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Department of Artificial Intelligence and Machine Learning

Date: 05.06.2025	**Test -2**	**Max. Marks: 50+10**
Semester: VI	**UG**	**Duration: 1 $\frac{1}{2}$ Hrs + ½ Hr**
Course Title: Natural Language Processing and Transformers		**Course Code: AI363IA**

Part A

Sl No	Questions	M	BT	CO
1.	Which combined POS tagger is expected to yield higher accuracy: one that uses unigram, bigram, and trigram taggers, or another that uses unigram, bigram, trigram, and quad gram taggers? Justify your answer in one line.	2	4	1
2.	What is the purpose of feature templates in BRILL -based tagging?	2	2	1
3.	Write a Python function to implement a default POS tagger with a specified default tag as **Noun(NN)**	2	3	2
4.	What is Transformation-Based Learning (TBL) in POS tagging?	2	2	1
5.	What does the following Hugging Face code return? from transformers import pipeline pipe = pipeline("text-classification") pipe("This course is amazing!")	2	2	3

Part B

Sl No	Questions	M	BT	CO
1.a	How does a unigram POS tagger work? Illustrate with an example.	5	4	2
1.b	You are designing a Chabot that needs to understand long user queries quickly and respond efficiently Which architecture would you choose: An Encoder-Decoder model with RNNs and attention mechanism or a Transformer based model? Justify your answer with necessary block diagram	5	3	3
2.a	Differentiate between Hidden Markov Model (HMM)-based taggers and Maximum Entropy (ME) taggers.	5	4	1
2.b	Write a simple **NLTK-based Python program** that: 1.Uses a **regular expression tagger** to assign POS tags based on suffix patterns. 2.Uses Backoff to a **default tagger** (e.g., tag everything as `NN`) when no pattern matches.Apply it to the sentence: " Kohli was angrily smashing and dancing while fielders were sleepwalking."	5	2	3

3.a	Write Python code to: 1.Train a **custom classifier-based POS tagger** using Classifier Based POS Tagger from NLTK. 2.Do not use the default classifier — instead, define and pass a custom one (e.g., NaiveBayesClassifier from nltk.classify).Train on train_sents and evaluate on test_sents.	5	3	5
3.b	**Write Python code to perform the below task.**Use the backoff_tagger() function to create a chain tagging system(Default Tagger, Unigram, Bigram and Trigram Tagger).Train it using train_sents and evaluate it using test_sents.and print the accuracy	5	2	5
4.a	Explain the Brill tager with neat block diagaram	5	2	1
4.b	Imagine you're building an **auto-commentator for cricket**. You want it to guess what role a word usually plays—for example how the word *"run"* is most often used as a **noun** in match reports. Write a function that builds a model for the **200 most common words** in your cricket corpus, assigning the **most frequent POS tag** seen with each word.	5	3	5
5	List and explain any five applications of Transformers in Natural Language Processing (NLP). For each application, provide a brief description and a code snippet using Hugging Face Transformers that demonstrates how the task is performed.	10	3	5