Pokhara University

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| Level: Bachelor | Semester: Spring | Year : 2014 |
| Programme: BE | | Full Marks: 100 |
| Course: Image processing and pattern Recognition | | Pass Marks: 45 |
| Time : 3hrs. |

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

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|  | a) What is a digital image? How sampling and quantization works in the process of image digitization  b) Sum up the applications of the image transform functions. State  and prove the additive and similarity theorem for 2-D Fourier  Transform. | 7  8 |
|  | 1. What is Fast Fourier Transform? Explain about Haar transform in detail. 2. Given the following grey level histogram of an image. Compute the Histogram equalization.   Gray Level 0 1 2 3 4 5 6 7  Frequency 200 500 40 600 800 60 1800 1000 | 7  8 |
|  | 1. What is magnification? Illustrate with an example to clarify the concept of magnification by replication and interpolation. 2. Find Huffman codes from the given the histogram information of an image:   Grey Level 0 1 2 3 4 5 6 7  Frequency 61 39 130 200 315 515 410 330 | 8  7 |
|  | 1. Why is pattern recognition system used? Explain about the components with relevant diagram   b) What is feature extraction? Explain how can you use model during recognition and classification | 7  8 |
|  | 1. What are the benefits of template matching? Explain any one edge detection technique 2. Differentiate between Similarity and Correlation. | 8  7 |
|  | 1. Why is Thresholding important during Segmentation? Explain global processing via the Hough transforms 2. Differentiate between Hopfield and hamming net with examples. | 8  7 |
|  | Write short notes on: (**Any two**)   1. Transform domain 2. Directional smoothing 3. Classification | 2×5  5  5  5 |