Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.TECH(ECE-COMM)/SEM-2/MCE-205B/2012

2012

IMAGE PROCESSING & PATTERN RECOGNITION

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer Q. No. 1 and any *four* from the rest.

1. Choose the correct alternatives for the following : $14 \times 1 = 14$

   i) The process of extraction information from the image is called as

      a) image enhancement b) image restoration

      c) image analysis d) image compression.

   ii) An image is considered to be a function of $a(x, y)$ where a represents

      a) height of image b) width of image

      c) amplitude of image d) resolution of image.

   iii) Which is the image processing technique used to improve the quality of image for human viewing ?

      a) Compression b) Enhancement

      c) Restoration d) Analysis.

iv) Which type of enhancement operations are used to modify pixel values according to the value of the pixel's neighbors ?

a) Point operations b) Local operations

c) Global operations d) Mask operations.

v) Image compression is

a) making image look better

b) sharpening the intensity-transition regions

c) minimizing degradation over image

d) reducing the redundancy of the image data.

vi) What algorithm is used in fingerprint technology ?

a) Intensity based algorithm

b) Pattern based algorithm

c) Feature based algorithm

d) Recognition algorithm.

vii) Which technique is used to determine changes between two images ?

a) Image differencing b) Segmentation

c) Skin texture analysis d) Image differencing.

viii) An image is converted to two-dimensional matrix of pixel values by

a) pixel grabber b) bough transform

c) masking d) none of these.

ix) The initial step in any image processing technique is

a) segmentation b) masking

c) image acquisition d) normalization.

x) Raster scanning starts from

a) top left corner of the screen

b) top right corner of the screen

c) bottom left corner of the screen lines

d) bottom right corner of the screen.

xi) What will be the size of 1200 × 1600 image of 16 bit depth ?

a) 29·29 MB b) 117 kB

c) 192 kB d) None of these.

xii) RLE stands for

a) Reverse Line Encoding

b) Run Length Encoding

c) Run Line Encoding

d) none of these.

xiii) Histogram stretching is a process of

a) image enhancement b) image recognition

c) image fusion d) image segmentation.

xiv) Which among the following image processing techniques is fast, precise and flexible ?

a) Optical b) Digital

c) Electronic d) Photographic.

2. Describe *K*-Means Clustering Algorithm with advantages and disadvantages. 10 + 2 + 2

3. What do you mean by Hierarchical clustering ? What is the significance of crossover & mutation over GA algorithm ? Describe Fuzzy *C*-Mean Clustering with limitation. 2 + 2 + 2 + 8

4. Discuss about gray level image and 24-bit true RGB colour image. Describe JPEG compression technique. 2 + 4 + 8

5. What are histogram and histogram equalization ? Give example. What do you mean by Contrast Enhancement ? Say something about Run Length Encoding. What is Region Adjacency Graph ? 2 + 2 + 3 + 4 + 3

6. What is QBIR ? Draw the usefulness of KDB tree and Quad tree. Give some techniques for edge detection. 2 + 3 + 3 + 6

7. Draw the utility of natural grouping. Write down the algorithm for MST using *K*-Means algorithm and ISODATA algorithm. 2 + 6 + 6

==========