Tribhuvan University
Institute of Science and Technology
2076

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Bachelor Level / Third Year /Fifth Semester/Science
Computer Science and Information Technology (CSc.321)
(Image Processing)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Section A

Long answer questions
Attempt **any two** questions

$(2 \times 10 = 20)$

1. Explain "power law transformation" techniques for the purpose of image enhancement. Explain the mean filter along with suitable algorithm for its implementation (4+6)

2. What is Fourier Transform and how can you apply it in the digital image processing? Explain the different properties of the Fourier Transform. (4+6)

3. Explain the adaptive thresholding and region split and merge techniques for image segmentation (5+5)

Section B

Short answer questions
Attempt **any eight** questions

$(8 \times 5 = 40)$

4. Discuss the various applications and problems associated with the digital image processing in brief.

5. Discuss the algorithm for histogram equalization.

6. Explain the first derivative filter with a suitable example.

7. How will you implement Butterworth high Pass Frequency domain filter for image sharpening in the frequency domain? Describe in brief.

8. Explain Contra-harmonic Mean Filters used for image restoration.

9. Describe lossless predictive coding model with a suitable block diagram.

10. Explain opening and closing morphological operations in brief.

11. Discuss the magnification of image using interpolation technique.

12. Discuss Neural Network based image recognition system with the help of a simple perceptron.