Name: Mohammad Shehroz Ashrad
Z Number: Z23747902

Homework 2 - Digital Image Processin

Question 1:
Matlab PDF uploaded.

Question 2:
Answer:
Floyd-Steinberg Dithering:

- The resulting image has clearer patterns, and transitions between shades appear more pronounced or grainy. In high-contrast areas, the dithering is also more distinct.

Jarvis-Judice-Ninke Dithering:

- The image is smoother, and especially in gradient areas. There are fewer noticeable dots or patterns, creating a more visually continuous result.

Question 3:
Answer:
Kuwahara Filter:

- The Kuwahara filter is a nonlinear smoothing filter used in image processing that preserves edges while also reducing noise. Unlike traditional smoothing filters (such as Gaussian or average filters) that tend to blur both noise and important details like edges, the Kuwahara filter selectively smooths regions while maintaining the sharpness of edges.

Question 4:
Matlab PDF uploaded.

Question 5:
Answer:

- Step 1: Load the image and convert it to grayscale if necessary to ensure proper quantization.

- Step 2: Set the number of grayscale levels to 32. Calculate how much each level will change (step size).

- Step 3: Use imresize to shrink the image to 1/8 of its original size, reducing the number of unique pixel values.

- Step 4: Scale the image back to its original size to smooth the pixel values, resulting in fewer unique grayscale levels.