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]**

✡ ✡ ✡