Exam.Code:0919
Sub. Code: 33472

2076

B.E. (Computer Science and Engineering)

Seventh Semester

CS-701: Digital Image Processing

Time allowed: 3 Hours Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I. Answer the following:-

a) How much memory is needed to store a RGB image of size 512*512 having 8-bit resolution?

b) Draw the model of Image degradation/Restoration process.

c) What is meant by image segmentation? Write its use in image processing.

d) What are additive and subtractive color models? What are their uses?

e) Write down the potential problems of boundary detection techniques. (5x2)

UNIT - I

II. a) Explain the steps involved in a typical digital image processing system.

b) Discuss sampling and quantization. Show with diagrams how sampling rate affects image resolution. (5,5)

III. a) Explain intensity transformation functions with suitable examples (log, gamma, negative).

b) Distinguish between spatial domain filtering and frequency domain filtering.

c) Describe histogram specification. (4,4,2)

IV. a) Derive the image degradation-restoration model.

b) Describe any two noise models and their statistical characteristics.

c) What is homomorphic filtering, and why is it used? (4,3,3)

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UNIT - II

V. a) Explain Huffman coding with a numerical example using 5 symbols.

b) What is interpixel redundancy? Explain with an example.

c) Describe the main stages of JPEG compression. (4,3,3)

VI. a) Explain Sobel, Prewitt, and Roberts operators for edge detection.

b) Describe the Hough Transform for detecting straight lines.

c) What is region growing and its use? Discuss its advantages and limitations. (4,3,3)

VII. **a)** Explain boundary representation methods and compare chain codes with polygonal approximation.

b) Describe any two regional descriptors used for object recognition.

c) What is boundary linking and its need? Discuss boundary linking algorithm. (4,3,3)

x-x-x