Sem : VII	Department of Computer Engineering	Time: 1 Hour
Subject : NLP	Internal Assessment – I (SH – 2023)	Total Marks: 20

Note :

- ALL questions are **compulsory**.
- Figure to the right indicates full marks.
- Assume suitable data wherever required, but justify the same.

Q. 1	a			CO	BTL
		Attempt **any two** questions from following. (Each question carries 2 marks)			
	i)	Following is the adjacency matrix for a graph of 10 nodes numbered 1 to 10. **Construct** the graph and find the Markov Blanket of node 6.		CO-3	BTL-3

	1	2	3	4	5	6	7	8	9	10
1		X	X			X	X			X
2			X			X			X	
3				X						
4	X				X		X			
5						X		X		
6				X		X		X		

| | ii) | On their trip to China, for technical paper presentation in a language conference, **Aryan**, **Shubham**, and **Rajith**, went to an eating place and ordered three foods, say Food A, Food B, and Food C, (by just pointing their fingers randomly on the menu card). With little knowledge of Chinese language, they came to know that one food is pure veg. **Aryan** wanted veg. and chose Food C, assuming it is veg. When the first dish arrived, Food A, it turned out to be non-veg. Now **Aryan**, (was in a soup (and he didn't knew how to swim in a soup(given that it is tasty but sticky and hot))), wanted to know whether to stick to his choice of Food C or switch to Food B. He called his friend, **Vamsee**, who gave a correct probabilistic reasoning to make the choice. He followed his advice and made the correct choice. **Construct** the probabilistic reasoning made by **Vamsee** and find out the choice made by **Aryan**. | | CO-3 | BTL-3 |
| | iii) | Given the following CFG G = {N, S, Σ, R} | | CO-3 | BTL-3 |

N = {S, NP, VP, PP, DT, Vi, Vt, NN, IN}

S = S

Σ = {sleeps, saw, man, woman, dog, telescope, the, with, in}

R =

S	→	NP	VP
VP	→	Vi	
VP	→	Vt	NP
VP	→	VP	PP
NP	→	DT	NN
NP	→	NP	PP
PP	→	IN	NP

Vi	→	sleeps
Vt	→	saw
NN	→	man
NN	→	woman
NN	→	telescope
NN	→	dog
NN	→	girl
DT	→	the
IN	→	with
IN	→	in

Build the parse tree of the following sentence:

The man sleeps

	B	Attempt **any three** questions from following. (Each question carries 2 marks)		
	i)	Given the following regular expression R = "\b[a-z]*[aeiou]{2}[a-z]*\b" and the following input sentence. **write** all words matched with regular expression R The woods are lovely dark and deep But I have promises to keep And miles to go before I sleep, And miles to go before I sleep.	CO-2	BTL-3
	ii)	Write the inflectional identified in the following discourse. When Agrima baked a story for not attending NLP class herself but ensuring her best friends' attendance by marking signature sheets, Floyd's stories sounded better.	CO-2	BTL-3
	iii)	**Construct** a bigram model for a word pair from the following statements. having highest probability. I am Lavanya. I like NLP. But I do not like NLP class in the morning. I am not sure whether everybody like NLP. But I do want everybody to like NLP as well as like attending NLP class	CO-2	BTL-3
	iv)	Interpret the measure of the following words, with respect to Porter Stemmer: Ichthyofaunas, psychopathology, polymorphism, glycoprotein	CO-2	BTL-3
Q. 2		Attempt **any one**. **05**		
	a)	Given the sentence "They grow tomatoes" and the following matrices, state transition matrix A and observation matrix B, **illustrate** Part-Of-Speech tagging using Viterbi algorithm for Hidden Markov Model.	CO-3	BTL-3
	b)	Use CKY algorithm and the CFG of Question 1 (a) (iii) to show that the following sentence belongs to the grammar. The man saw the girl with the telescope.	CO-3	BTL-3
Q. 3		Attempt **any one**. **05**		
	a)	Exemplify why NLP is hard. List some challenges in natural language processing.	CO-1	BTL-2
	b)	Summarize one application of NLP	CO-1	BTL-2

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