**LEARNING AND ADAPTIVE SYSTEMS – TASK 5**

**ANSWER ALL QUESTIONS**

**Question One -20**

1. Jacobian distance and Kullerback Leibler divergence (KL) distance are often used to evaluate the similarity between features in a feature space. Describe how each of this concepts useful in estimation theory.
2. Using illustrative example, describe the concept of curse of dimensionality including methods for dimension reduction. Also include its limitations

**Question Two - 20**

1. Briefly describe what NLP Systems are and any four applications of NLP.
2. Word Sense Disambiguation is often used to clarify meaning based on context and semantic sequence. Using examples describe this concept and its key features.

**Question Three - 20**

1. A smoothing parameter is critical in determining the quality of results. Briefly explain the concept of smoothing and any two smoothing methods using cross validation
2. Using distinguish learning from deep learning give merits, demerits and applications of each