO	Questions	Marks	CO	BL
23.	The parse tree for the sentence "A restaurant serves dosa" is given below. Perform semantic analysis and show the semantic interpretations of the constituents. Explain the process.	8	2	5

				
24.	**(a)** Describe Text Coherence. Discuss the significance of Text Coherence inDiscourse Segmentation **(b)** With the neat diagram explain the evolutionary model for KDT (KnowledgeDiscovery from Text).	8	4	4