



## NLP IMP PYQ

Natural language Processing (University of Mumbai)



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## NLP

1. Explain types of referring expressions with example
2. Mention types of reference.
3. What is reference and reference resolution
4. Explain Pragmatics and Discourse Analysis with Example ?
5. Approaches of WSD ?
6. What is Word Sense Disambiguation
7. Explain different lexical databases : Wordnet and Bablenet
8. What are different relations between lexeme ?
9. What is Semantic Analysis ?
10. Examples of Bottom up parsing algorithm ?
11. Examples of top down parsing algorithm ?
12. What is CYK algorithm ? Draw the parse tree for the given statement using cyk
13. What is syntactic parsing and differentiate between its various approaches ?  
parsing algorithm
14. What are the issues in HMM MODEL ?
15. Types of POS tagging techniques ?
16. Types of POS tagging techniques ?
17. What is POS Tagging ? Need for POS tagging ?

## May 2023

1. Explain the challenges of Natural Language processing.
2. Explain how N-gram model is used in spelling correction.
3. Explain three types of referents that complicate the reference resolution problem.
4. Explain Machine Translation Approaches used in NLP.
5. Explain the various stages of Natural Language processing.
6. What is Word Sense Disambiguation (WSD)? Explain the dictionary based approach to Word Sense Disambiguation.
7. Represent output of morphological analysis for Regular verb, Irregular verb, singular noun, plural noun Also Explain Role of FST in Morphological Parsing with an example.
8. Explain the ambiguities associated at each level with example for Natural Language processing.
9. Explain Discourse reference resolution in detail.
10. For given above corpus,

N: Noun [Martin, Justin, Will, Spot, Pat]

M: Modal verb [can, will]

V: Verb [watch, spot, pat]

Create Transition Matrix & Emission Probability Matrix

Statement is "Justin will spot Will"

Apply Hidden Markov Model and do POS tagging for given statements.

<S>	Martin	Justin	can	watch	Will	<E>
<S>	Spot	will	watch	Martin	<E>	
<S>	Will	Justin	spot	Martin	<E>	
<S>	Martin	will	pat	Spot	<E>	

11. Describe in detail Centering Algorithm for reference resolution.
12. For a given grammar using CYK or CKY algorithm parse the statement  
**"The man read this book"**

Rules:

S → NP VP	Det → <i>that</i>   <i>this</i>   <i>a</i>   <i>the</i>
S → Aux NP VP	Noun → <i>book</i>   <i>flight</i>   <i>meal</i>   <i>man</i>
S → VP	Verb → <i>book</i>   <i>include</i>   <i>read</i>
NP → Det NOM	Aux → <i>does</i>
NOM → Noun	
NOM → Noun NOM	
VP → Verb	
VP → Verb NP	

13. Explain Porter Stemmer algorithm with rules.
14. Explain information retrieval versus Information extraction systems.
15. Explain Maximum Entropy Model for POS Tagging.

## Dec 2022

### Q.1 Any Four

- a) Differentiate between Syntactic ambiguity and Lexical Ambiguity.
- b) Define affixes. Explain the types of affixes.
- c) Describe open class words and closed class words in English with examples.
- d) What is rule base machine translation?
- e) Explain with suitable example following relationships between word meanings.  
Homonymy, Polysemy, Synonymy, Antonymy
- f) Explain perplexity of any language model.

### Q.2

- a) Explain the role of FSA in morphological analysis?
- b) Explain Different stage involved in NLP process with suitable example.

### Q.3

- a) Consider the following corpus

<s> I tell you to sleep and rest </s>

<s> I would like to sleep for an hour </s>

<s> Sleep helps one to relax </s>

List all possible bigrams. Compute conditional probabilities and predict the next word for the word "to".

- b) Explain Yarowsky bootstrapping approach of semi supervised learning
- c) What is POS tagging? Discuss various challenges faced by POS tagging.

### Q.4

- a) What are the limitations of Hidden Markov Model?
- b) Explain the different steps in text processing for Information Retrieval
- c) Compare top-down and bottom-up approach of parsing with example.

