Inel 5327
Exam II Review Questions
Chapter 3

1. Write the vector and mask representation of linear filtering. What operations can be done by spatial filtering.
2. How does the size of the mask affect the objects in the image to be filtered. What happens to small objects if they are smoothed by filter masks of larger size.
3. What is the effect on the borders of an image when it is filtered by smoothing masks.
4. What are the non-linear filters. What are they useful for?
5. What is the mathematical representation of sharpening filters.
6. What is the second derivative used for? What is the mask representation of second derivative based filters and what are the steps involved in filtering.
7. What is unsharp masking. What are the steps involved.
8. What are the different ways of implementing the gradient. What are the operators based on the gradient. What features of the image do they extract.

Exercises from the chapter: 3.15, 3.17, 3.19, 3.21, 3.23, 3.24, 3.25, 3.27, 3.28, 3.29

Chapter 4

1. How is the Fourier transform useful for image processing.
2. What are the 2D DFT and inverse DFT operators .
3. What is the 2D sifting property.
4. What is the 2D sampling theorem.
5. What is the 2D convolution. How is it implemented.
6. Explain image interpolation and resampling. What is their effect on shrinking and zooming an image.
7. What are Moire patterns.
8. What features are represented in Fourier spectrum and phase angle. What do the images reconstructed from only Fourier spectrum and from only phase angle represent? How can we judge about the intensity and characteristic features from these two representations.
9. In what different ways does aliasing affect a sampled digital image.
10. What are the steps for filtering in the frequency domain.

Exercises 4.4, 4.5, 4.7, 4.11, 4.12, 4.13, 4.15, 4.21, 4.22, 4.27, 4.30, 4.32, 4.36