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Code No. : 41324 S

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. (E.C.E.) IV Year I-Semester Supplementary Examinations, May-2019**

**Digital Image Processing**

(Elective-I)

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2 = 20 Marks)**

1. Distinguish between binary and intensity images.
2. Give the process for representing digital images.
3. What is the basic principle of Threshold coding?
4. Define slant transform and give its application.
5. What is the need for contrast stretching in image processing?
6. What is image enhancement? List different image enhancement techniques.
7. Explain the process for image restoration.
8. Write the mathematical model for image degradation.
9. Define compression ratio. Give its importance in image processing.
10. Explain Bit plane coding.

**Part-B (5 × 10 = 50 Marks)**

11. a) Draw the block diagram of digital imaging system and explain each block in detail. [5]  
b) Explain "neighbors of pixels" with respect to pixels in a digital image. [5]
12. Determine the sequency, by generating on 8X8 Hadamard transform co-efficient matrix. [10]
13. a) What is Haar Transform? List the properties and applications of Haar Transform. [5]  
b) Construct a histogram of the gray levels of the pixels in the following image: [5]

3	4	2	0	0
1	1	4	0	0
0	2	4	1	1
0	0	1	4	2
0	0	1	2	5

14. Discuss about Constrained least squares method of image restoration in detail with relevant equations. [10]
15. a) Describe the salient features of arithmetic coding. [4]  
b) A message has four symbols a1, a2, a3 and a4. They are to be transmitted in the sequences of a1, a2, a3, a3, a4. Obtain the encoding sequence and the arithmetic coding for the sequence to be transmitted. [6]
16. a) Explain "distance measurement" in a digital image with respect to pixels. [5]  
b) What are separable and non-separable transforms? Explain with an example. [5]
17. Write short notes on any *two* of the following:
  - a) Homomorphic filtering [5]
  - b) Image degradation model. [5]
  - c) Zonal and threshold coding. [5]

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