1. Which mathematical measure is commonly used to assess speech distortion?

a) Log Spectral Distance
b) Dynamic Time Warping
c) Mean Squared Error
d) Singular Value Decomposition

Answer: a) Log Spectral Distance

Explanation: Log Spectral Distance is a mathematical measure commonly used to quantify the distortion between two speech signals by comparing their spectral characteristics in the logarithmic domain.

2. Which technique involves comparing the cepstral features of speech signals?

a) Dynamic Time Warping
b) Weighted Cepstral Distances
c) Likelihood Distortions
d) Singular Value Decomposition

Answer: b) Weighted Cepstral Distances

Explanation: Weighted Cepstral Distances involve comparing the cepstral coefficients of speech signals while considering different weights assigned to each coefficient based on their significance in representing speech information.

3. What method is used to align speech signals with varying time lengths for distortion analysis?

a) Singular Value Decomposition
b) Dynamic Time Warping
c) Log Spectral Distance
d) Likelihood Distortions

Answer: b) Dynamic Time Warping

Explanation: Dynamic Time Warping is a technique used to align two sequences with varying time lengths, commonly employed in speech processing to compare and analyze speech signals despite differences in their durations.

4. Which coefficient set is commonly used for speech analysis due to its robustness against noise and distortion?

a) LPC Coefficients
b) PLP Coefficients
c) MFCC Coefficients
d) DCT Coefficients

Answer: c) MFCC Coefficients

Explanation: Mel-Frequency Cepstral Coefficients (MFCC) are widely used in speech analysis due to their robustness against noise and distortion, making them effective features for tasks such as speech recognition and speaker identification.

5. What measure evaluates the likelihood of a speech signal being distorted based on statistical modeling?

a) Dynamic Time Warping
b) Likelihood Distortions
c) Weighted Cepstral Distances
d) Log Spectral Distance

Answer: b) Likelihood Distortions

Explanation: Likelihood Distortions assess the likelihood of a speech signal being distorted based on statistical modeling, providing insights into the probability of certain types of distortions affecting the signal.

6. Which technique employs a warped frequency scale to evaluate spectral distortion in speech signals?

a) LPC
b) PLP
c) MFCC
d) Spectral Distortion

Answer: d) Spectral Distortion using a Warped Frequency Scale

Explanation: Spectral Distortion using a Warped Frequency Scale involves analyzing spectral characteristics of speech signals by warping the frequency scale, which can provide better representation of human auditory perception.

7. What method is utilized for aligning speech signals in a time-varying manner for distortion analysis?

a) Singular Value Decomposition
b) Dynamic Time Warping
c) Log Spectral Distance
d) Cepstral Distances

Answer: b) Dynamic Time Warping

Explanation: Dynamic Time Warping is utilized to align speech signals in a time-varying manner, facilitating distortion analysis by accommodating variations in the temporal structure of the signals.

8. Which feature extraction technique incorporates a perceptual weighting function to enhance speech analysis?

a) LPC Coefficients
b) PLP Coefficients
c) MFCC Coefficients
d) Cepstral Distances

Answer: b) PLP Coefficients

Explanation: Perceptual Linear Prediction (PLP) Coefficients incorporate a perceptual weighting function to enhance the representation of speech signals, making them effective for speech analysis tasks.

9. What measure evaluates distortion in speech signals by considering the likelihood of observed features under different distortion conditions?

a) Dynamic Time Warping
b) Likelihood Distortions
c) Weighted Cepstral Distances
d) Spectral Distortion

Answer: b) Likelihood Distortions

Explanation: Likelihood Distortions evaluate distortion in speech signals by considering the likelihood of observed features under different distortion conditions, providing a probabilistic framework for analyzing speech quality.

10. Which technique is commonly used for normalizing speech signals to a reference template for distortion analysis?

a) Dynamic Time Warping
b) Singular Value Decomposition
c) Log Spectral Distance
d) Time Alignment

Answer: d) Time Alignment

Explanation: Time Alignment is commonly used for normalizing speech signals to a reference template, ensuring consistency in temporal structure for accurate distortion analysis.