

Code: 9D06205

M.Tech II Semester Supplementary Examinations February 2018

**IMAGE & VIDEO PROCESSING**

(Common to DSCE, DECS, ECE &amp; Com Sys)

(For students admitted in 2012, 2013, 2014, 2015 &amp; 2016 only)

Time: 3 hours

Max. Marks: 60

Answer any FIVE questions  
All questions carry equal marks

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- 1 The image  $f(x, y) = 4 \cos(4\pi x) \cos(6\pi y)$  is sampled with  $\Delta x = \Delta y = 0.1$ . The sampled image is reconstructed with an ideal low pass filter with cut off frequencies of  $\pm 1/2 \Delta x$  and  $\pm 1/2 \Delta y$ . Find the reconstructed image.
- 2 State and prove following properties of 2D-DFT:
  - (i) Translation.
  - (ii) Periodicity.
  - (iii) Conjugate symmetry.
- 3 Suppose that you form a low pass spatial filter that averages the 4-neighbors of point  $(x, y)$ , but excludes the point  $(x, y)$  itself.
  - (i) Find the equivalent filter  $H(u, v)$  in the frequency domain.
  - (ii) Show that your result is a low pass filter.
- 4
  - (a) Explain the concept of image degradation model.
  - (b) Discuss the concept of wiener filtering.
- 5 Discuss different types of clustering techniques related to image segmentation.
- 6
  - (a) Discuss different types of image redundancies.
  - (b) Discuss about image fidelity criterion.
- 7 Formulate the Shannon – Fano code for the word DADDY.
- 8 Discuss about sampling of video signals.

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