

Total No. of Questions : 8]

SEAT No. :

P320

[Total No. of Pages : 2

[6003]-401

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.7 or 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) With reference to relation between pixels, Explain. [6]

- i) 4 connectivity.
- ii) 8 Connectivity.

b) Explain Edge detection procedure using Sobel Mask? [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) Define Image Segmentation? Explain the necessity of Image segmentation? [6]

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

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

Q3) a) Explain the need of fidelity criteria in Image compression. Write any two fidelity measure. [6]

b) Define redundancy? Explain different types of Redundancies in Image? [6]

c) What is lossless compression, Explain in detail? [5]

OR

P.T.O.

- Q4) a)** Generate Huffman code for the following data calculate efficiency of Huffman code? [6]

Gray level	Probability
a_1	0.1
a_2	0.4
a_3	0.06
a_4	0.1
a_5	0.04
a_6	0.3

- b) What is DCT? How DCT helps to achieve compression? [6]
c) Draw block diagram of JPEG coder and decoder with detail explanation? [5]
- Q5) a)** Explain image restoration process with help of block diagram? [6]
b) Explain any three noise models in short? [6]
c) Explain restoration of image in the presence of noise using spatial filtering. [6]

OR

- Q6) a)** Write a short note on image restoration using Weiner filtering? [6]
b) Explain estimating the degradation function with respect to image restoration? [6]
c) Compare in detail between image enhancement and image restoration? [6]
- Q7) a)** Explain the patterns and pattern classes in object recognition in detail? [6]
b) Explain the recognition based on decision theoretic methods? [6]
c) Explain in detail application of image processing as character recognition? [5]

OR

- Q8) a)** Write a short note on image classification? [6]
b) Write short note on following structural methods [6]
i) Matching shape numbers.
ii) String matching.
c) Explain in detail deep learning using CNN? [5]

