

Total No. of Questions : 8]

SEAT No. :

PD-4303

[Total No. of Pages : 2

[6403]-101

T.E. (E &TC)

DIGITAL IMAGE PROCESSING

(2019 Pattern) (Semester - VI) (Elective- II) (304195-A)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Your answers will be valued as a whole.
- 5) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- 6) Assume suitable data, if necessary.

Q1) a) Explain Image segmentation using. [6]

- i) Region growing.
- ii) Region Splitting.

b) With the help of suitable masks, explain the following. [6]

- i) Point detection.
- ii) Line detection.

c) Explain the following edge-detecting operators in detail. [6]

- i) Prewitt operator
- ii) Sobel operator

OR

Q2) a) What is edge detection? Compare the performance of first-order & second order derivative w.r.t. image. [6]

b) Explain the Laplacian edge detector. Explain Why the LoG mask is preferred over the Laplacian edge detector. [6]

c) What is Image thresholding? Explain Local, global, and adaptive thresholding. [6]

P.T.O.

- Q3) a)** What is data redundancy? Explain the redundancies used in image compression. [5]
b) What is the need of image compression? Explain an image compression model. [6]
c) Draw and explain JPEG base line encoder. Comment on block size used in JPEG. [6]

OR

- Q4) a)** What is lossy compression technique? Explain the DCT-based compression technique. [6]
b) Explain the need for fidelity criteria in Image compression. Write any two fidelity measures. [5]
c) Explain the concept of motion estimation with the help of any one algorithm in detail. [6]

- Q5) a)** Explain estimating the degradation function for image restoration. [6]
b) Compare in detail image enhancement and image restoration. [6]
c) Explain image restoration process with help of block diagram. [6]

OR

- Q6) a)** State noise models, Explain any one in detail. [6]
b) Explain how the Wiener filter is used in image restoration. [6]
c) Explain any three Geometric transforms in image restoration. [6]

- Q7) a)** What is a pattern in images? Explain the different pattern classes in object recognition. [6]
b) What are the methods of object recognition? Explain the recognition based on decision-theoretic methods. [6]
c) Explain in detail deep learning using CNN. [5]

OR

- Q8) a)** Explain any one algorithm of content-based image retrieval [6]
b) Write a short note on the following structural methods. [6]
 i) Matching shape numbers.
 ii) String matching.
c) Explain any one application of image processing as object recognition in detail. [5]

