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Seventh Semester B.E. Degree Examination, December 2010
Image Processing

Time: 3 hrs.

Max. Marks:100

- Note: 1. Answer any FIVE full questions, selecting at least TWO questions from each part.**
2. Missing data may be suitably used.
3. Draw neat diagrams wherever necessary.

PART - A

- 1 a. Explain the process of image acquisition, using sensor strips and sensor arrays. (12 Marks)
 b. Explain the following terms :
 i) Adjacency ; ii) Connectivity ; iii) Gray level resolution ; iv) Spatial resolution. (08 Marks)
- 2 a. Explain the process of image sampling and quantization in the digital image formulation. (10 Marks)
 b. Explain some of the widely used gray - level transformations. (10 Marks)
- 3 a. Explain the histogram equalization technique for image enhancement. Also give the digital formation for the same. (10 Marks)
 b. Perform histogram equalization of the image, (10 Marks)

4	4	4	4	4
3	4	5	4	3
3	5	5	5	3
3	4	5	4	3
4	4	4	4	4

- 4 a. Explain the homomorphic filtering approach for image enhancement. (10 Marks)
 b. Compute the median value of the marked pixels shown in the Fig.Q.4(b), using a 3 x 3 mask. (10 Marks)

Fig.Q.4(b).

18	22	33	25	32	24
34	128	24	172	26	23
22	19	32	31	28	26

PART - B

- 5 a. Explain HADAMARD transform and its applications. (10 Marks)
 b. Compute the Discrete Cosine Transform (DCT) matrix for N = 4. (10 Marks)
- 6 a. Define the process of image restoration. Explain the order statistics filter for restoring images in the presence of noise. (10 Marks)
 b. Explain the following methods to estimate the degradation function, used in image restoration : i) Estimation by image observation ; ii) Estimation by experiment ; iii) Mathematic modelling. (10 Marks)
- 7 a. Explain the following color models : i) RGB color model ; ii) HIS color model. (10 Marks)
 b. Explain the procedure in converting colors from RGB to HIS and vice versa. (10 Marks)
- 8 Write short notes on :
 a. Noise models ;
 b. Smoothing frequency domain filters.
 c. Power - law transformation ;
 d. KL transform. (20 Marks)
