

## **Natural Language Processing / Understanding**

**21st August, 2021**

**Time - 2 hours**

**Full marks - 20**

1. What is the importance of transfer learning in NLP? Explain how it can be made use of to build a scientific publication classification system. (1+2)

2. (a). What are speech acts? What kind of NLP systems need to incorporate speech acts in their design? Why? Explain with examples. (2 + 2)

3. You have to build a “Know Your Customer” application for an online retail store B, which will not only gather information about a customer from her actions in the store itself but also from outside, whenever possible .

(a). What kind of information would you like to gather for that? Design a full schema and clearly mention what type of data will be stored in which field and where will the data come from? (2)

Design a recommender system based on the data gathered above. The design should clearly indicate all the reasoning components needed for the task highlighting the underlying NLP problems - along with indications of techniques that can be used to solve them. (2)

4. What is relation extraction? Why is it a challenging problem? Explain with at least 3 examples from a single domain - along with solutions for tackling the problems. (1 + 2 + 2)

5. You have to design a NLP based system that can be used to correct grammatically incorrect English sentences. The system will have a simple interface where a user will type in a short English sentence (maximum 15 words) in a text box. If the sentence is grammatically correct - the system will assign full score to the user. If the sentence is incorrect - the system will provide the correct alternative. For example - if a user types “I am wrote the NLP test yesterday” - the system will produce an output that says - “The correct form of the sentence is - I have written the NLP test yesterday.”

Present detailed architecture of how such a system can be designed. Justify your design. (4)