

Total No. of Questions : 12]

SEAT No. :

P1387**[4759]-89****[Total No. of Pages : 3****B.E. (E & TC)****DIGITAL IMAGE PROCESSING****(2008 Course) (Semester - I) (Elective -I)****Time : 3 Hours]****[Max. Marks :100****Instructions to the candidates:**

- 1) Answer three questions from each section.(Section-I Q 1 or Q 2, Q 3 or Q 4, Q5 or Q 6 and Section -II Q7 or Q 8, Q 9 or Q 10, Q 11 or Q 12 .
- 2) Answers to the two sections should be written in separate answer books.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Figures to the right indicate full marks.
- 5) Use of logarithmic tables, slide rule, electronic and pocket calculator is allowed.
- 6) Assume suitable data, if necessary.

SECTION - I**Q1) a) Explain the following terms w.r.t. digital image: [10]**

- | | |
|--------------------------|------------------------|
| i) Pixel | ii) 4- connectivity |
| iii) Spatial resolution | iv) Euclidean distance |
| v) Gray level resolution | |
- b) With the help of block diagram explain the typical image processing system. [8]

OR**Q2) a) Define and explain following terms w.r.t. Digital image: [10]**

- | | |
|------------------------|--|
| i) Mean | |
| ii) Standard deviation | |
| iii) Variance | |
| iv) SNR | |
| v) PSNR | |
- b) Explain the image sensing and acquisition techniques. [8]

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- Q3)** a) Explain power law (gamma) intensity transformation. Explain its advantages over log transform. [8]
- b) What is pseudo coloring? Explain pseudo coloring of Gray scale image. [8]

OR

- Q4)** a) What is histogram? Explain the histogram equalization algorithm. [8]
- b) Explain how Laplacian of Gaussian can be used for image enhancement. [8]

- Q5)** a) A 2 x 2 block of image is given as:

$$\begin{bmatrix} 20 & 13 \\ 20 & 01 \end{bmatrix}$$
 Determine its DCT coefficients. [8]

- b) What is KL Transform? Discuss its properties and applications. [8]

OR

- Q6)** a) Write a note on Haar Transform. [8]
- b) Compare DFT and DCT. State their application areas. [8]

SECTION - II

- Q7)** a) Explain the lossless predictive coding with the help of encoder and decoder block diagram. [8]
- b) What are the different Redundancies found in Digital image for compression? Explain in detail. [10]

OR

- Q8)** a) What is JPEG? Explain JPEG digital image compression technique in detail. [8]
- b) Draw and explain the image compression system block diagram. [6]
- c) What is Run length coding? Explain with suitable example. [4]

- Q9)** a) Explain the chain code and B-Splines for boundary representation. [8]
 b) Explain the Morphological Image Processing with respect to (w.r.t.) Erosion, Dilation, Opening and Closing on Binary image. [8]

OR

- Q10)** a) Compare the performance of first and second derivative w.r.t. an image. Which will you prefer for detecting edges? Why? [8]
 b) With the help of suitable mask explain the following: [8]
 i) Point detection
 ii) Line detection
 iii) Edge detection

- Q11)** a) With the help of diagram explain the image degradation model. What is the need of degradation model? [8]

- b) Explain the algorithm for Character Recognition in image processing. [8]
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OR

- Q12)** a) With the help of block diagram explain all steps for Fingerprint Identification system in image processing. [10]

- b) Explain the difference between image enhancement and restoration. List the various techniques used for image restoration. [6]

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