

DATE: 25/05/2012 Branch - Biomedical Sem-VII (REV)

AGJ 1st half (j)-Con-Cod 16  
Con. 3926-12.

**Principles of Image Processing**  
(REVISED COURSE)

GN-6458

YTIET/LIB/ENGIG/BM/SEM-VII/PII/25 May 2012 (3 Hours)

[Total Marks : 100]

N.B. : (1) Question No. 1 is compulsory.

(2) Attempt any four questions from remaining six questions.

(3) Figures to the right indicating full marks.

Q1. State whether the following statement is true or false. Justify your answer. 20

A) "Zooming an image improves information contents of the image."

B) "When you enter a dark theater on a bright day, it takes an appreciable interval of time before you can see well enough to find an empty seat."

C) "Spatial averaging smoothens the image while high pass filtering sharpens the image."

D) "Poorly illuminated images can be easily segmented."

E) "Quantization process is responsible for loss of information."

Q2 A. A 64X64 image represented by 8 bits per pixel has the following gray level distribution. Perform histogram equalization and give new distribution of gray level show plot of original and equalized image. 10

Gray Level	0	1	2	3	4	5	6	7
No. of Pixels	128	75	280	416	635	1058	820	684

Q2 B. Explain in detail Homomorphic Filter. 10

Q3 A. Describe briefly the features of a compression model with a neat block diagram 10

Q3 B. Explain in detail enhancement techniques in spatial domain: 10  
a) Image Negative  
b) Bit plane Slicing  
c) Contrast stretching



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- Q4 A. Explain in detail Region base Segmentation. 10
- Q4 B. Explain Edge linking in detail. 10
- Q5 A. Explain with the block diagram basic steps in filtering in frequency domain. 08
- Q5 B. Show that 1-D DFT can be used to compute 2-D DFT of an image. Using 4 point FFT algorithm, evaluate DFT of the following image. 12

0	1	2	1
1	0	1	2
2	1	0	1
1	2	1	0

- Q6 A. Explain the following methods of data compression specify whether it's lossy or lossless and which type of redundancy it will minimize. 10
- Arithmetic Coding
  - Run Length Encoding
- Q6 B. Given below is the table of eight symbols and their frequency of occurrence generate the Huffman codes for each symbols. 10

Symbol	S0	S1	S2	S3	S4	S5	S6	S7
Probability	0.25	0.15	0.06	0.08	0.21	0.14	0.07	0.04

- Q7. Differentiate the following : 20
- Spatial resolution and Gray level resolution
  - Convolution and Co-relation
  - Ideal low pass filter and Ideal high pass filter
  - Haar Transformation and Hadamard Transformation
  - Lossless Compression and Lossy Compression