

Tribhuvan University  
Institute of Science and Technology  
**SCHOOL OF MATHEMATICAL SCIENCES**  
First Assessment 2080

**Subject: Natural Language Processing**  
**Course No.: MDS 555**  
**Level: MDS / I Year/ II Semester**

**Full Marks: 45**  
**Pass Marks: 22.5**  
**Time: 2 hrs**

*Candidates are required to give their answers in their own word as far as practicable.*

**Attempt ALL questions.**

**Group A      [5 × 3 = 15]**

1. What is NLP? List out the challenges of NLP?
2. What are the differences between Stammer and Lemmatizer ?
3. Define HMM in context of NLP.
4. What is Parsing in NLP? Discuss with examples.
5. Discuss the usability of the Word Net.

**Group B      [5 × 6 = 30]**

6. What is Context Free Grammar (CFG)? “Probabilistic CFG solve the ambiguity”.

Justify this statement with examples.

**OR**

Write a note on POS tagging.

7. Define Finite State Machines (FSM). How can we use FSM to analyze presence of the prefix? Explain with examples.

**OR**

What is n-gram language model? Explain the use of the n-gram model in NLP task.

8. How can we use NLP techniques to solve the Name Entity Recognition(NER) related problems. Explain.
9. What is Semantic Analysis? Explain, the elements of Semantic Analysis with example.
10. What is the pipeline(steps) that we follow while developing NLP based solutions?

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Tribhuvan University  
SCHOOL OF MATHEMATICAL SCIENCES  
First Reassessment Exam 2080

Subject :Natural Language Processing  
Level: MDS/IYear/II Semester  
Course No : MDS505

Full Mark:45

Pass Mark:22.5

Time:2Hours

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.

**Attempt ALL question.**

**Group A [5×3=15]**

1. Explain the applications of NLP.
2. What is Stemmer? Discuss which problem of stemmer is solved by Lemmatizer ?
3. Define HMM in context of NLP.
4. Explain dependency parsing in NLP.
5. What is Word Net? What type of data can be found on Word Net?

**Group B [5×6=30]**

6. Explain Probabilistic CFG with its application.  
OR  
Write a note on Name Entity Recognition(NER).
7. Define Finite State Machines (FSM). How can we use FSM to analyze presence of the prefix? Explain with examples.  
OR  
Explain Word Sense Disambiguation(WSD)with its applications.
8. Explain the steps involved in NLP based problem solving.
9. List the elements of Semantic Analysis. What is Semantic Analysis? What are the difference between Polysemy and Homonymy? Explain with examples.
10. Explain the use of then-gram model in NLP task.

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Tribhuvan University  
Institute of Sciences and Technology  
School of Mathematical Sciences  
2<sup>nd</sup> Assessment, 2023

**Natural Language Processing**  
**MDS505**

**MDS /I Year/II Semester**

**Full Mark: 45**

**Pass Mark: 22.5**

**Time: 2 Hours**

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*Candidates are required to give their answer in their own words as far as practicable.*

**Attempt ALL question.**

**Group A [5 × 3 = 15]**

1. What is NLP? List out the challenges of NLP?
2. What is Stemmer? Discuss which problem of stemmer is solved by Lemmatizer?
3. What is pragmatics? Why Pragmatics is important in NLP?
4. What is Parsing in NLP? Explain with example.
5. What is WordNet? Discuss the usability of the WordNet.

**Group B [5 × 6 = 30]**

6. Write note on Part-of-Speech (POS) Tagging.

**OR**

Write a note on Name Entity Recognition (NER).

7. Explain Probabilistic CFG with its application.

**OR**

Define Finite State Machines (FSM). How can we use FSM to analyze presence of the postfix? Explain with examples.

8. Explain the steps involved in NLP based problem solving.

9. List the elements of Semantic Analysis. What is Semantic Analysis? What are the difference between Polysemy and Homonymy? Explain with examples.

