Quiz No. 1 (DSP)

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Read the following questions carefully and select the best answer from the choices given.

What type of spectrum is periodic due to aliasing? 1 point

- Discrete spectrum
- Line spectrum
- Continuous spectrum
- Sampled spectrum

What does the impulse response of an FIR filter represent? 1 point

- The filter's response to a sinusoidal input
- Its steady-state output
- A sequence of values for a unit impulse input
- Its response to a step input

Which window function is the simplest to implement but prone to high spectral leakage? 1 point

- Hamming window
- Blackman window
- Rectangular window
- Flat-top window

What is a common task in image processing? 1 point

- Noise reduction
- Frame extraction
- Speech recognition
- Compression

What does multimedia processing primarily involve? 1 point

- Handling only text data
- Managing and analyzing multimedia data such as text, images, audio, and video
- Encoding binary data into multimedia formats
- Designing only video codecs

What does the digital spectrum represent? 1 point

- Time-domain representation of signals
- Frequency components of a digital signal
- Energy content of continuous signals
- Amplitude variations over time

Which structure is typically used to implement FIR filters? 1 point

- Lattice structure
- Tapped delay line
- Recursive loop
- State-variable structure

What is the purpose of a window function in digital signal processing? 1 point

- To amplify signals
- To modify the shape of a signal
- To reduce signal noise
- To increase the duration of a signal

Which spectrum represents the magnitude of a signal's Fourier transform? 1 point

- Phase spectrum
- Band spectrum
- Magnitude spectrum
- Power spectrum

What is a key characteristic of window functions? 1 point

- They operate on continuous signals only
- They ensure a finite signal duration
- They amplify spectral leakage
- They reduce signal length

What distinguishes an IIR filter from other filter types? 1 point

- It does not use feedback.
- It has an impulse response that lasts forever.
- It only uses past outputs for computation.
- It has a linear response in the frequency domain.

What does "IIR" stand for in IIR filters? 1 point

- Infinite Input Response
- Impulse Input Response
- Infinite Impulse Response
- Impulse Infinite Response

What makes FIR filters inherently stable? 1 point

- Use of feedback loops
- Linear phase response
- Finite number of past input samples
- Complex coefficient calculations

Which of the following filters is known for a smooth magnitude response? 1 point

- Chebyshev Filter
- Butterworth Filter
- Elliptic Filter
- Gaussian Filter

Which multimedia application involves face recognition and video surveillance? 1 point

- Entertainment
- Communication
- Security
- Healthcare

What problem do window functions help reduce in spectral analysis? 1 point

- Phase distortion
- Spectral leakage
- Frequency aliasing
- Signal quantization

Which transform is specifically used for signal compression, such as in JPEG? 1 point

- Discrete Fourier Transform (DFT)
- Z-transform
- Fast Fourier Transform (FFT)
- Discrete Cosine Transform (DCT)

What characteristic is unique to Chebyshev filters? 1 point

- ○ No ripples in the passband
- ○ Equiripple behavior in the stopband
- ○ Sharpest transition with ripples in both bands
- ○ Equiripple behavior in the passband

What is a defining characteristic of FIR filters? 1 point

- ○ Infinite impulse response
- ○ Feedback mechanism
- ○ Finite memory and impulse response
- ○ Unpredictable phase behavior

Which multimedia processing technique includes tokenization and stemming? 1 point

- ○ Audio processing
- ○ Video processing
- ○ Image processing
- ○ Text processing

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