Course: B.Tech COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)
Subject: Natural Language Processing
Subject Code: ETCS-309
Semester: V

Time: 03 Hours **Max Marks: 70**

Instructions to the Students:

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of short answer type. All questions are compulsory. Each question carries 02 marks.
3. Section B comprises 8 long answer type questions out of which students must attempt any 5. Each question carries 10 marks.
4. Do not write anything on the question paper.

Q.No.	SECTION –A (SHORT ANSWER TYPE QUESTIONS)	Marks
1. a.	List the computational frameworks for Indian languages.	(2)
b.	Distinguish between Finite State Machines, Recursive Transition Network and Augmented Transition Network.	(2)
c.	Define Machine Translation. List some machine translation applications.	(2)
d.	"Ice-cream loves to eat Sheena". This Sentence will be halted in which phase of NLP. Give reason for your answer.	(2)
e.	What do you mean by word classes. State the class of word "Bank" if Bank (the river side) and Bank (place where money is deposited).	(2)
f.	Define regular expressions. Which transition system is used to parse regular expressions?	(2)
g.	Define word sense disambiguation with suitable example.	(2)
h.	Explain some the complexities in Indian languages that are barrier for natural Language generation models.	(2)
i.	Define stemming and lemmatization.	(2)
j.	Define Natural Language Generation. List some applications of natural Language generation.	(2)

SECTION –B (LONG ANSWER TYPE QUESTIONS)

2.	Define Finite Automata. What is the application of finite automata in Natural Language Processing?	(10)

3. Consider the following annotated sentences (10)
   - Mary(N) Jane(N) can(M) see(V) Will(N)
   - Spot(N) will(M) see(V) Mary(N)
   - Will(M) Jane(N) spot(V) Mary(N)?
   - Mary(N) will(M) pat(V) Spot(N)

   Train Hidden Markov Model for Part of Speech Tagging and compute outcome for "Will spot Marry".
4. What are pattern tables/paradigm tables(PT)? What is the utilization of PT in morphology, explain with suitable example. (10)
5. NLP is also used to extract meanings from the text. Explain the techniques used for meaning representation. (10)
6. What is machine translation? Describe some challenges and characteristics of Indian languages in context of Machine Translation. (10)
7. What is word sense disambiguation? State and explain the methods for word sense disambiguation/. (10)
8. What is a frame in NLP? State one example for each type of frame. (10)
9. Describe the role of machine learning in Natural Language Processing. (10)

===END OF PAPER===