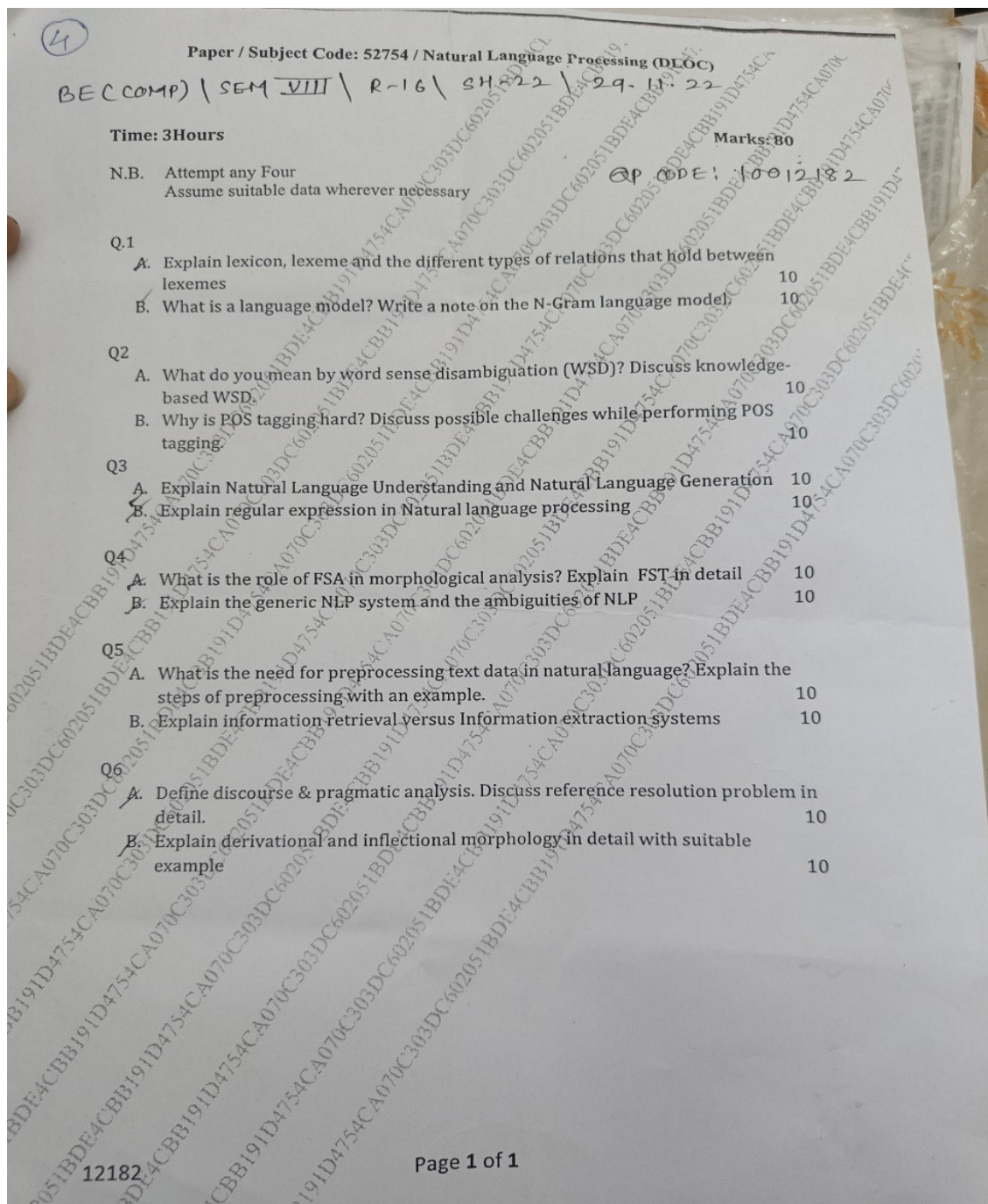
Q.5a) What do you mean by word sense disambiguation (WSD)? Discuss dictionary based approach for WSD.

b) Explain Hobbs algorithm for pronoun resolution.

