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| **SESSION** | **FEBRUARY - MARCH 2024** |
| **PROGRAM** | **MASTER OF BUSINESS ADMINISTRATION (MBA)** |
| **SEMESTER** | **IV** |
| **COURSE CODE & NAME** | **DADS401-ADVANCED MACHINE LEARNING** |
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**Assignment Set – 1**

**1. (a) Discuss the objective of Time Series Analysis.**

**(b) Explain the merits and demerits of using Smoothing.**

**Ans 1.**

**(a) Objective of Time Series Analysis**

Time Series Analysis (TSA) is a statistical method that analyzes time series data, which are data points indexed in time order. The primary objective of TSA is to develop models that can predict future values based on previously observed values. This analysis is crucial in various fields such as economics, business, finance, science, and engineering where it is essential to forecast future trends from past data.

The goals of TSA can be broadly categorized as follows:

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**2. (a) Define AR (0), AR (1) and AR (2).**

**(b) Define ARCH Model. Discuss its usage.**

**Ans 2.**

**a. AR Models:**

Autoregressive (AR) models are a class of linear models where future values of a variable are assumed to be a linear function of past observations. They are commonly used in time series forecasting to describe time-dependent structures in the data.

**AR(0) Model**: This is the simplest form of the autoregressive model where the current value of the series is equal to a constant term plus a stochastic error term. Mathematically, it can be

**3. (a) Explain some challenges or limitations we face with Deep Learning.**

**(b) Explain any three applications of AI in Medical sciences.**

**Ans 3.**

**a. Challenges and Limitations of Deep Learning**

Deep learning has transformed many technological fields, delivering impressive performance across a range of complex tasks. However, it faces several challenges and limitations that can impact its effectiveness and applicability:

**Data Dependency**: Deep learning models require large amounts of data to train effectively. This dependency on big data can be a significant hurdle in fields where data is scarce,

**Assignment Set – 2**

**4. (a) Define Back Propagation.**

**(b) Describe some applications of ANN.**

**Ans 4.**

**a. Definition and Mechanism of Back Propagation**

Back propagation is a fundamental algorithm used for training artificial neural networks (ANN). Essential for supervised learning, it facilitates the minimization of error by adjusting the weights of the network. This method involves two main phases: forward pass and backward pass.

In the **forward pass**, input data is passed through the network, layer by layer, until the output

**5. (a) Differentiate CNN vs RNN.**

**(b)Write a short note on max pooling and average pooling?**

**Ans 5.**

**a. Differentiating CNN and RNN**

Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) are two types of neural network architectures designed for different tasks and data types, reflecting their distinct structural characteristics.

**CNNs** are primarily used for spatial data processing, such as images and videos. A CNN's architecture is well-suited to capture spatial hierarchies in data by applying convolutional

**6. (a)What is Auto-Encoder? Explain its classification.**

**(b)Describe the types of RL algorithm(s).**

**Ans 6.**

**a. Auto-Encoders and Classification**

An Auto-Encoder is a type of artificial neural network used primarily for unsupervised learning of efficient codings. The goal of an auto-encoder is to learn a representation (encoding) for a set of data, typically for the purpose of dimensionality reduction. Notably, an auto-encoder is trained to ignore noise and recreate the input at its output.

Structure and Mechanism: An auto-encoder typically consists of two main parts: the encoder