

B.Tech IV Year II Semester (R13) Advanced Supplementary Examinations July 2017

**DIGITAL IMAGE PROCESSING**

(Electronics & Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

**PART - A**  
(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
  - (a) List the steps involved in digital image processing.
  - (b) Name the various arithmetic and logical operations that can be done on images.
  - (c) What are the properties of unitary transform?
  - (d) Write short notes on hotelling transform.
  - (e) Compare spatial and frequency domain methods.
  - (f) Write the application of sharpening filters.
  - (g) What are the three types of discontinuity in digital image?
  - (h) What is inverse filtering?
  - (i) Define compression ratio.
  - (j) Define arithmetic coding.

**PART - B**  
(Answer all five units, 5 X 10 = 50 Marks)

**UNIT - I**

- 2 Explain the basic elements of digital image processing.
- OR**
- 3 Explain in detail about:
    - (a) Image sampling.
    - (b) Image quantization.

**UNIT - II**

- 4 Discuss the properties of discrete Fourier transform.
- OR**
- 5 Discuss about Hadamard transform (1-D & 2-D).

**UNIT - III**

- 6 Explain image enhancement in the frequency domain.
- OR**
- 7 What are image sharpening filters? Explain the various types of it.

**UNIT - IV**

- 8 Explain the concept of inverse filtering.
- OR**
- 9 What is image restoration? Explain the degradation model for continuous function in detail.

**UNIT - V**

- 10 Explain:
  - (a) Bit plane coding.
  - (b) Run length coding.

**OR**

- 11 How to find Huffman coding for the given data:

Original source symbol	a1	a2	a3	a4	a5	a6
probability	0.1	0.4	0.06	0.1	0.04	0.3