Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2022

CS3EA06 Natural Language Processing

Programme: B.Tech. Branch/Specialisation: CSE

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Which language can be called as ambiguous language? **1**
(a) Natural Language (b) Formal Language
(c) Programming language (d) Scripting Language

ii. Finite state transducer can be used as: **1**
(a) Recognizer (b) Transducer
(c) Generator (d) All of these

iii. Word segmentation is mostly used when: **1**
(a) Hyphens are present
(b) Long sentences
(c) Multiple alphabets intermingled
(d) No space between words

iv. Derivation morphemes are- **1**
(a) Suffixes (b) Infixes (c) Prefixes (d) All of these

v. What kind of signal is used in speech recognition? **1**
(a) Electromagnetic signal (b) Electric signal
(c) Acoustic signal (d) Radar

vi. What is viewed as problem of probabilistic inference? **1**
(a) Speech recognition (b) Speaking
(c) Hearing (d) Utterance

vii. How many bi-gram probabilities can be obtained from following sentence "I like to eat apple". **1**
(a) 3 (b) 4 (c) 5 (d) 6

viii. Extrinsic evaluation is…. **1**
(a) Cheaper (b) Costlier (c) Not required (d) irrelevant

ix. The grammatical category associated with affirmative and negative statement is called as…..... **1**
(a) Sensitivity (b) Logic (c) Polarity (d) Subjectivity

P.T.O.

x. Precision and recall compositely makes…… **1**
(a) E-measure (b) Z-measure (c) B-measure (d) F-measure

Q.2 i. What is the difference between Natural language understanding and Natural language generation? **2**

ii. List some components of NLP also list some areas of NLP. **3**

iii. Explain the difference between formal language and natural language with appropriate example. **5**

OR iv. Why regular expression is important for text processing? Justify with an example. **5**

Q.3 Attempt any two:

i. What is Lemmatization, stemming and tokenization in NLP? Explain with an example. **5**

ii. How Morphology can be generated with the help of Finite state machine? **5**

iii. What is Part of speech tagging: rule based, Stochastic POS, Transformation based tagging? **5**

Q.4 Attempt any two:

i. What do you mean by Computational Phonology, how speech and phonetics are interrelated? **5**

ii. Explain Phonological rules with an example. **5**

iii. How minimum edit distance help for correcting spelling errors? **5**

Q.5 i. Explain Unigram, Bi-gram and N-gram Language Model. **4**

ii. Write a short note on importance of Smoothing and Perplexity. **6**

OR iii. What is Parsing? Also explain its types with an example. **6**

Q.6 Attempt any two:

i. Explain the term “Ambiguity”, also explain different level of ambiguity occur in Natural Language Processing. **5**

ii. Explain steps involve for Sentiment Analysis. **5**

iii. How to implement machine translation using Natural Language Processing? **5**

******

Marking Scheme

CS3EA06 Natural Language Processing

Q.1	i.	Which language can be called as ambiguous language? (a) Natural Language		**1**
	ii.	Finite state transducer can be used as: (d) All of these		**1**
	iii.	Word segmentation is mostly used when: (b) Long sentences		**1**
	iv.	Derivation morphemes are- (d) All of these		**1**
	v.	What kind of signal is used in speech recognition? (c) Acoustic signal		**1**
	vi.	What is viewed as problem of probabilistic inference? (a) Speech recognition		**1**
	vii.	How many bi-gram probabilities can be obtained from following sentence "I like to eat apple". (b) 4		**1**
	viii.	Extrinsic evaluation is…. (b) Costlier		**1**
	ix.	The grammatical category associated with affirmative and negative statement is called as…..... (c) Polarity		**1**
	x.	Precision and recall compositely makes…… (d) F-measure		**1**
Q.2	i.	Difference between Natural language understanding and Natural language generation 1 mark for each difference	(1 mark * 2)	**2**
	ii.	Components of NLP Some areas of NLP	2 marks 1 mark	**3**
	iii.	Any four difference between formal language and natural language 1 mark for each (1 mark * 4) Example	4 marks 1 mark	**5**
OR	iv.	Important for text processing Justification with an example	3 marks 2 marks	**5**
Q.3		Attempt any two:		
	i.	Lemmatization Stemming Tokenization in NLP Example	1 mark 1 mark 1 mark 2 marks	**5**
	ii.	Morphology can be generated with the help of Finite state machine As per the explanation		**5**
	iii.	Part of speech tagging: Rule based tagging Stochastic POS Transformation based tagging	 2 marks 2 marks 1 mark	**5**
Q.4		Attempt any two:		
	i.	Computational Phonology Speech and phonetics are interrelated	2 marks 3 marks	**5**
	ii.	Phonological rules with an example 1 mark for each	 (1 mark * 5)	**5**
	iii.	Minimum edit distance help for correcting spelling errors As per the explanation		**5**
Q.5	i.	Unigram Bi-gram N-gram Language	1 mark 1 mark 2 marks	**4**
	ii.	Importance of Smoothing Importance of Perplexity	3 marks 3 marks	**6**
OR	iii.	Parsing Its types with an example 2 marks for each type (2 marks * 2)	2 marks 4 marks	**6**
Q.6		Attempt any two:		
	i.	Ambiguity Level of ambiguity	1 mark 4 marks	**5**
	ii.	Steps involve for Sentiment Analysis.		**5**
	iii.	Implement machine translation using As per the explanation		**5**

******