10. What is n-gram language model? How can we use this to capture the context of language? Example with example.

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**Natural Language Processing**  
MDS 505

MDS /I Year/II Semester

Full Mark: 45

Pass Mark: 22.5

Time: 2 Hours

*Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.*

**Attempt ALL question.**

**Group A [5 × 3 = 15]**

1. What is NLP? List out the challenges of NLP. (3)
2. What is the limitation of using Stammer? Explain with example? (3)
3. Define HMM in context of NLP. (3)
4. What is Parsing in NLP? Discuss with examples. (3)
5. Discuss the usability of the WordNet. (3)

**Group B [5 × 6 = 30]**

6. What is Context Free Grammar (CFG)? "Probabilistic CFG solve the ambiguity". Justify this statement with examples. (5)

**OR**

Write a note on POS tagging. (5)

7. What is Finite state machine? How can we use FSM to analyze presence of the prefix? Explain with examples. (1+5)

**OR**

Discuss why we need to study principles of word constriction for better understanding the language. (1+5)

8. How can we use NLP techniques to solve the Name Entity Recognition(NER) related problems. Explain. (5)

9. What is parsing? With example define Top-Down and Bottom-up parsing. (1+5)

10. Suppose you are the owner of the ABC corp which sells their product on eCommerce platform. How can you use NLP to analyze the customers re-view? Write a steps to solve the problem. (5)

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Tribhuvan University  
Institute of Science and Technology

2081



MDS / I Year / Second Semester/ Science  
**Data Science (MDS 555)**  
(Natural Language Processing)

Full Marks: 45  
Pass Marks: 22.5  
Time: 2 hours.

*Candidates are required to give their answers in their own words as far as practicable.*

The figures in the margin indicate full marks. The symbols have their usual meanings.

**Attempt all questions.**

**Group A**

[ $5 \times 3 = 15$ ]

1. Why NLP is challenging? Discuss based on one application.
2. List principles of word construction with examples.
3. What is pragmatics? Why pragmatics is important in NLP?
4. What is Parsing in NLP? Provide a brief explanation along with an example.
5. What is Word Sense Disambiguation (WSD)? Explain how WSD helpful for Sentiment Analysis?

**Group B**

[ $5 \times 6 = 30$ ]

6. Write note on Part-of-Speech (POS) Tagging.

**OR**

Write a note on Name Entity Recognition (NER)

7. What is Context-Free Grammar? Explain its definition and discuss how Probabilistic Context-Free Grammar helps in resolving ambiguity, providing a clear example to illustrate your explanation.

**OR**

What is a Finite State Machine? Describe how FSM can be utilized to analyze the presence of a postfix in a string, providing examples for better understanding.

8. What is word Similarity? Explain Lexical Similarity measurement techniques.
9. What is Semantic Analysis? List out the elements of Semantic Analysis with example.
10. A company plans to launch an intelligent customer feedback analysis system to improve its services. The system should process text feedback provided by customers, identify sentiments (positive, negative or neutral), and extract key topics mentioned in the feedback. As a student specializing in NLP, design a solution for this task. Explain the complete pipeline for developing this NLP application, detailing the key steps, methodologies, and tools you would use to implement it effectively.



Tribhuvan University  
Institute of Sciences and Technology  
**SCHOOL OF MATHEMATICAL SCIENCES**

1<sup>st</sup> Assessment, 2025

**Natural Language Processing**  
MDS505

MDS /I Year/II Semester

Full Mark: 45

Pass Mark: 22.5

Time: 2 Hours

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.

**Attempt ALL question.**

**Group A [5 × 3 = 15]**

1. What is NLP? List the applications of NLP. →
2. What is Stemmer? Discuss which problem of stemmer is solved by Lemmatizer? →
3. Define HMM in context of NLP. →
4. Explain how can we build rule based tagger.
5. What is PoS tagging? How this helps in NLP application? →

**Group B [5 × 6 = 30]**

6. Write a note on Probabilistic CFG with its application.

**OR**

Write a note on Name Entity Recognition(NER).

7. Define Finite State Machines (FSM). How can we use FSM to analyze presence of the prefix? Explain with examples.

**OR**

Explain Word Sense Disambiguation (WSD) with its applications.

8. Explain the steps involved in NLP based problem solving.

9. What is Semantic Analysis? List the elements of Semantic Analysis. With Examples list the difference between Polysemy and Homonymy?

