

Tribhuvan University
Institute of Science and Technology
2080
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Bachelor Level / Third Year /Fifth Semester/Science
Computer Science and Information Technology (CSC321)
Image Processing
(NEW COURSE)

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

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

Section A

Attempt any TWO questions.

[2×10 = 20]

1. Explain different steps in digital image processing. Define neighbor of a pixel. How do you find the distances between pixels? [6 + 2 + 2]
2. Why do we need to enhance the image? How do you use histogram in image enhancement? Differentiate between log transformation and power log transformation. [2 + 4 + 4]
3. Explain the properties of fourier transformation. Derive the relation for 1-D fast fourier transformation in spatial domain. [5 + 5]

Section B

Attempt any EIGHT questions.

[8 × 5 = 40]

4. Explain image degradation and restoration process. [5]
5. Why do we need to remove noise? Discuss about median, max and min filter. [1 + 4]
6. Define image segmentation. Explain the three basic types of grey level discontinuities detection. [1 + 4]
7. How band reject filters are used to remove periodic noise? Explain. [5]
8. Describe the algorithm for region splitting and merging in brief. [5]
9. Explain how inter pixel redundancy can be identified and exploited. [5]
10. Explain erosion with an example. [2 + 3]
11. How signature is used in boundary representation? What does shape number mean? Explain. [2 + 3]
12. Define pattern and pattern class. How do you detect foreground and background of the image? Explain. [1 + 4]