PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004

Department of Computer Science and Engineering

B.E- Computer Science and Engineering 5th Semester

### CONTINUOUS ASSESSMENT TEST 3 Date: 09.11.2022

19Z503 - ARTIFICIAL INTELLIGENCE

### Time: 1 Hour 15 minutes. Maximum Marks: 35

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| **INSTRUCTIONS:** |
| 1. Answer **ALL** questions. 2. Question No. 1 carries 8 Marks and question No. 2 carries 27 Marks 3. In question No. 1, subdivision **a** carries total of 8 marks (one mark for each question). 4. In question No. 2, subdivision **a** carries total of 7 marks (one mark for each question), subdivisions **b(i)** and **b(ii)** carries 5 marks each and subdivision **c** carries 10 marks.   Qn. 1  CO 1 to 4  Qn.2  CO. 5   1. Course Outcome Table : |

**Group I**

1. **a (8 x 1 mark = 8 marks)**

* Write the alphabet of your choice answer for the questions i, iii, v & vii in the CA test answer book mentioning the question number and subdivision number.
* Write the answer for the Fill in the blanks questions ii, iv, vi & viii in the CA test answer book mentioning the question number and subdivision number.

i. Which of the following may NOT be an actuator for a robot tasked with performing Covid-19 test on pedestrians?

1. Display for flashing result
2. Speaker for screaming "I have found one!"
3. Injection system to take blood sample
4. Sprayer for disinfectant to cleanse hands of humans taking tests

ii. If an agent considers the agreement between internal utility function and external performance measure, then it is an \_\_\_\_\_\_\_\_\_\_\_\_

iii. Search algorithms are usually designed in the following pattern:

1. Formulate-Search-Execute
2. Design-Formulate-Search
3. Formulate-Search-Complete
4. Design-Search-Execute

iv. In general, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is the preferred uninformed search method when the search space is large and the depth of the solution is not known

v. Skolem functions help to \_\_\_\_\_\_\_\_\_

1. Reduce the scope of each ¬ to a single term
2. Eliminate Universal quantifiers
3. Eliminate existential quantifiers
4. Eliminate all →

vi. Combining the propositional logic clauses “ ¬January ∨ ¬precipitation” and “¬clouds ∨ precipitation” will give the result \_\_\_\_\_\_\_\_\_\_\_\_

vii. Planning Graph can NOT \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Give better heuristic estimates than most search approaches
2. Applied to any of the search techniques
3. Give the best/optimal results all the time
4. Use algorithm GRAPHPLAN

viii. If the available feedback provides the correct answer for example inputs, then the learning problem is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **a (7 x 1 mark = 7 marks)**

Write the alphabet of your choice answer in the CA test answer book mentioning question number and subdivision number.

i. Natural Language Processing in AI will not be useful if\_\_\_\_\_\_\_\_\_\_\_

1. Target representation appropriate for task at hand
2. Source language and the mapping into target representation are available
3. Definition of task to be performed is available
4. Language is available as set of strings but not necessarily requiring reference to task to be performed

ii. In NLP, non-word tokens are separated from words is done during

1. Morphological Analysis
2. Syntactic analysis
3. Semantic analysis
4. Discourse integration

iii. In NLP, processing written text requires\_\_\_\_\_

1. Syntax, semantic knowledge of the language, Real world information and phonology
2. Syntax and semantic knowledge of the language and Real world information
3. Syntax, semantic knowledge of the language, and phonology
4. Semantic knowledge of the language, Real world information and phonology

iv. The markers which provide a place to accumulate information about the entities during NLP syntactic analysis are called as\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Reference Markers
2. Collocation Markers
3. Syntactic Marker
4. Semantic Marker

Write the answer for the Fill in the blanks questions in the CA test answer book mentioning question number and subdivision number.

v. In NLP, structure representing what was said is reinterpreted to determine what was actually meant during \_\_\_\_\_\_\_\_\_\_\_\_\_phase

vi. In NLP, building every possible intermediate components to handle multiple possible interpretations is done in \_\_\_\_\_\_\_\_\_\_\_ method

vii. In \_\_\_\_\_\_\_\_\_\_\_\_ analysis of NLP, mapping between syntactic structures and objects in task domain is made.

**b. (2 x 5 marks = 10 marks)**

i. Explain how n-gram models are used in language identification tasks.

ii. Compute the following

* Consider a language that consists of 1000 characters. The language model specifies that each one of the characters is equally likely to appear in any sequence in that language. Compute the perplexity for the above language model.
* Consider an IR system that has returned a result set for a single query out of a corpus of 100 documents. The documents returned are categorized as given by the table below:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **In result set** | | **Not in result set** |
| **Relevant** | | 30 | 20 |
| **Not Relevant** | | 10 | 40 |

Compute the precision and recall in this scenario.

**c. (1 x 10 marks = 10 marks)**

i. Consider the text “I want to print John’s .init file” made by Bill in an operating system interface. Analyze how the above statement would be processed in the various phases of Natural Language Processing (NLP) to derive the actual meaning of the statement.

(OR)

ii. Describe the n-gram character model and related smoothing techniques