Short Questions

1. What is the objective of Least Mean Square (LMS) filters in image processing?
2. How does Constrained Least Squares Restoration differ from traditional least squares methods?
3. What are the main advantages of using interactive restoration techniques?
4. Describe the role of regularization in Least Mean Square (LMS) filters.
5. How does the choice of regularization parameter impact the performance of LMS filters?
6. What is the significance of noise variance estimation in image restoration?
7. Explain the concept of inverse filtering in image restoration.
8. How does Constrained Least Squares Restoration address the ill-posed nature of image restoration problems?
9. What are some common constraints applied in Constrained Least Squares Restoration?
10. Discuss the trade-off between spatial resolution and noise suppression in image restoration.
11. How do interactive restoration techniques involve user interaction in the restoration process?
12. What role does the Point Spread Function (PSF) play in image restoration?
13. How does Wiener filtering differ from other restoration methods?
14. Describe the iterative nature of some restoration algorithms.
15. What challenges are associated with blind image restoration techniques?
16. How does total variation regularization promote piecewise smoothness in restored images?
17. What are the limitations of using traditional least squares methods in image restoration?
18. Discuss the concept of spatial regularization in image restoration.
19. How do non-local methods utilize image redundancies in restoration?
20. Explain the role of the Gaussian noise model in image restoration.
21. How does Tikhonov regularization mitigate the effects of noise in image restoration?
22. What are some strategies for estimating the blur kernel in blind image restoration?
23. How do Bayesian methods incorporate prior knowledge into the image restoration process?
24. Discuss the importance of regularization in ill-posed inverse problems like image restoration.
25. What are some practical applications of interactive restoration techniques in real-world scenarios?

26. What is image segmentation, and why is it important in computer vision?
27. How does image segmentation differ from object detection?
28. Describe the concept of discontinuities in image processing.
29. What methods are commonly used for detecting discontinuities in images?
30. Explain the role of edge linking in boundary detection.
31. How does thresholding contribute to image segmentation?
32. Describe the challenges associated with thresholding in image segmentation.
33. What are the advantages of using adaptive thresholding over global thresholding?
34. Explain the concept of region-oriented segmentation in image processing.
35. How does region growing differ from region splitting and merging in image segmentation?
36. What role do watershed algorithms play in image segmentation?
37. Describe the difference between boundary-based and region-based segmentation techniques.
38. How does the Hough transform contribute to edge detection and line detection?
39. Discuss the advantages of using the Canny edge detector over other edge detection techniques.
40. Explain the concept of non-maximum suppression in edge detection.
41. What is the role of gradient magnitude and orientation in edge detection?
42. How do Gaussian smoothing and differentiation contribute to edge detection?
43. Describe the concept of edge linking in the context of image processing.
44. Discuss the challenges associated with edge detection in noisy images.
45. What role does scale play in edge detection algorithms?
46. How do zero-crossing detectors contribute to edge detection in images?
47. Explain the concept of edge thinning in image processing.
48. What are the advantages of using morphological operations in edge detection?
49. How does the choice of edge detection algorithm affect the detection of curved edges?
50. Describe the concept of gradient-based edge detection.
51. What are the limitations of using gradient-based edge detectors?
52. How does the Laplacian of Gaussian (LoG) edge detector differ from other gradient-based methods?
53. Explain the concept of edge detection thresholding.
54. Discuss the challenges of edge detection in images with varying illumination.
55. How do canny edge detectors overcome the limitations of gradient-based edge detectors?

56. What role does hysteresis thresholding play in the Canny edge detector?
57. Explain the concept of edge orientation histograms in edge detection.
58. How does the Marr-Hildreth edge detector differ from the Canny edge detector?
59. Describe the concept of texture-based edge detection.
60. What are the challenges of edge detection in images with low contrast?
61. How does the use of steerable filters improve edge detection performance?
62. Discuss the concept of edge curvature estimation in edge detection.
63. What role does spatial smoothing play in edge detection algorithms?
64. Explain the concept of edge thinning in skeletonization algorithms.
65. How do edge detection algorithms handle junctions and intersections in images?
66. What role does non-maximum suppression play in the Sobel edge detector?
67. Describe the concept of multi-scale edge detection.
68. Discuss the trade-offs between computational complexity and edge detection accuracy in real-time applications.
69. How does edge detection contribute to feature extraction in pattern recognition?
70. What are the limitations of using Laplacian-based edge detectors?
71. Explain the concept of directional edge detection.
72. How does edge detection contribute to image registration and alignment?
73. Discuss the role of edge detection in image segmentation.
74. How do edge detection algorithms handle noise and artifacts in images?
75. Describe the concept of edge localization accuracy in edge detection.
76. What are the primary redundancies targeted in image compression?
77. How do fidelity criteria influence the quality of compressed images?
78. Name a commonly used image compression model.
79. Explain the role of a source encoder in image compression.
80. What distinguishes error-free compression from lossy compression methods?
81. Describe lossy compression in image processing.
82. How does Huffman coding contribute to image compression?
83. What role does quantization play in image compression?
84. Compare transform-based compression methods with predictive coding.
85. How does Run-Length Encoding (RLE) aid in image compression?
86. Discuss the significance of entropy coding in lossless compression.
87. What distinguishes PNG from other image compression formats?
88. Explain the role of Discrete Cosine Transform (DCT) in JPEG compression.
89. How does JPEG compression handle color information?

90. Discuss the advantages of using vector quantization in image compression.
91. What are some common artifacts introduced by lossy image compression?
92. How does wavelet compression differ from traditional methods like JPEG?
93. Describe the role of chrominance subsampling in JPEG compression.
94. How does the quality factor affect JPEG compression?
95. Discuss the importance of fidelity criteria in image compression.
96. Explain the concept of spatial redundancy in image compression.
97. What are some challenges associated with error-free compression techniques?
98. How does predictive coding reduce redundancy in image compression?
99. Describe the role of entropy in lossless compression.
100. How does the choice of color space impact image compression?
101. Explain the concept of entropy in the context of image compression.
102. What are some advantages of using predictive coding in image compression?
103. How does the choice of compression algorithm affect image quality?
104. Discuss the role of quantization tables in JPEG compression.
105. How does image compression impact computational complexity during encoding and decoding?
106. What techniques are used to remove spectral redundancies in image compression?
107. How do image compression models like JPEG 2000 improve upon the original JPEG standard?
108. Describe the concept of entropy in relation to lossy compression.
109. What are some limitations of using lossy compression in medical imaging?
110. How does wavelet compression compare to DCT-based compression methods like JPEG?
111. Discuss the trade-offs between compression ratio and image quality in lossy compression.
112. What factors influence the choice between lossless and lossy compression methods?
113. Explain the concept of fidelity criteria and its role in image compression.
114. How does the choice of compression algorithm impact computational resources during encoding and decoding?
115. Describe the role of chrominance subsampling in reducing file size in JPEG compression.
116. What are some commonly used techniques for error-free compression?

117. How does the choice of color space affect image compression efficiency?
118. Explain the concept of fidelity criteria and its importance in medical imaging.
119. How does the choice of compression algorithm impact the ability to recover original image data in lossless compression?
120. Describe the role of entropy coding in lossless compression.
121. What are some techniques used for removing spatial redundancies in image compression?
122. How does the choice of compression algorithm impact the ability to recover original image data in lossy compression?
123. Explain the concept of fidelity criteria and its role in video compression.
124. What are some challenges associated with error-free compression methods in practical applications?
125. How does the choice of compression algorithm impact the computational complexity of image compression?