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Reg. No. : .....

Name : .....

Sixth Semester B.Tech. Degree Examination, April 2014
(2008 Scheme)
08.626 (Elective – II) : DIGITAL IMAGE PROCESSING (TA)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **4** marks.

1. State 2D convolution property with proof.
2. Define Mach band effect.
3. Compare Kh transform with Hadamard transform.
4. Define block Toeplitz matrix.
5. State the equations used for image enhancement using Laplacian filters.
6. What are inverse filters ?
7. Define the terms coding redundancy and interpixel redundancy.
8. What are shape numbers ?
9. How gray scale morphology differs from binary morphology ?
10. What are Sobel operators ? **(10×4=40 Marks)**

PART – B

Answer **2** questions from **each** Module. **Each** question carries **10** marks.

MODULE – I

11. Find unit sample response h(m, n) for a lowpass filter with frequency response

$$H(w_1, w_2) = 1 \quad |w_1| \le a, \; |w_2| \le b$$
$$= 0 \quad \text{otherwise.}$$

P.T.O.

12. Compute 2D DFT of 4 × 4 grey scale image.

$$f(m,n) = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

13. State and prove the periodicity property and spatial shift property of 2D DFT.

MODULE – II

14. How contrast enhancement is achieved using histogram equalization ?

15. Explain spatial filters and mean filters used for image restoration with an example.

16. Derive a mathematical model for the type of degradation caused by blurring.

MODULE – III

17. Describe any 2 types of image compression methods.

18. How edge detection is achieved using gradient operators ? Describe.

19. Describe on 2 methods used for representation and description of images.

(10×6=60 Marks)