

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
 TEST -1 EXAMINATION- September 2017

B. Tech (CSE) VII Semester / Ph.D

COURSE CODE: 10B1WCI737

MAX. MARKS: 15

COURSE NAME: Image Processing Techniques

MAX. TIME: 1Hr

COURSE CREDITS: 04

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Ques 1 [3 Marks] Discuss the purpose of image processing and its novel applications in brief.

Ques 2 [1+3= 4 Marks] Explain the singular value decomposition (SVD) of an image in brief? Find SVD of the image segment

$$I = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 1 \\ 0 & 0 & 1 \end{pmatrix}$$

Ques 3 [2+2 = 4 Marks] Discuss the algorithmic steps of Haar basis for N=4. Also, calculate the Haar transform of the image

$$I = \begin{pmatrix} 0 & 1 & 1 & 0 \\ 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{pmatrix}$$

Ques 4 [2+2 = 4 Marks] State the rotation properties of discrete Fourier transform (DFT)? Also, compute the DFT of an multimedia data in form of image is shifted so that its top left coordinate, instead of being at position (0,0), is at position (-3/2, -3/2).

$$I = \begin{pmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

CI-13, BT Ph.D