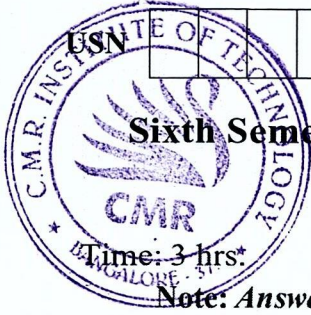


CBCS SCHEME

21AI643



Sixth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026

Natural Language Processing

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Discuss different levels on NLP with an suitable examples. (08 Marks)
- b. Explain the components of transformational grammar. (06 Marks)
- c. List and explain the challenges of NLP. (06 Marks)

OR

- 2 a. List the problems associated with n-gram model. Explain how these problems are handled. (08 Marks)
- b. Explain the applications of NLP. (06 Marks)
- c. What is X-bar theory? Explain Lexical Functional Grammar (LFG) (06 Marks)

Module-2

- 3 a. Write the C-structure and f-structure for the following sentence.
"She saw stars"
Consider the CFG.
 $S \rightarrow NP VP$
 $VP \rightarrow V \{NP\} \{NP\} PP * \{S\}$
 $PP \rightarrow P NP$
 $NP \rightarrow Det N \{PP\}$
 $S' \rightarrow Comp S$ (08 Marks)
- b. Illustrate the parts of Speech Tagging and explain different categories of POS tagging. (06 Marks)
- c. Explain the Minimum Edit Distance Algorithm and compute the minimum edit distance between EXECUTION and INTENTION. (06 Marks)

OR

- 4 a. Design CYK algorithm. Tabulate the sequence of states created by CYK algorithm while parsing.
"A pilot likes flying planes"
Consider the following grammar in CNF.
 $S \rightarrow NP VP$ $NN \rightarrow Pilot$ $VBG \rightarrow flying$
 $NP \rightarrow DT NN$ $NNS \rightarrow Planes$
 $NP \rightarrow JJ NNS$ $JJ \rightarrow flying$
 $VP \rightarrow VBG NNS$ $DT \rightarrow a$
 $VP \rightarrow VBZ NP$ $VBZ \rightarrow likes$ (08 Marks)

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- b. Explain the top-down parsing and bottom-up parsing with an example. (08 Marks)
- c. Write the disadvantages of probabilistic Context Free Grammar. (04 Marks)

Module-3

- 5 a. Explain the four patterns used to extract relationship between two entries with an example for each. (08 Marks)
- b. Explain generalized sub-sequence Kernel. (08 Marks)
- c. Discuss the following :
i) Domain knowledge
ii) Knowledge Roles (04 Marks)

OR

- 6 a. With a neat diagram, explain the architecture used in the task of learning to annotate cases with knowledge Roles. (10 Marks)
- b. With a neat diagram, explain functional overview of Infact system. (10 Marks)

Module-4

- 7 a. Explain the functioning of word matching Feedback systems. (08 Marks)
- b. Discuss iSTART system and their modules. (08 Marks)
- c. Explain Topic Model (TM) Feedback system. (04 Marks)

OR

- 8 a. Define the following :
i) Cohesion ii) Coh-matrix iii) Latent Semantic Analysis iv) Predictions. (10 Marks)
- b. Explain various approaches to analyzing texts. (10 Marks)

Module-5

- 9 a. List different IR models. Explain classical Information Retrieval Models. (10 Marks)
- b. Explain wordnet and list the applications of wordnet. (10 Marks)

OR

- 10 a. Explain design features of information retrieval systems, with a neat diagram. (10 Marks)
- b. Explain any two for the following :
i) Frame Net ii) Stemmers iii) POS tagging iv) Research Corpora (10 Marks)

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