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T-3 EXAMINATION (JUNE 2016)

B.Tech 8th Sem. (ECE) & M.Tech 2nd Sem. (ECE)

COURESE CODE: 16M1WEC231 MAX. MARKS: 35

COURSE NAME: Advanced Digital Image Processing

COURSE CREDITS: 3 MAX. TIME: 2 Hrs.

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Attempt all parts of a question at one place.

Q1a) Discuss the various redundancies present in digital images. **(1+1+1 =3)**

Q1b). Apply Huffman coding procedure to find out the coding efficiency for the following message

Ensemble for **M =3**: $[X] = [X_1\ X_2\ X_3\ X_4\ X_5\ X_6\ X_7\ X_8]$

$[P] = [0.1\ 0.25\ 0.15\ 0.05\ 0.15\ 0.1\ 0.05\ 0.15]$ **(3)**

Q1c). How does dictionary based coding approach works? Write down the steps or pseudo code. **(1)**

Q2a). Discuss the techniques to detect three basic gray-level discontinuities in digital image.

(1.5*3 = 4.5)

Q2b). Define histogram of a digital image. How will the histogram of various contrast's images like dark image, bright image, low contrast image and high contrast image be distributed? **(0.5+2=2.5)**

Q3a). Discuss in detail Dilation and Erosion. **(1.5*2= 3)**

Q3b). The median of a set of numbers is such that half the values in the set are below median and the other half are above it. For example, the median of the set of values {1, 5, 11, 21, 25, 28, 30} is 21. Show that an operator that computes the median of a subimage area, S , is nonlinear. **(2)**

Q3c). Discuss two methods to estimate the degradation function in image restoration. **(2)**

Q4a). Discuss various types of Thresholding techniques for digital images. **(3)**

Q4b). Discuss the working of various frequency domain filters for periodic noise removal. **(3)**

Q4c). What are the consequences of varying the spatial resolution of a digital image? **(1)**

Q5. Write short note on following:-

i) Opening and Closing **(1.5*2=3)**
ii) Region based segmentation **(2)**
iii) JPEG **(2)**