

Time: 1 Hr

In Sem - Exam

Max. Marks = 30

Sub: Digital Image Processing

Marking Scheme

Que 1 (A) Proper Explanation — 6 marks.
(Any six points/steps)

(B) Histogram of image — 2m
scaling & rotation of image — 2m.
OR

Que 2 (A) 1. 4 connectivity — 2m
2. 8 Connectivity — 2m
3. Mixed connectivity — 2m.

(B) RGB to HSI — 2m
HSI to RGB — 2m.

Que 3 (A) 1. Log transformation — 2m
2. Power law — 2m
3. Contrast stretching — 2m

(B) Any four points — 4m.
OR

Que 4 (A) histogram before equalization — 2m
Correct steps for equalization — 2m
histogram after equalization — 2m.

(B) Any two noise models — 4m.

Que 5 (A) Definition of Redundancy — 2m
Diff. types of Redundancies — 4m.

(B) DCT base image compression model — 4m. 1/3

OR

BE) In Sem-41

Que 6

(A)

(i) Entropy of image - 2M

(ii) Huffman code book - 4M.

(B)

Fidelity criteria - 4M.

2/3

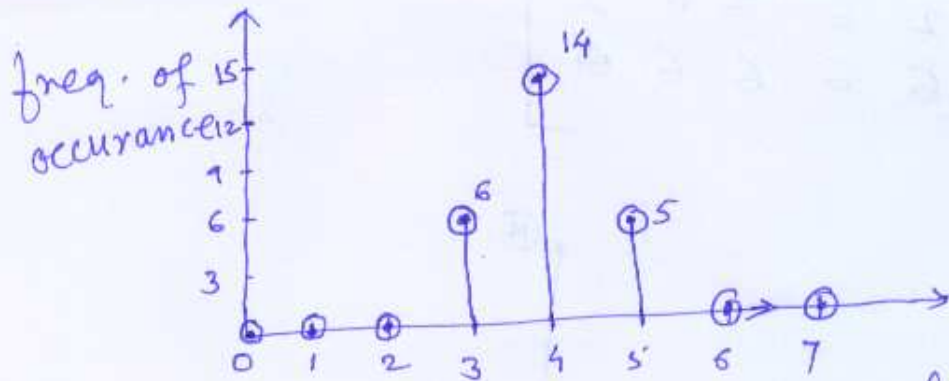
Solution

BE/In Sem - 41

Q-4(A)

$$I = \begin{bmatrix} 4 & 4 & 4 & 4 & 4 \\ 3 & 4 & 5 & 4 & 3 \\ 3 & 5 & 5 & 5 & 3 \\ 3 & 4 & 5 & 4 & 3 \\ 4 & 4 & 4 & 4 & 4 \end{bmatrix}$$

Histogram for I before equilization.



Histogram equilization

H=Gray levels	0	1	2	3	4	5	6	7
X= Nos of Pixels	0	0	0	6	14	5	0	0
$\sum X$	0	0	0	6	20	25	25	25
$\hat{S} = \frac{\sum X}{N}$	0	0	0	0.24	0.8	1	1	1
$S \times 7$	0	0	0	1.68	5.6	7.7	7	7
rounding off of S	0	0	0	2	6	7	7	7

Histogram of Image After Equalization :-

Image after Histogram Equalization :-

$$\hat{I} = \begin{bmatrix} 6 & 6 & 6 & 6 & 6 \\ 2 & 6 & 7 & 6 & 2 \\ 2 & 7 & 7 & 7 & 2 \\ 2 & 6 & 7 & 6 & 2 \\ 6 & 6 & 6 & 6 & 6 \end{bmatrix}$$

