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Roll No .....

CS - 8302

B.E. VIII Semester

Examination, June 2015

Digital Image Processing

(Elective-III)

Time : Three Hours

Maximum Marks : 70

Note : Attempt one question (Including all parts) from each unit. All questions carry equal marks.

UNIT-I

1. a) Define digital image? Explain the components of general purpose image processing system.

   b) What is half toning technique? Give the logic to implement a half toned image from a gray - level image.

OR

2. a) Explain the significance of sampling and quantization in DIP.

   b) Consider image segment shown:

$$\begin{matrix} 3 & 1 & 2 & 1^{(q)} \\ 2 & 2 & 0 & 2 \\ 1 & 2 & 1 & 1 \\ {}_{(P)}1 & 0 & 1 & 2 \end{matrix}$$

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Let V = {0,1} and compute the lengths of the shortest 8 – and m – path between p and q. If a particular path does not exist between these points explain why.

UNIT-II

3. a) A 2-Dimensional DFT can be obtained using a 1- dimensional DFT algorithm twice. Explain.

   b) Write short notes on:

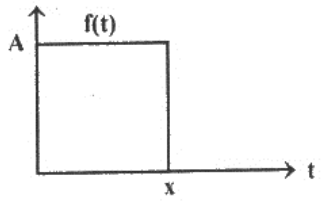
   i) Walsh transform

   ii) Hadamard transform

OR

4. a) Explain convolution in the spatial and the frequency domain. Explain the relevance of each in image processing.

   b) Derive the Fourier transform of the given pulse. Explain the Fourier spectrum that you obtain.



UNIT-III

5. a) If $x = \{2, 3, 4, 3, 4, 5, 6\}$ and $w = \{-101\}$ perform median filtering.

   b) Equalize the given histogram.

Gray - level	0	1	2	3	4	5	6	7
No.of pixels	790	1023	850	656	329	245	122	81

OR

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6. a) Explain the difference between operations involving 3×3 mask for median filtering and average filtering.

   b) What would happen to the dynamic range of an image if all the slopes in the contrast structured algorithm (*l*,m,n) are less than 1. Answer using an example.

UNIT-IV

7. a) Discuss the method of edge detection. Show prewitt and sobel masks are used for detecting diagonal edges.

   b) Explain Global and adaptive thresholding techniques.

OR

8. a) Write the algorithm to estimates the thresholding values.

   b) What is image segmentation? Explain region growing technique of segmentation.

UNIT-V

9. a) What are various arithmetic and logical operations performed on images?

   b) Explain opening and closing operations on images by using suitable example.

OR

10. a) Explain how HIT - OR - MISS transformation is used for finding local patterns of pixels.

    b) What is meant by morphology? Explain some basic morphological operations.

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