CBCS SCHEME

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18AI62

Sixth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Digital Image Processing

Time: 3 hrs. Max. Marks: 100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. What is digital image processing? Explain its origin and applications in detail. **(10 Marks)**

b. Consider two images S_1 and S_2 shown in Fig.Q1(b), for V = {1}, determine whether there two subsets are: (i) 4-adjacent (ii) 8-adjacent (iii) m-adjacent. Mention suitable conditions for all the above given adjacency.

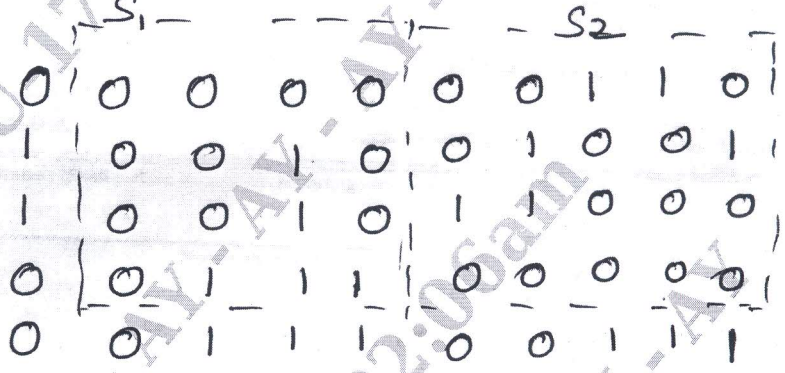

Fig.Q1(b) **(10 Marks)**

OR

2 a. Illustrate fundamental steps in digital image processing. **(10 Marks)**

b. Explain the basic concept and representation of digital images in converting an analog to digital image with a neat diagram. **(10 Marks)**

Module-2

3 a. Explain the mechanics of spatial filtering using a 3 * 3 filter mask and write the generalized response R. **(10 Marks)**

b. Relate the concept of correlation and convolution with an example – zero padding of 1D function. **(10 Marks)**

OR

4 a. Report all high pass filters used in sharpening filters in frequency domain. **(10 Marks)**

b. Discuss histogram processing and equalization and conditions to obtain a flattened histogram. **(10 Marks)**

Module-3

5 a. Outline the concept of restoration process. Justify the usage of mean filters in restoration in the presence of noise in spatial domain. **(10 Marks)**

b. Discuss any five noise models along with their graph and PDF. **(10 Marks)**

OR

6 a. Report different types of filters used in periodic noise reduction in frequency domain filtering. **(10 Marks)**

b. Estimate the degradation function with respect to image observation, experimentation and modeling. **(10 Marks)**

Module-4

7 a. Explain different color models used in color image processing. **(10 Marks)**

b. Describe different functions used in multi-resolution expansions. **(10 Marks)**

OR

8 a. Write notes on:
(i) Erosin (ii) Dilation
(iii) Duality (iv) Hit-or-Miss Transformation **(10 Marks)**

b. Brief out any four morphologic algorithm. **(10 Marks)**

Module-5

9 a. What is the objective of segmentation? Explain edge detection segmentation. **(10 Marks)**

b. Write short notes on:
(i) Thresholding
(ii) Fourier descriptors **(10 Marks)**

OR

10 a. Discuss various representation approaches in detail. **(10 Marks)**

b. Explain Hough transforms and shape detections. **(10 Marks)**

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