

GYANMANJARI INNOVATIVE UNIVERSITY

GYANMANJARI INSTITUTE OF TECHNOLOGY
M.Tech.-Mid Semester Examination (MSE)-S2026

Enrollment No.: _____

Subject Code: METAI12514

Subject Name: Natural Language Processing

Time: 10:30 AM To 12:30 PM

Date: 25-03-2026

Semester: 02

Total Marks: 60

Instructions:

1. Question No. 1 is compulsory.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	Marks
Q.1 (a) Define Natural Language Processing and explain its major applications.	10
(b) Discuss the ambiguity problem in natural language and explain how machine learning helps resolve different types of ambiguity in NLP systems.	10
Q.2 (a) Explain the concept of word N-grams. Describe unsmoothed word counting and discuss the need for smoothing techniques such as back-off.	10
OR	
(a) Explain context-free grammars and illustrate how they represent English sentence structure using parse trees.	10
(b) Construct a bigram language model for a small corpus of your choice. Compute probability estimates and explain how smoothing would affect the results.	10
OR	
(b) Compare top-down parsing and probabilistic parsing. Evaluate their effectiveness in handling syntactic ambiguity.	10
Q.3 (a) Explain syntax-driven semantic analysis and semantic attachments. Illustrate how meaning representation is derived using predicate logic.	10
(b) Describe how reference resolution and dialog acts contribute to conversational agents.	10
OR	
Q.3 (a) Design a CFG-based parser for a simple sentence structure and demonstrate how agreement and subcategorization constraints are enforced.	10
(b) Analyze the problem of word sense disambiguation and explain how semantic representation helps in retrieving correct meaning in context.	10