Reg. No.															

Question Paper Code	13528

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Fifth Semester

Artificial Intelligence and Data Science

20AIPC503 - NATURAL LANGUAGE PROCESSING AND CHAT BOT

Regulations - 2020

Duration: 3 Hours Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Choose from the following areas where NLP can be useful. (a) Automatic Text Summarization (b) Automatic Question-Answering Systems (c) Information Retrieval (d) All of the mentioned	1	K1	CO1
2.	What NLP application is used to extract information such as names, organizations, and locations from a given text? (a) Sentiment Analysis (b) Named entity recognition (c) Machine translation (d) Text summarization	1	K1	CO1
3.	State the purpose of word embedding's in natural language processing. (a) To represent words as numerical vectors (b) To identify the tone or emotion expressed in a text (c) To identify and categorize named entities in a text (d) To generate new text based on input	1	K1	CO2
4.	What does distributional semantics aim to capture? (a) Syntactic structure of sentences (b) The frequency of words in sentences document (c) Word meanings based on their distributional patterns in a large corpus (d) Named entities in a given text	1	K1	CO2
5.	What does a non terminal symbol represent in the context of Context-free Grammar? (a) A symbol that cannot be expanded further. (b) A symbol that can be replaced sequence of terminal by symbols (c) A punctuation mark (d) A reserved keyword		K1	CO3
6.	What do the probabilities associated with different parses indicate in probabilistic parsing? (a) Execution time (b) Likelihood of a parse being correct (c) Number of rules in the (d) Length of the parse tree grammar	1	K1	CO3
7.	Which aspect of language does lexical semantics primarily focus on? (a) The grammatical structure sentences (b) The interpretation and of sentences meaning of individual words (c) The emotional tone conveyed in a text (d) The syntactic relationships between Words	1	K1	CO4
8.	Show the main challenge in word sense disambiguation. (a) Limited availability of annotated training data (b) Ambiguity only exists in rare cases (c) Easy application due to well-defined Word senses (d) Context doesn't play a significant role in disambiguation.	1	K1	CO4
9.	Outline the key limitation of rule-based machine translation (RBMT) systems. (a) Dependency on large parallel corpora (b) Limited ability to handle syntax and semantics (c) Inability to adapt to new language pairs (d) High computational complexity	1	K1	CO5

10.	Which NLG task is concerned with converting structured data into natural language text? (a) Speech Recognition (b) Information Retrieval (c) Data-to-Text Generation (d) Co reference Resolution	*1*	*K1*	*CO6*

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Which NLP application is utilized in this chatbot?	2	*K1*	*CO1*
12.	List some applications of language modeling.	2	*K1*	*CO1*
13.	List the steps required to implement the bag of words algorithm	2	*K2*	*CO2*
14.	State about vector space models are applied in representing semantic analysis in NLP.	2	*K1*	*CO2*
15.	Define context-free grammar (CFG).	2	*K1*	*CO3*
16.	Compare lexicalized and probabilistic parsing.	2	*K2*	*CO3*
17.	Analyze the significance of lexical analysis.	2	*K4*	*CO4*
18.	Summarize why WSD is essential for language processing tasks.	2	*K2*	*CO4*
19.	Outline two characteristics of Indian languages that make machine translation challenging.	2	*K2*	*CO5*
20.	Explain how the transformer model has enhanced translation performance.	2	*K2*	*CO5*
21.	Analyze about conversational flow & design in chatbot framework.	2	*K4*	*CO6*
22.	List some of the applications of NLG.	2	*K1*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Discuss the need for text normalization in NLP. Explain the various steps involved in text normalization.	*11*	*K2*	*CO1*
		OR			
	b)	Illustrate the significance of Markov assumption in N-gram language modeling.	*11*	*K2*	*CO1*
24.	a)	Identify the concept of semantic analysis and discuss the different semantic relationships between words.	*11*	*K3*	*CO2*
		OR			
	b)	Apply the concepts of ambiguity and word sense disambiguation to explain their significance in natural language processing.	*11*	*K3*	*CO2*
25.	a)	Utilize the concept of morphological parsing to describe its process and significance.	*11*	*K3*	*CO3*
		OR			
	b)	Solve the key aspects of probabilistic parsing and provide short notes on its concepts and applications.	*11*	*K3*	*CO3*
26.	a)	Elaborate on the meaning and representation aspects of semantic analysis.	*11*	*K3*	*CO4*
		OR			
	b)	Estimate the significance of discourse coherence and structure by explaining them in detail.	*11*	*K3*	*CO4*
27.	a)	Determine the key aspects of the case studies on: (i) Sentiment Analysis (ii) Machine Translation by writing a brief note on each.	*11*	*K3*	*CO5*
		OR			

	b)	Evaluate the approaches of Rule-based Machine Translation (RBMT) and Neural Machine Translation (NMT) in the context of translating Indian languages by comparing and contrasting their methodologies.	*11*	*K3*	*CO5*
28.	a)	Classify the key components of the architecture of Natural Language Generation (NLG) systems.	*11*	*K4*	*CO6*
		OR			
	b)	Examine the role of Popular chat bot frameworks available today with examples.	*11*	*K4*	*CO6*