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Code No: EC1552

GEC-R14

IV B. Tech I Semester Supplementary Examinations, February 2018

DIGITAL IMAGE PROCESSING

(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 60

Note: All Questions from **PART-A** are to be answered at one place.

Answer any **FOUR** questions from **PART-B**. All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. Find the height of a retinal image if a 10 m high structure is observed from 50 m.
2. State parseval's relation for an image.
3. Draw a 3x3 spatial filter mask for high pass filtering.
4. a) Purpose of image restoration is to gain
 - i) degraded image ii) original image iii) pixels iv) coordinates
- b) Process of image restoration using an estimated degradation function is called
 - i) blind convolution ii) convolution iii) correlation iv) none of these
5. Define global, local and adaptive thresholds.
6. Distinguish between Lossy and Lossless compression.

PART-B

4 × 12 = 48M

1. a) Explain about connectivity of pixels in an image. (6M)
- b) Consider the image segment shown below

0	1	1	1
1	0	0	1
1	1	1	1 (q)
(p) 1	1	1	1

Let $V = \{0, 1\}$. Compute D4, D8 distances between p & q whose coordinates are (3, 0) and (2, 3) respectively. (6M)

2. a) Generate the Hadamard Transform for N=4. (8M)
- b) Write the properties of Hadamard Transform. (4M)
3. Perform histogram specification on 8x8 image shown below:

Gray level	0	1	2	3	4	5	6	7
Number of pixels	8	10	10	2	12	16	4	2

Specified histogram:

Gray level	0	1	2	3	4	5	6	7
Number of pixels	0	0	0	0	20	20	16	8

(12M)

4. a) Explain about the following noise models
- i) Gaussian noise ii) Rayleigh noise iii) Gamma noise (6M)
- b) Explain about the following mean filters
- i) Arithmetic mean ii) Geometric mean (6M)
5. a) Explain the use of motion in segmentation using spatial techniques. (6M)
- b) Describe watershed segmentation algorithm. (6M)
6. Draw the block diagram of general image compression system model and Explain in detail. (12M)
