1. **What you understand by Text Processing? Write a code to perform text processing**

Text processing is process of sorting and analysing the unstructured text or sentence.

Example like in a sentence everything can be made lower case or upper case, also removing numeric value in a sentence.

def remove\_num(text)

result= re.sub(r’\d+’,”, text)

return result

sentence = “There are 28 states in India, and 6 union territories”

remove\_num(sentence)

1. **What you understand by NLP toolkit and spacy library? Write a code in which any one gets used.**

Platform used to build python programs which work with human language. It contains text processing libraries for tokenization, parsing, classification etc

Spacy is open source library for NLP, if there is large volume of text then spacy is helpful and it can be used as information extraction also.

**3. Describe Neural Networks and Deep Learning in Depth**

Neural network is the model of how human brain works, it provides solution to complex problems and simulate NLP. It consists of neurons or nodes interconnected and organized in layers. It consists of input layer, which receives data and hidden layers which propagates the data. Output layer which sends result of analysis of NLP.

Deep learning is a subset of machine learning that uses algorithms by structured and function of human brain. It can automatically identify the patterns and features without programs are required.

Architecture includes RNNs, CNNs, Transformers, Hybrid models.

**4.what you understand by Hyperparameter Tuning?**

Hyperparameter tuning is process of selecting the optimal values for ML. Hyperparamter are often used to tune the performance of model, and they can have a significant impact on the model accuracy generalization and other metrics.

**5. What you understand by Ensemble Learning?**

Ensemble learning is an approach in which two or more are fitted to the same data, and the predictions of each model are combined, It aims to achieve better performance with the ensemble of models than with any individual model.

**6. What do you understand by Model Evaluation and Selection ?**

Model evaluation is the process of using different evaluation metrics to understand a machine learning models performance as well as is strengths and weakness. It is important to assess the efficacy of a model during initial research phases and it also plays a role in model monitoring.

Selection procedure is performed to select the most suitable model for the dataset. Part of the data available is used to train the predictive model and the remaining to test its accuracy. Once trained the predictive model is able to provide future forecast of the variable under analysis.

**7. What you understand by Feature Engineering and Feature selection? What is the difference between them?**

Feature engineering is the process of transforming raw data into features that are suitable for ML models. In other words it is the process of selecting, extracting and transforming the most relevant features from the available data to build more accurate and efficient Ml models.

Feature selection is method of reducing the input variable to your model by using only relevant data and getting rid of noise data. It is the process of automatically choosing relevant feature for your ML model based on the type of problem.

The difference between feature engineering focuses on creating new features or transforming existing ones to makes them more useful to the algorithm, while feature selection focuses on selecting the most informative subset or features from dataset.