2021 SCHEME

Basavarajeswari Group of Institutions

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN										Course Code	2	1	C	S	6	4	3

Sixth Semester B.E. Degree Examinations, September/October 2024

NATURAL LANGUAGE PROCESSING

(Artificial Intelligence & Machine Learning)

Duration: 3 hrs **Max. Marks: 100**

Note: 1. Answer any* FIVE *full questions choosing ONE full Question from each Module.
2. Missing data, if any, may be suitably assumed

Q. No		*Question*	*Marks*	*(RBTL:CO:PI)*
		Module-1		
1.	**a.**	What is natural language processing? Explain in detail the building blocks of language with examples and applications.	**07**	**(2:1:1.6.1)**
	b.	List and explain the various natural language processing tasks.	**07**	**(2:1:1.6.1)**
	c.	Define and use phrase structure grammar rules to draw a parse tree for the given sentences: "The boat sailed up the river".	**06**	**(3:1:2.1.2)**
		(OR)		
2.	**a.**	Explain in detail the key stages in the NLP pipeline with suitable diagram.	**10**	**(2:1: 1.6.1)**
	b.	What are the approaches liable to solve NLP problems?	**10**	**(2:1: 1.6.1)**
		Module-2		
3.	**a.**	What is text cleaning and pre-processing? Explain the steps for each with suitable code.	**08**	**(2:2: 1.6.1)**
	b.	What is stemming and lemmatization? Demonstrate the working of stemming and lemmatization with suitable code.	**08**	**(2:2: 1.6.1)**
	c.	Explain word embedding's variants with suitable diagram.	**04**	**(2:2: 1.6.1)**
		(OR)		
4.	**a.**	Consider following training corpus and apply VSM, BoW and TF-IDF model techniques to find word2vec representation. Dog bites man Man bites dog Dog eats meat Man eats food	**10**	**(3:2: 2.1.2)**
	b.	What is n-gram model? Find the probability of the test sentence P (they play in big garden) in the following training set using bi-gram model <s>There is a big garden Children play in the garden They play inside beautiful garden<s>	**10**	**(3:2: 2.1.2)**

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI– Performance Indicator)

Module-3

5.	**a.**	What is text classification? Describe the steps to build text classification with suitable diagram.	**07**	**(2:3: 1.6.1)**
	b.	Explain in detail Naïve Bayes classifier with suitable code snippet.	**06**	**(2:3:1.6.1)**
	c.	Explain in detail SVM with suitable code snippet.	**07**	**(2:3: 2.1.2)**

(OR)

6.	**a.**	With code snippet explain the classification model using CNN.	**10**	**(2:3: 2.1.2)**
	b.	With code snippet explain the classification model using LSTM.	**10**	**(2:3: 2.1.2)**

Module-4

7.	**a.**	What is information extraction? Explain in detail with suitable diagram the general pipeline of information extraction.	**10**	**(2:4: 1.6.1)**
	b.	What are KPE and NER? With a proper code snippet illustrates implementation of KPE and NER.	**10**	**(2:4: 1.6.1)**

(OR)

8.	**a.**	What is the role of IE tasks and explain the different tasks to extract knowledge from text?	**10**	**(2:4: 1.6.1)**
	b.	Explain NED, NEL and RE and mention application of IE.	**10**	**(2:4: 1.6.1)**

Module-5

9.	**a.**	What are chat bots and mention its applications? What are the major classifications of chat bot?	**06**	**(2:5: 1.6.1)**
	b.	What are the types of chat bot based on interaction with the user with suitable example and compare to prove which chat bot is a current trend?	**07**	**(2:5: 1.6.1)**
	c.	With suitable diagram explain in detail the pipeline for building dialogue systems.	**07**	**(2:5: 1.6.1)**

(OR)

10.	**a.**	Explain seq2seq model in detail with necessary diagram.	**10**	**(2:5: 2.1.2)**
	b.	Explain Deep Reinforcement Learning (DRL) for dialogue generation in detail with necessary diagram.	**10**	**(2:5: 1.6.1)**

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