Code No. : 3136

[Max. Marks: 75

swer five questions from Part - B.

FACULTY OF ENGINEERING B.E. 4/4 (ECE) I Semester (Main) Examination, December 2010 DIGITAL IMAGE PROCESSING (Elective – I)

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Time : 3 Hours]

Note : Answer all questions from

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1.	Define digital image. How do you represent, binary, grey level and range digital image?	3
2.	Give the details about image formation model.	2
3.	What is Histogram and classify Histograming techniques? Draw the block diagram of Histogram modelling.	3
4.	Define Image enhancement. List various image enhancement technique.	3
5.	Draw the block diagram of Image restoration.	2
6.	Explain contrast stretching.	2
7.	Define cosine transform. List its advantages.	3
8.	Explain the need for Image compression and list few image compression techniques.	2
9.	Define data redundancy and compression ratio. Give mathematical expressions for both.	3
10.	Give mathematical equations for logarithmic law, power law as referred to luminance to contrast model	2
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PART – B

(50 Marks)

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- 11. a) With a neat block diagram explain the fundamental steps in image processing. 4
 - b) Explain distance measure and different types of connectvity in pixel relationships.

Calculate $D_4 D_8$ and Dm between p and f in the following image. Given V={0.1}

- 1. Define digital image. How do you represent, binary, grey level {1} 2 0 1
- 0 1 2 1
- 1 3 0 2
- What is Histogram and classify Histograming techniques? Draw (2 0 1 {q}1
- 12. a) What is the significance of 2DDFT? What is shifting property of 2DDFT?
 - b) List various image transform. Give basis vectors for 8×8 HAAR and cosine transform. Give 8×8 HAAR transform matrix and sequences.
- 13. a) Define Histogram modelling and Histogram equalization. Draw necessary block diagrams.
 - b) Explain median filtering. Give its algorithm. Give the properties of median filter
 - Let $\{y(m)\} = \{2, 3, 8, 4, 2\}$ and noise required by your barries of the second of $W = \{-1, 0, 1\}$.

Find the median filter output. Simultaneous and another point another sold of 6



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- 14. a) Explain Inverse filtering and Weines filter. Draw the blokdiagram of Digital implementation of weines filter.
 - b) Explain with a neat diagram the spatial filtering technique.
 - c) How is speckle noise removed?
- 15. a) Distinguish between losses and lossless compressions of images. Illustrate with necessary block diagrams and necessary equation.
 - b) Explain Huffman coding give its algorithm. Illustrate your answer with tree structure.
- a) Explain FFT and give its properties. Draw the diagram of implementation of successive algorithm. Define DCT. Give its basis vector.
 - b) Explain transform coding techniques.
- 17. Write detailed notes on :
 - a) Image degradation models.
 - b) Arithmetic coding
 - c) Spatial averaging marks.