CBCS SCHEME

USN | | | | | | | | | | |

15EC72

Seventh Semester B.E. Degree Examination, June/July 2019
Digital Image Processing

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Mention thematic bands in NASA's LANDSAT satellite, its wavelength and uses. **(05 Marks)**

b. Consider the image segment shown in Table. Q1(b), compute the length of the shortest 4, 8 and m-path between P and Q for (i) V = {2, 3, 4}. **(06 Marks)**

	3	4	1	2	0
	0	1	0	4	② Q
	2	2	3	1	4
P	③	0	4	2	1

c. Explain the process of image acquisition using single sensor with motion to generate a 2 – D image. **(05 Marks)**

OR

2 a. Explain the process of generating a digital image. **(05 Marks)**

b. Discuss the most commonly used distance measures in image processing. **(06 Marks)**

c. With the mathematical equation, explain the bicubic interpolation. **(05 Marks)**

Module-2

3 Explain the following intensity transformation functions :

a. Image negatives **(05 Marks)**

b. Log transformation **(05 Marks)**

c. Power – law transformation. **(06 Marks)**

OR

4 a. For the given 4 × 4 image of Table Q4(a) having gray scale between 0 to 9, perform histogram equalization and draw the histogram of image before and after equalization. **(08 Marks)**

2	3	3	2
4	2	4	3
3	2	3	5
2	4	2	4

Table. Q4(a)

b. Explain the image smoothing in frequency domain using ideal low pass filter. **(08 Marks)**

Module-3

5 a. What are the most commonly used probability density functions in image processing applications and explain it with the help of plot. **(08 Marks)**
b. With the mathematical equations, discuss the minimum Mean Square Error Filtering. **(08 Marks)**

OR

6 a. Explain the process of restoration in the presence of noise only using spatial filtering for various mean filters. **(08 Marks)**
b. What are the three principal ways to estimate the degradation function for use in image restoration and explain it? **(08 Marks)**

Module-4

7 a. Explain the process of generating RGB image. **(08 Marks)**
b. Write the formulas used for converting RGB to HSI. Using these formula find the value of HSI for the given RGB = (0.683, 0.1608, 0.1922). **(08 Marks)**

OR

8 a. Draw the block diagram for converting gray level intensity to color transformation and explain it. **(08 Marks)**
b. What is image pyramids? Explain the system for creating approximation and prediction residual pyramids. **(08 Marks)**

Module-5

9 a. Explain image gradient and gradient operators for Edge detection. **(08 Marks)**
b. Discuss the process of region splitting and merging for region based segmentation. **(08 Marks)**

OR

10 a. Write the steps to be followed for developing algorithm for a given binary region R and example it. **(08 Marks)**
b. Mention the aberrations of Minimum Perimeter Polygons (MPP) algorithm and explain it. **(08 Marks)**

* * * * *