PE questions

Introduction to Digital Images

1. How is an image formed ?
2. How is a pixel represented ?
3. Pros and cons of back-lighting ?
4. Explain the following terms :
    - Focus
    - Depth-of-field
    - Zoom
    - Field-of-view
    - Focal length
    - Shutter
    - Aperture

Point Processing

1. What does Point Processing mean?
2. Describe Brightness and Contrast
3. Describe greylevel mapping and how it relates to Brightness and Contrast
4. What is a histogram?
5. How can a histogram be used to choose the greylevel mapping?
6. What is histogram stretching?
7. What is thresholding and how is it related to a histogram and to segmentation?

Color

1. What is the difference between Achromatic and Chromatic?
2. What is the difference between Subtractive Color and Additive Color?
3. Describe the three different color spaces (RGB, rgI, HSI).
4. What are their characteristics and where are they used?

Neighborhood Processing

1. What is the different between point processing and neighborhood processing?
2. What role does the size of the Kernel play?
3. What is a Mean filter and what can it be used for?
4. What is a Median filter and what can it be used for?

5. Is a Median filter better than a Mean filter regarding noise (salt and pepper) removal? Why/why not?
6. What is Template matching and what can it be used for?
7. What is Correlation and how is it different from convolution?

Morphology

1. Explain the following concepts:
    - Hit, Fit, Erosion, Dilation, Opening, Closing
2. How are they related?
3. What can they be used for (applications)?
4. How can morphology be used to find the outline (edge) of an object?

BLOB analysis

1. What does BLOB stand for?
2. What is the purpose of BLOB analysis?
3. What is connectivity?
4. How can a BLOB be extracted from an image?
    a. Describe the principles
5. What is a feature and what is it used for?
    a. Mention at least 5 different features
6. What is feature matching?
    a. How can it be carried out?
    b. What should we be aware of?

Edge Detection

1. What is an image edge?
2. What are the three steps in general edge detection?
3. What is the gradient vector and its magnitude?
    a. How is it calculated/approximated?
4. What is the threshold dilemma in edge detection?
5. How does the Sobel edge detector work?
6. How does the Canny edge detector work?