
Total No. of Questions : 09

MCA (Sem.-4) DIGITAL IMAGE PROCESSING Subject Code : PGCA1963 M.Code : 91860 Date of Examination : 03-01-2023

Time: 3 Hrs.

Max. Marks : 70

Total No. of Pages : 02

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION B & C have FOUR questions each.
- 3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
- 4. Select atleast TWO questions from SECTION B & C.

SECTION-A

I. Write short notes on :

- a) What is digital image? How it is represented in computer memory?
- b) Define pixel and resolution in context of an image.
- c) What is sampling?
- d) What is translation in digital image?
- e) Explain about spatial filtering with a suitable example.
- f) Explain about image restoration using minimum mean square error filtering?
- g) What is image compression? Why it is needed? Explain.
- h) Explain some major steps for JPEG compression.
- i) Explain the effect of noise on edge detection.
- j) Discuss about region based segmentation.

SECTION-B

- 2. What is Haar Transform? Write the procedure to find the Haar transformation matrix.
- 3. What is histogram equalization? Perform equalization on the histogram given below:-

Grey level	0	1	2	3	4	5	6	7
Frequency	0	0	90	200	400	240	70	0

- 4. Differentiate between convolution and correlation with suitable mathematical example.
- 5. Explain smoothening of image in frequency domain. Explain any two frequency domain filters of your choice.

SECTION-C

- 6. Explain inverse filtering. Give the drawbacks of inverse filtering in image restoration.
- 7. What is wavelet transform? Explain how the wavelet transform can be used for image compression?
- 8. Explain Huffman coding. Perform Huffman coding for the following set of symbols.

Symbol	Probability
А	0.2
В	0.1
С	0.05
D	0.6
Е	0.05

9. Explain Otsu's algorithm for global thresholding using suitable equations.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.