

Total No. of Questions : 8]

SEAT No. :

P2270

[Total No. of Pages : 3

[5333] - 201

M.Sc.

COMPUTER SCIENCE

CS-201: Digital Image Processing

(2011 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Attempt any four from the remaining.*
- 3) *Draw a diagram wherever necessary.*
- 4) *Figures to the right indicates full marks.*

Q1) Attempt all of the following:

[8×2=16]

- a) State any two methods of generating signature.
- b) State the two basic properties of intensity values on which segmentation algorithms are based.
- c) Define reflection of a set and translation a set by point 'Z'.
- d) What is spatial filtering and Gamma correction?
- e) Harmonic mean filters work well with what type of noise?
- f) What is the difference between an edge and a boundry.
- g) Give the equations for the following:
 - i) Convolution.
 - ii) Correlation
- h) Define segmentation in HSI colour space.

P.T.O.

- Q2)** a) How is image smoothing achieved using ideal low pass filters and butter worth low pass filter? [8]
- b) What is inverse filtering? State the use of inverse filtering. [4]
- c) How are Gaussian high-pass filter used in image sharpening? [4]
- Q3)** a) Explain how degradation function and statistical characteristics of noise in restoration process are carried out using wiener filtering? [8]
- b) Define the following: [4]
- i) Rayleigh noise
- ii) Gaussian noise
- iii) Gamma noise
- iv) Exponential noise
- c) Withe example explain the concept of distance measure for pixel. [4]
- Q4)** a) What is sampling and quantization? Explain its concept with necessary diagram. [8]
- b) State boundary descriptors and explain any one of them. [4]
- c) Derive equation for power spectrum in DFT. [4]
- Q5)** a) Explain the following properties of 2D discrete fourier. [8]
- i) Translation
- ii) Rotation
- iii) Distributive
- iv) Separability
- b) Explain the basics of intensity thresholding. [4]
- c) What do you understand by segmentation? Give different methods of segmentation. [4]

- Q6)** a) What is region based segmentation? Explain it in detail. [8]
b) Write a note on following: [4]
i) Shape numbers
ii) Fourier descriptors
c) Give logic operations involving binary images. [4]
- Q7)** a) Explain HSI colour model in detail. [8]
b) What is opening and closing with reference to morphological image. [4]
c) What is digital image processing? [4]
- Q8)** a) Define and explain erosion and dilation. [8]
b) Compare RGB colour model and CMY colour model. [4]
c) Explain the role of radio band in imaging. [4]

