B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)

Term-End Examination
June, 2014

00854

BICSE-018 : PATTERN RECOGNITION

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer any* **seven** *questions. All questions carry equal marks.*

1. How do we label the regions in an image ? Write the region-labelling algorithm.   *10*

2. Differentiate regular pattern and irregular pattern.   *10*

3. Explain the concept of statistical pattern recognition.   *10*

4. Define clustering. Give the different supervised learning methods.   *10*

5. (a) Construct a histogram of the gray levels of the pixels in the following image :   *5*

3	4	2	0	0
1	1	4	0	0
0	2	4	1	1
0	0	1	4	2
0	0	1	2	5

(b) What is the result of applying the smoothing operator $\frac{1}{3}$ $\boxed{\textcircled{1}\;|\;2}$ to the single row image with gray levels 0, 0, 0, 3, 6, 0, 0, 0 ? The circle denotes the origin of the operator. Denote undefined values with an asterisk. *5*

6. (a) Sketch key edge detection operator that will have a positive output at the right edge of an object that is brighter than the background. *5*

(b) Show a one-dimensional binomial smoothing operator with a width of seven pixels. *5*

7. How do we indicate the boundaries of image ? Also explain the analysis of region boundaries. *10*

8. Write short notes on the following :

(a) Merging segmentation *5*

(b) Splitting of boundaries *5*

9. How can a fuzzy be applied to pattern recognition ? Give the methods involved in it. *10*

10. What are the fundamentals of neural networks ? *10*

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