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Sixth Semester B.E. Degree Examination, June/July 2023
Digital Image Processing

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a. What is digital image processing? Explain the fundamental steps of image processing with block diagram. **(08 Marks)**
    b. With diagram explain image formation in an eye. **(06 Marks)**
    c. Explain the following with respect to relationship between pixels   i) Adjacency ii) Distance. **(06 Marks)**

OR

2   a. Explain the process of image sampling and quantization. **(10 Marks)**
    b. Explain the following:
       i)   Image acquisition using single sensor
       ii) Image acquisition using sensor array. **(10 Marks)**

Module-2

3   a. Explain different types of piecewise linear transformations. **(08 Marks)**
    b. Explain order statistics filters and smoothing linear filters. **(08 Marks)**
    c. Write a note on selective filtering. **(04 Marks)**

OR

4   a. What is Histogram processing? Explain Histogram equalization technique. **(08 Marks)**
    b. Explain different image sharpening methods for filtering in frequency domain. **(12 Marks)**

Module-3

5   a. Explain different noise probability density functions. **(10 Marks)**
    b. Explain adaptive median filter algorithm used for noise removal. **(10 Marks)**

OR

6   a. Explain the estimation of degradation function using i) Observation   ii) Mathematical modeling. **(10 Marks)**
    b. Write a note on:
       i)   Inverse filtering
       ii) Wiener filtering. **(10 Marks)**

Module-4

7   a. Explain the opening and closing in morphological image processing. **(10 Marks)**
    b. Explain RGB and CMYK colour model. **(10 Marks)**

OR

8 a. Explain the procedure for converting RGB to HSI colour model and vice-versa. (08 Marks)
   b. Write a note on:
      i)   Intensity slicing
      ii) Hit or miss transformation. (12 Marks)

Module-5

9 a. Explain the following image segmentation techniques:
      i)   Line detection
      ii) Edge detection. (10 Marks)
   b. Explain any two types of region descriptors. (10 Marks)

OR

10 a. Explain region splitting and merging. (08 Marks)
   b. Explain any three types of boundary descriptors. (12 Marks)

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