1. Which of the following is a basic intensity transformation function used in spatial domain image enhancement?
a) Gaussian filter
b) Laplacian filter
c) Power-law transformation
d) Butterworth filter

Answer: c) Power-law transformation
Explanation: Power-law transformation involves raising the pixel values of an image to a certain power, which can adjust the image's contrast and brightness.

2. Which type of spatial filter is used for reducing image noise and blurring the image?
a) High pass filter
b) Sharpening filter
c) Low pass filter
d) Unsharp masking filter

Answer: c) Low pass filter
Explanation: Low pass filters allow only low-frequency components to pass through, effectively smoothing or blurring the image.

3. What is the purpose of unsharp masking in image enhancement?
a) To increase image brightness
b) To reduce image contrast
c) To enhance image details
d) To introduce image noise

Answer: c) To enhance image details
Explanation: Unsharp masking involves subtracting a blurred version of the image from the original to enhance fine details and edges.

4. Which type of spatial filter is applied to increase the overall sharpness of an image?
a) Low pass filter
b) High pass filter
c) Median filter
d) Gaussian filter

Answer: b) High pass filter
Explanation: High pass filters enhance edges and details by emphasizing high-frequency components in an image.

5. What is a common technique used for combining spatial enhancement methods to improve image quality?
a) Histogram equalization
b) Median filtering
c) Adaptive filtering
d) Image fusion

Answer: d) Image fusion
Explanation: Image fusion involves combining multiple images or enhancement techniques to produce a single image with improved quality and detail.

6. Which type of frequency domain filter is commonly used for image smoothing?
a) Butterworth low pass filter

b) Gaussian high pass filter
c) Butterworth high pass filter
d) Gaussian low pass filter

Answer: d) Gaussian low pass filter
Explanation: Gaussian low pass filters attenuate high-frequency components in the frequency domain, resulting in image smoothing.

7. What is the primary purpose of a Butterworth high pass filter in frequency domain image processing?
a) To reduce image noise
b) To enhance image contrast
c) To smooth the image
d) To sharpen the image

Answer: d) To sharpen the image
Explanation: Butterworth high pass filters emphasize high-frequency components, which enhances image sharpness and detail.

8. Which selective filtering technique is used to enhance specific frequency bands in an image while suppressing others?
a) High pass filtering
b) Bandpass filtering
c) Low pass filtering
d) Notch filtering

Answer: b) Bandpass filtering

Explanation: Bandpass filtering allows a specific range of frequencies to pass through while suppressing others, thus enhancing particular features in the image.

9. Which type of filter is most suitable for reducing the effects of Gaussian noise in an image?
a) Median filter
b) Laplacian filter
c) Gaussian filter
d) Sobel filter

Answer: a) Median filter
Explanation: Median filtering is effective for reducing Gaussian noise because it replaces each pixel value with the median value in its neighborhood, which is less affected by outliers.

10. Which spatial domain method is primarily used for enhancing edges and fine details in an image?
a) Smoothing spatial filters
b) Sharpening spatial filters
c) Basic intensity transformation functions
d) Combined spatial enhancement method

Answer: b) Sharpening spatial filters
Explanation: Sharpening spatial filters, such as un sharp masking and high boost filters, are specifically designed to enhance edges and fine details in an image.