Total No. of Questions : 8]

SEAT No. :

PC-1782

[Total No. of Pages :2

[6353]-101

T.E. (E & TC)

DIGITAL IMAGE PROCESSING

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

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right 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) 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]**

OR

Q2) 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

Q3) a) What is the need of image compression? Explain an image compression model. **[6]**

b) What is data redundancy? Explain the redundancies used in image compression. **[5]**

c) Explain the need for fidelity criteria in image compression. Write any two fidelity measures. **[6]**

P.T.O.

OR

Q4) a) What is lossy compression technique? Explain the DCT-based compression technique. **[6]**

b) Explain the concept of motion estimation with the help of any one algorithm in detail. **[6]**

c) Draw and explain JPEG base line encoder. Comment on block size used in JPEG. **[5]**

Q5) a) Explain image restoration process with help of block diagram. **[6]**

b) Explain any three noise models in short. **[6]**

c) Explain how the Weiner filter is used in image restoration. **[6]**

OR

Q6) a) Explain any three Geometric transforms in image restoration. **[6]**

b) Explain estimating the degradation function for image restoration. **[6]**

c) Compare in detail between image enhancement and 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 any one application of image processing as object recognition in detail. **[5]**

OR

Q8) a) Explain any one algorithm of content-based image retrival. **[6]**

b) Write a short note on the following structural methods. **[6]**

i) Matching shape numbers ii) String matching.

c) Explain in detail deep learning using CNN. **[5]**