Anna University , Chennai
B.E./B.Tech. Degree Examination, November/December 2012
Seventh Semester
Electronics and Communication Engineering
EC 2029/EC 708 - Digital Image Processing
(Regulation 2008)
Time: Three hours
Maximum : 100 marks
Answer ALL questions

Part A - (10 * 2 = 20 marks

1. What is meant by brightness and contrast?
2. Justify that KLT is an optimal transform.
3. What are the types of image enhancement available?
4. Mention the procedure involved in marker selection.
5. What is bit plane slicing?
6. List out the coding systems defined in JPEG standard.
7. Why the image is subjected to Wiener filtering?
8. How are shift codes generated?
9. Define Sobel operator.
10. Write the Hadamard transform matrix Hn for n = 3.

Part B - (5 * 16 = 80 marks)

11. (a) (i) Explain any four basic relationships between pixels.(8 marks)
11. (a) (ii) What are the different transforms used in DIP? Explain the most advantageous one in detail.(8 marks)
Or
11. (b) (i) What is a frame buffer? Discuss the categories of digital storage for image processing applications.(8 marks)
11. (b) (ii) Describe in detail about the elements of digital image processing system.(8 marks)

12. (a) What is histogram equalization? Discuss in detail about the procedure involved in histogram matching.(16 marks)
Or
12. (b) (i) Specify the expressions for the following filters.
1. Geometric mean filter
2. Harmonic mean filter
3. Contraharmonic mean filter (6 marks)
12. (b) (ii) Write notes on Homomorphic filtering.(10 marks)

13. (a) (i) What is gray level interpolation? Explain the schemes involved in it.(8 marks)
13. (a) (ii) Differentiate constrained and unconstrained restoration.(8 marks)
Or

13. (b) Write notes on
1. Inverse Filtering
2. Least square error filter (16 marks)

14. (a) (i) Explain global processing using Hough transform.(8 marks)
14. (a) (ii) What do you understand by dilation and erosion in morphological operation? Explain in detail.(8 marks)
Or
14. (b) (i) Discuss in detail about the threshold selection based on boundary characteristics.(8 marks)
14. (b) (ii) Elaborate the process of dam construction along with the watershed segmentation algorithm.(8 marks)

15. (a) Determine the Huffman code assignment procedure for the following data. Compute the average length of the code and the entropy of the source. Is Huffman code uniquely decodable? If so, justify your answer. (16 marks)
Or
15. (b) (i) Discuss the methods of constructing the masking function based on maximum variance and maximum magnitude.(8 marks)
15. (b) (ii) Draw and explain the block diagram of MPEG encoder.(8 marks)