P3831

[5561]-252

B.E. (Electronics and Telecommunication Engineering)
DIGITAL IMAGE PROCESSING
(2012 Course) (Elective-I) (Semester - I) (404184A)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:

1)   *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.*
2)   *Figures to the right indicate full marks.*
3)   *Assume suitable data, if necessary.*
4)   *Use of electronic pocket calculator is allowed.*

Q1) a)   Explain spatial and gray level resolution in image processing.   **[3]**

   b)   What is the significance of Hue, saturation and Intensity in HSI color model?   **[3]**

OR

Q2) a)   Explain Euclidean, city block and chess board distance metrics with formula.   **[3]**

   b)   Explain image Histogram ? State its applications.   **[3]**

Q3) a)   Explain image restoration using inverse filtering.   **[4]**

   b)   Compare image enhancement in spatial domain and frequency domain.**[3]**

OR

Q4) a)   Explain image enhancement in frequency domain using block schematic.   **[3]**

   b)   Perform histogram equalization of an image.   **[4]**

$$I = \begin{bmatrix} 4 & 4 & 4 & 4 & 4 \\ 3 & 4 & 5 & 4 & 3 \\ 3 & 5 & 5 & 5 & 3 \\ 3 & 4 & 5 & 4 & 3 \\ 4 & 4 & 4 & 4 & 4 \end{bmatrix}$$

P.T.O.

Q5) a) Determine DCT coefficient of 2×2 image given below.

$$\text{Image} = \begin{bmatrix} 25 & 12 \\ 20 & 02 \end{bmatrix}$$ **[4]**

b) Define Redundancy, compression ratio and relative redundancy. **[3]**

OR

Q6) a) Explain Wavelet based image compression technique. **[4]**

b) Explain how bit plane coding is used in image compression. **[3]**

Q7) a) What is the difference between first order and second order derivative in edge detection? Explain LoG and Canny edge detection in detail. **[9]**

b) Define morphology. Explain Hit-Miss transform in morphological image processing. **[9]**

OR

Q8) a) Explain following with proper mask. **[9]**

i) Point Detection

ii) Line Detection

iii) Edge Detection

b) Explain Region Splitting and Region Merging method in region based segmentation. In which situation, split and merge technique is used? Explain. **[9]**

Q9) a) What is the significance of statistical moments? Explain first order and second order moments in detail. **[8]**

b) Explain 4-chain code and 8 chain code in detail. Also find the shape number and order of the given boundary using & chain code. **[8]**
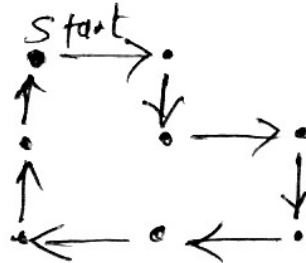
OR

Q10) a) Explain Fourier Descriptor in detail. **[8]**

b) Explain the signature and polygon approximation for boundary description. **[8]**

Q11) a) What are the different types of classification algorithms? Explain any one in detail. **[8]**

b) Write a short note on any one medical application using image processing. **[8]**

OR

Q12) a) Explain with block diagram content based image retrieval in image processing. **[8]**

b) What are pattern and pattern classes? How to represent pattern classes. **[8]**

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