JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- DECEMBER-2019

PhD. I Semester

COURSE CODE: 16M1WEC231

MAX. MARKS: 35

COURSE NAME: ADVANCE DIGITAL IMAGE PROCESSING

COURSE CREDITS: 3

MAX. TIME: 2 Hours

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.
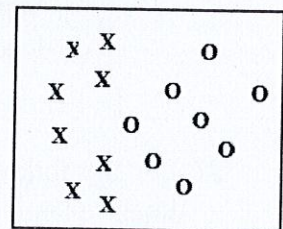

Q1. In the following three cases determine if it is possible to classify between the two classes (represented as X and O respectively) using neurons. If yes, show classification boundaries and determine the number of neurons required to classify between the two classes:
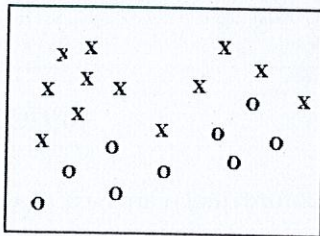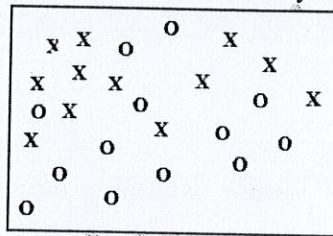
(a)   (b)   (c)

[6]CO6

Q2. For each of the following statements name the texture feature with reason that can best discriminate between the two images:
   a. Two images have the same variations in the pixel intensities but one image has red shades whereas second image has yellow shades.
   b. One image has horizontal lines whereas other image has lines oriented at angle of 45°.
   c. Object in one image has mixed intensity and it is difficult to see the proper boundaries of the objects whereas object in another image has intensity such that it is very easy to see the proper boundaries of the objects that is pixel intensities of the object is almost uniform.

[6]CO5

Q3. What do you understand by morphological operations? With the help of an example explain the operations of dilation and erosion on binary images.

[4]CO5

Q4. Explain why it is required to determine texture features from the images? Explain the steps to determine Local Binary pattern for any image.

[4]CO5

Q5. For the following image determine the GLCM matrix considering orientation at 0 degrees. Determine the values of contrast and ASM. On the basis of contrast and ASM values obtained comment if there exists any better way to describe the image quantitatively.

$$I=$$

1	3	2	1
1	3	2	1
1	3	2	1
1	3	2	1
1	3	2	1
1	3	3	1

[5]CO5

Q6. Write a short note on the following:
    a. Contrast Stretching
    b. Supervised Learning and Unsupervised Learning
    c. Learning Rate

[6]CO2 & CO6

Q7. For the following set of images determine the texture feature that can best describe the image quantitatively:

(a)	I=	0	0	0	0	**(c)**	I=	0	150	0	150

(a) I=

0	0	0	0
0	0	0	0
100	100	100	100
100	100	100	100
0	0	0	0
0	0	0	0

(b) I=

10	30	10	30
30	10	30	10
10	30	10	30
30	10	30	10
10	30	10	30
30	10	30	10

(c) I=

0	150	0	150
0	150	0	150
0	150	0	150
0	150	0	150
0	150	0	150

(d) I=

10	10	10	10
10	10	10	10
10	10	10	10
10	10	10	10
10	10	10	10
10	10	10	10

[4]CO5