Seat No. : _____

NC-140

December-2015

5th Year M.Sc. (CA & IT)

(Image Processing)

Time : 3 Hours] **[Max. Marks : 100**

1. Answer **all** : **4 × 5 = 20**
   (1) Explain the steps of digital image processing along with a block diagram.
   (2) Define : Electromagnetic spectrum. Explain it in terms of frequency, wavelength and energy.
   (3) Explain achromatic light and chromatic light along with their attributes.
   (4) Write short note on image formation model.

2. Answer any **four** : **4 × 5 = 20**
   (1) Write the steps for implementation of histogram specification.
   (2) Write the formula for sharpening spatial filters. List the observations of first and second order derivative.
   (3) Write short note on image addition and image subtraction.
   (4) Write short note on zooming and shrinking images.
   (5) Explain neighbours of pixel and adjacency. Write the conditions for m-adjacency.

3. Answer any **four** : **4 × 5 = 20**
   (1) Explain unsharp masking and high boost filtering.
   (2) What is the difference between global enhancement and local enhancement ? Explain briefly the working of AND, OR and NOT operations.
   (3) Write the formula for 1D and 2D discrete Fourier transform and its inverse. Write down the properties of frequency domain.
   (4) Write a brief short note on Image degradation/Restoration process along with the block diagram.
   (5) Define : White Noise and Periodic Noise. Write the formula for the different types of order statistics filters.

4. (A) Write the algorithm for Adaptive median filter. Explain the working of the algorithm. **10**

(B) Answer any **two** : **2 × 5 = 10**

(1) Write short note on Colour Transformations.

(2) What is pseudo colour image processing ? Explain intensity slicing in detail.

(3) Define : Chromaticity. Explain how you will obtain Hue, Saturation and Intensity from RGB.

5. Answer **all** : **4 × 5 = 20**

(1) Explain Coding Redundancy and Psychovisual Redundancy.

(2) What do you mean by fidelity criteria ? Explain the two types of fidelity criteria.

(3) Explain application of image processing in the fields of medical imaging and biometrics.

(4) Explain briefly with example lossy and lossless compression. Write down the different bitmap file formats.

———————