

M. SC. (Computer Science) SEM – I (Choice Based Credit & Grade System) : SUMMER - 2019

SUBJECT: ELECTIVE – I: c) DIGITAL IMAGE PROCESSING

Day: Monday  
Date: 15/04/2019

Time: 03.00 PM TO 06.00 PM  
Max. Marks: 60

S-2019-1247

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagrams **WHEREVER** necessary.

**Q.1** Name different types of image segmentation techniques. Explain the splitting and merging techniques with the help of an example. (15)

**OR**

Explain the following with respect to digital image processing :

- i) Image negatives
- ii) Gamma correction
- iii) Bit – plane slicing

**Q.2 A)** Answer any **ONE** of the following (08)

- a) Explain the basic elements of digital image processing with diagram.
- b) Describe the steps for filtering in the frequency domain.

**B)** Answer any **ONE** of the following (07)

- a) Explain opening and closing operations in detail.
- b) Derive equations for 2 – D discrete inverse Fourier transform .

**Q.3** Answer any **THREE** of the following (15)

- a) Explain edge linking algorithm with local processing .
- b) Given below is 'X' section of horizontal intensity profile from an image. Illustrate the first and second derivative of 1 – D digital functions represented by 'X'. Depict zero crossing if any.

6	6	6	6	5	4	3	2	2	2	2	2	2	6	6	6	6	6
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- c) Define mixed adjacency. Explain how it eliminates ambiguity that often arises with 8 – adjacency.
- d) Explain chain code with example
- e) Define: i) Sampling ii) Quantization iii) Image contrast iv) Brightness  
v) Pixel

**Q.4** Write short notes on any **THREE** of the following (15)

- a) High Pass filter in frequency domain
- b) Morphological operations
- c) Power law transformation
- d) Wiener Filtering
- e) Image enhancement

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