

Roll No

MCA - 505(B)**MCA. V Semester**

Examination, December 2015

Computer Vision and Digital Image Processing**(Elective - III)****Time : Three Hours****Maximum Marks : 70**

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
- ii) All parts of each question are to be attempted at one place.
- iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
- iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Give the function of rods and cones present in human eye. What is the effect on image if number of gray levels used to represent the image are reduced?
- b) Give two applications of computer vision and explain briefly.
- c) Explain the terms - pixel, neighbours of a pixel, bitmap.
- d) Explain the fundamental steps in image processing.

OR

Discuss the elements used for image acquisition, storage, processing, communication and display.

- Define digital image, What do you mean by image sampling and quantization?
- Discuss the effect of :
 - Variation of image resolution and
 - Variation of number of gray levels used to represent an image.
- How can a point be rotated about an arbitrary point in space? Explain.
- Explain periodicity, translation and separability properties of 2D Fourier transform.

OR

Obtain Fourier transform of the function shown in fig. 1 and plot its Fourier spectrum.

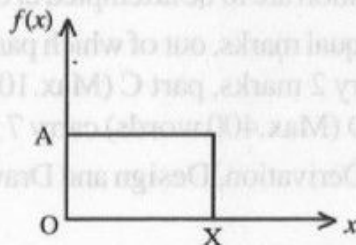


Fig. 1

- Draw a 3x3 median filter. What is median filtering and what is its utility?
- Write the transfer function of an ideal low pass filter. Explain low pass filtering.
- Define histogram of an image. How is histogram equalization achieved?
- How can sharpening filters be achieved in spatial domain? Explain.

OR

Explain homomorphic filtering.

- How can lines be used to detect discontinuities in an image?
 - What is the difference between edge and boundary? How is global thresholding used for segmentation of an image?
 - What is an edge? How edge detection is achieved?
 - How edge linking is achieved through hough transform?

OR

Discuss how global processing is done via graph theoretic technique?

- Define signature and skeleton?
 - How is texture determined statistically?
 - What is a chain code? Explain its use. Draw directional members for a 4 and 8 directional chain code.
 - What are features in an image? Why feature matching is required. Explain one method to achieve feature matching.

OR

Write short notes on:

- Hough transform
- Optic flow
