Code No: 157HH **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, February - 2025

NATURAL LANGUAGE PROCESSING

(Common to CSBS, CSE(DS))

Time: 3 Hours **Max.Marks:75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	What are root words?	[2]
b)	What tools are commonly used for document structure analysis?	[3]
c)	Define hierarchical structuring in documents.	[2]
d)	State the role of parse trees in syntactic analysis.	[3]
e)	Define Semantic Role Labeling (SRL).	[2]
f)	List the strengths and weaknesses of semantic parsing.	[3]
g)	What is an argument in linguistics?	[2]
h)	List the role of Predicate-Argument in NLP.	[3]
i)	What is reference resolution?	[2]
j)	Define cohesion and its importance in discourse analysis.	[3]

PART – B

(50 Marks)

2.a) Design a pipeline for segmenting and labeling sections of a document based on its structure.
b) Propose a computational approach to handle complex morphological structures in highly inflected languages. [5+5]

OR

3.a) Explain the major challenges to analyzing the structure of words across different languages.
b) Discuss the challenges in constructing treebanks for low-resource languages. [5+5]

4.a) Explain the Universal Dependencies (UD) framework and its relevance in multilingual tree banking.
b) Discuss the primary components of a word in linguistic morphology. Provide examples to justify the answer. [5+5]

OR

5.a) Describe the process of ambiguity resolution in parsing. What strategies can be employed to handle ambiguities in natural language?
b) Explain the concept of Context-Free Grammar (CFG). How it facilitate parsing in NLP? [5+5]

6.a) Discuss the challenges of domain adaptation in semantic parsing systems.
b) Design a framework for handling idiomatic expressions during semantic interpretation. [5+5]

OR

7.a) Explain how semantic parsing improves the performance of a question-answering system.
b) Discuss the ethical implications of bias in semantic parsing software and how it can be mitigated. [5+5]

8.a) Discuss the role of cloud-based NLP APIs in deploying semantic parsing solutions.
b) Evaluate the challenges of integrating semantic parsing software into real-world applications. [5+5]

OR

9.a) Discuss the importance of pre-trained models in semantic parsing software.
b) Explain different types of meaning representation systems. [5+5]

10.a) Describe the role of anaphora in discourse processing. How does it affect reference resolution?
b) Describe the process of language model evaluation. What metrics are commonly used? [5+5]

OR

11.a) Discuss language-specific modeling problems that can arise in NLP tasks. Provide an example for clarity.
b) Design an N-gram language model for a small corpus. Describe the preprocessing steps, model training, and evaluation. [5+5]

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