

**BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)**  
**B.Tech.Sem - VIII COMPUTER :SUMMER- 2022**  
**SUBJECT : IMAGE PROCESSING & PATTERN RECOGNITION**

Day : Thursday  
 Date : 16-06-2022

**S-13677-2022**

Time : 02:30 PM-05:30 PM  
 Max. Marks : 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Assume suitable data if necessary.
- 4) Use of non-programmable **CALCULATOR** is allowed.

**Q.1** Explain fundamental steps in digital image processing in detail **(10)**

**OR**

Find out 4 way connection and 8 way connection in following image

54	10	100	5
81	150	2	34
201	200	3	45
7	70	147	52

$$V = \{0, 1, 2, \dots, 10\}$$

**Q.2** Apply HPF and LPF on following image **(10)**

80	30	20
70	30	20
70	30	210

**OR**

What is filter? Explain median, mode, max filter in detail

**Q.3** Apply LZW coding on following image **(10)**

43	43	197	197
43	43	197	197
43	43	197	197
43	43	197	197

**OR**

Explain in detail Point, line and edge detection in image compression

**Q.4** Write difference between erosion and dilation of an image. **(10)**

Apply dilation on following image

$$A = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$B = \begin{bmatrix} x & x & 0 \\ 0 & \textcircled{1} & 1 \\ 0 & x & x \end{bmatrix}$$

**OR**

Explain in detail thinning and thickening of an image

**Q.5** Explain unsupervised clustering algorithm in detail **(10)**

**OR**

What is pattern recognition? Explain various techniques of pattern recognition

**Q.6** Explain Baye's classifier and Nonlinear classifier in detail **(10)**

**OR**

Write short notes on

- a) Error Probability
- b) Clustering