USN ☐☐☐☐☐☐☐☐☐☐   **10EC763**

Seventh Semester B.E. Degree Examination, Dec.2018/Jan. 2019
Image Processing

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
atleast TWO questions from each part.

PART – A

1 a. What are the fundamental steps of digital image processing?   **(12 Marks)**
   b. Explain brightness adaptation and discrimination.   **(08 Marks)**

2 a. Explain image acquisition using single sensor and senor strips with necessary diagrams.
                                                                              (12 Marks)
   b. What do you understand by image sampling and quantization?   **(08 Marks)**

3 a. Mention 2-dimensional orthogonal transform for an image.   **(05 Marks)**
   b. Define separable unitary transforms.   **(05 Marks)**
   c. Explain 5-properties of 2-D DFT.   **(10 Marks)**

4 a. Define 2-D forward and inverse discrete sine transform and mention its properties.
                                                                              (10 Marks)
   b. Generate (4 × 4) slant transform matrix given the core matrix $s_1 = \frac{1}{\sqrt{2}}\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}$. Also

   mention its properties.   **(10 Marks)**

PART – B

5 a. What do you mean by image enhancement? Explain 3 types of basic intensity level
      transformations.   **(10 Marks)**
   b. A 3 bit image of size 64 × 64 has intensity distribution as shown in table. Implement
      histogram equalization and plot the same.   **(10 Marks)**

Gray level	0	1	2	3	4	5	6	7
Number of pixels	790	1023	850	656	329	245	122	81

Table Q5(b)

6 a. With necessary block diagram. Explain fundamental steps used in frequency domain
      enhancement.   **(08 Marks)**
   b. Briefly explain homomorphic filtering and its implementation.   **(12 Marks)**

7 a. Differentiate between image restoration and image enhancement. Briefly explain the image
      degradation model.   **(10 Marks)**
   b. With necessary mathematical equation, explain different noise model. How will you remove
      the noise in an image?   **(10 Marks)**

8 a. Describe the RGB color model. How their color can be converted to HSI color model?
                                                                              (10 Marks)
   b. What is pseudo color image processing? How does a gray image covert into color image?
                                                                              (10 Marks)

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