10EC763 – Image Processing
Assignment-I

Note:  
   i) Write the assignment in a A4 size paper  
   iii) Mention your USN, name and section on the top right corner of first page  
   ii) Submit the assignment on or before 11.00 AM, Tuesday, 12/09/2017

1. Explain the fundamental steps in digital image processing.
2. With examples, explain various energy sources for image capturing.
3. Explain the differences between image enhancement and restoration.
4. With the help of a neat figure, explain the main elements of the human eye.
5. What is Scotopic and Photopic vision? Why can’t the human eye identify colors under dim light conditions?
6. Write a short note on:  
   i. Brightness adaptation and discrimination  
   ii. Mach band effect
7. Explain Spatial Resolution and Intensity level resolution.
8. Explain the following terms used in image processing:  
   i. Adjacency and its types  
   ii. Distance measures  
   iii. Connectivity  
   iv. Region  
   v. Edge
9. Consider the two image subsets, S1 and S2, shown in the following figure. For V={1}, determine whether these two subsets are (a) 4-adjacent, (b) 8-adjacent, or (c) m-adjacent.

10. Consider the image segment shown. Let V={7, 8} and compute the lengths of the shortest 4-, 8-, and m-path between p and q. If a particular path does not exist between these two points, explain why. Repeat for V={5,6,7}.

12. Explain image enhancement using Arithmetic/ Logic Operations
13. Write a short note on Piecewise-Linear Transformation Functions
14. Explain some of the basic grey level transformation functions used for image enhancement
15. What can we infer from histogram of an image and how can we improve the contrast automatically without human intervention?