06/01/2023

Reg. No. | | | | | | | | | | | |

| Question Paper Code | 11572 |
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022**

Fifth Semester

**Artificial Intelligence and Data Science**

# 20AIPC503 - NATURAL LANGUAGE PROCESSING AND CHAT BOT

(Regulations 2020)

Duration: 3 Hours — Max. Marks: 100

## PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

*Marks, K-Level, CO*

1. Give the tri-gram of the statement "Sachin Tendulkar is the God of Cricket and Rahul Dravid is the Wall of India". *2,K2,CO1*
2. List the applications of language modeling. *2,K1,CO2*
3. What is BoW model? List the steps to create BoW model for text data. *2,K2,CO3*
4. Define word sense disambiguation. Mention its need. *2,K2,CO3*
5. Differentiate lexicalized and probabilistic parsing. *2,K2,CO4*
6. What is the need of semantic analysis? *2,K2,CO4*
7. Why machine translation is required in Natural language processing? *2,K2,CO5*
8. Differentiate word order and word sense in machine translation. *2,K2,CO5*
9. Define conversational flow. *2,K1,CO6*
10. What is Alexa? List its features. *2,K2,CO6*

## PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) (i) Write short note on Language modeling with an example. *5,K2,CO1*

(ii) Suppose if a mobile manufacturing company wish to create an application which can recognize the speech commands to make a call, make a text message, etc. Design a language model to create such application. *8,K3,CO2*

**OR**

b) (i) What is the need of Kneser Ney algorithm? Write about it with necessary mathematical equations. *5,K2,CO1*

(ii) Consider Indian government wish to understand the likelihood of new policy announced among the citizens by analyzing the social media data. Design a language model to perform the sentiment analysis on such social media contents. *8,K3,CO2*

12. a) What is feature extraction? Explain in detail about how the various *13, K2,CO3*

*K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create* **11572** feature model can extract the features from the paragraph text.

**OR**

b) What is word sense disambiguation? Explain the simplified LESK algorithm with clear examples. 13,K2,CO3

13. a) How to use Context free grammar to define any language? Explain in detail about it with the parsing steps for CFG. 13,K2,CO3

**OR**

b) How to relate the performance of Information retrieval system with respect to the word sense disambiguation? Explain in detail. 13,K2,CO3

14. a) What is machine translation? Explain the approaches to do machine translation. Also compare Direct and Rule based machine translation. 13,K2,CO5

**OR**

b) Draw the encoder–decoder architecture and explain their components. Explain the process of RNN version for the encoder-decoder approach. 13,K2,CO

15. a) (i) Illustrate Chatbot framework and architecture in detail. Also enumerate the need of Chatbot in real time applications. 7,K2,CO6

(ii) What is a RASA channel? Also write short note on any two channels with its features and drawbacks. 6,K2,CO6

**OR**

b) (i) Explain about Conversational flow and design for the chatbot framework. 7,K2,CO6

(ii) Write short note on any two popular chatbot framework with its features. 6,K2,CO6

**PART - C (1 × 15 = 15 Marks)**

16. a) Compare and contrast the Binning model and Continuous Binning models for extracting the features from the text data. Explain in detail with examples. 15,K2,CO3

**OR**

b) Compare the knowledge based and Statistical machine translation approach. Also elucidate how these approaches can be used to translate the text from English to German or German to English. 15,K2,CO5