10. Explain the use of the n-gram model in NLP task.

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Parvatham



Tribhuvan University  
Institute of Sciences and Technology  
School of Mathematical Sciences  
1<sup>st</sup> Assessment (Chance), 2025

Natural Language Processing  
MDS505

MDS /I Year/II Semester

Full Mark: 45  
Pass Mark: 22.5  
Time: 2 Hours

**Attempt ALL question.**

**Group A [5 × 3 = 15]**

1. Define NLU and NLG.
2. Why we need Lemmatizer over Stemmer?
3. Define HMM in context of NLP.
4. Explain dependency parsing in NLP.
5. What is semantic similarity, how can we calculate using Wordnet?

**Group B [5 × 6 = 30]**

6. Write a note on Part of Speech tagging.

**OR**

Write a note on Name Entity Recognition.

7. Define Finite State Machines (FSM). How can we use FSM to analyze presence of the postfix? Make state-diagram and explain.

**OR**

List the elements of Semantic Analysis. What is Semantic Analysis? What are the difference between Polysemy and Homonymy? Explain with examples.

8. Explain the steps involved in NLP based problem solving.
9. What is Tokenization? Explain bi-gram character tokenization scheme for Nepali Language with example.
10. What is sentiment analysis? How BOW can be used for Sentiment analysis task? explain with example.

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Tribhuvan University  
Institute of Sciences and Technology  
School of Mathematical Sciences  
2<sup>nd</sup> Internal Exam, December 2025

Natural Language Processing  
MDS505

MDS /I Year/II Semester

Full Mark: 45

Pass Mark: 22.5

Time: 2 Hours

Candidates are required to give their answer in their own words as far as practicable.

Attempt ALL question.

**Group A** [5 × 3 = 15]

1. Explain different levels of language processing.
2. How can we develop rule based stemmer for any Nepali language? Explain with example.
3. With example explain pragmatics and discourse are difficult in NLP.
4. What is Parsing in NLP? Explain with example.
5. What is WordNet? Discuss the usability of the WordNet.

**Group B** [5 × 6 = 30]

6. Write note on Part-of-Speech (POS) Tagging.

**OR**

Write a note on Name Entity Recognition (NER).

7. What is a Probabilistic Context-Free Grammar (PCFG), and how is it applied in computational tasks? Provide NLP based example to illustrate its application.

**OR**

What is a Finite State Machine (FSM), and how can it be used to determine the presence of a specific postfix in a string? Illustrate your explanation with examples.

8. What is tokenization? How n-gram tokenization contextualize the text?

9. Explain Word Sense Disambiguation (WSD) with its applications.

10. What is the pipeline(steps) that we follow while developing NLP based solutions? Explain with one NLP application.

Best wishes

the card ready

won't gear up

MLU  
NLG

summary that combiner user of  
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NP VP

therefore

$$P(B|A) = \frac{P(A \cap B)}{P(A)}$$

a group in the  
probabilistic sequence



**Natural Language Processing** MDS /I Year/II Semester Full Mark: **45**  
MDS505 Pass Mark: **22.5**  
Time: **2 Hr**

*Candidates are required to give their answer in their own words as far as practicable.*

**Attempt ALL question.**

**Group A [5 × 3 = 15]**

1. List out the challenges of NLP and define them.
2. Explain the principles of word construction.
3. What is pragmatics? Why Pragmatics is important in NLP?
4. Explain different techniques of Parsing with example.
5. What is WordNet? Discuss the usability of the WordNet.

**Group B [5 × 6 = 30]**

6. List out the challenges of the PoS tagger. Explain Viterbi Algorithm with example.

**OR**

Write a note on Context Free Grammer.

7. How can we compute the Semantic Similarity? Explain edit distance and cosine similarity.

**OR**

Create a Finite State Machine (FSM) for analyzing the presence of postfix.  
Elaborate on the state transitions of your FSM with examples.

8. Explain Lesk algorithm with example.
9. What is TF-IDF? How Pointwise Mutual Information solve the issue of TF-IDF?
10. A friend of yours owns an e-commerce business and is interested in enhancing the intelligence of his system by analyzing customer comments. Recommend an NLP-based solution and outline the steps you would take to achieve this task.

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