Q.6

a) Explain Text summarization in detail.

b) Explain Porter Stemming algorithm in detail



## MAY 2021

1. Discuss various challenges in processing natural language.
2. What is the role of FSA in Morphological analysis?
3. What is WordNet? How is "sense" defined in WordNet? Explain with example.
4. What do you mean by stemming? Explain Porter's stemming algorithm in detail.
5. How HMM is used for POS tagging? Explain in detail.
6. Explain use of CFG in Natural Language Processing with suitable example.
7. Explain use of CFG in Natural Language Processing with suitable example.
8. Explain use of CFG in Natural Language Processing with suitable example.
9. What is Word Sense Disambiguation? Illustrate with example how Dictionary-based approach identifies correct sense of an ambiguous word.
10. Discuss in detail any application considering any Indian regional language of your choice.

## DEC 2020

1. Explain stages in NLP.
2. Define morphology. Explain types of morphology.
3. Given a mini-corpus of three sentences

```
<s> I am Sam </s>  
<s> Sam I am </s>  
<s> I do not like green eggs and ham </s>
```

Calculate following bigram probabilities from this corpus,

$P(I|<s>)$ ,  $P(\text{Sam}|<s>)$ ,  $P(\text{am}|I)$ ,  $P(\text{Sam}|\text{am})$ ,  $P(\text{do}|I)$

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4. Explain rule based tagging.
5. Write a short note on Word Sense Disambiguation.
6. What is Named-Entity recognition? Define its types.
7. What are the challenges of NLP?
8. Explain finite state transducer(FST).
9. Explain agreement and coordination.
10. Explain following Relations among lexemes & their senses, Homonymy, Synonymy, Hyponymy with example.
11. What are the five types of referring expression? Explain with example.
12. Explain Information retrieval.

## **DEC 2018**

Q. 1

- a) What is Natural language processing (NLP)? Discuss various stages involved in NLP process with suitable example.
- b) Explain derivational & inflectional morphology in detail with suitable examples.

Q. 2

- a) What is parsing? Explain Top-down & Bottom-up approach of parsing with suitable example.
- b) Discuss various approaches to perform Part-Of-Speech (POS) tagging.

Q. 3

- a) What is language model? Write a note on N-Gram language model.
- b) Explain CFG with suitable example. Discuss following potential problems in CFG such as:
  - 1) Agreement 2) Sub categorization 3) Movement..

Q. 4

- a) Define discourse & pragmatic analysis. Discuss reference resolution problem in detail.
- b) What is the role of FSA in Morphological analysis? Explain FST in detail.

Q. 5

- a) What is stemming. Explain Porter's stemming algorithm in detail.
- b) Explain with suitable examples following relationships between word meanings: Homonymy, Polysemy, Synonymy, Antonymy. Hypernymy, Hyponymy, Meronymy

Q. 6 Write a note on: (any 2)

- a) Information Retrieval.
- b) Machine translation.
- c) Sentiment analysis
- d) Wordnet.

## Dec 2017

Q.1

- a) What is morphology? Why do we need to do Morphological Analysis? Explain derivational & inflectional morphology in detail with suitable examples.
- b) What is Natural language processing (NLP)? Discuss various stages involved in NLP process with suitable example.

Q. 2

- a) Explains with suitable examples following relationships between word meanings:
  - 1)Homonymy      2) Polysemy      3) Synonymy      4)Antonymy
  - 5)Hypernymy      6) Hyponymy      7) Meronymy
- b) Explain CFG with suitable example. Discuss following potential problems in CFG such as
  - 1) Agreement    2) Sub categorization    3)Movement

Q3

- a)What is semantic analysis? Why semantic analysis is difficult? Explain various approaches to perform semantic analysis.
- b) What do you mean by word sense disambiguation (WSD)? Discuss dictionary based approach for WSD

Q4

- a) What is parsing? Explain Top-down & Bottom-up approach of parsing with suitable example.
- b) What is language model? Write a note on N-Gram language model

Q. 5

- a) What is stemming. Explain Porter's stemming algorithm with suitable examples.
- b) Discuss various approaches to perform POS tagging.

Q6 Write a note on: (any 2)

- a) Sentiment Analysis.    b) Text summarization.
- (c) Wordnet.                      d) Information Retrieval