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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
Test III EXAMINATION- December 2021
B.Tech. Fifth Semester

COURSE CODE: 18B1WEC536

COURSE NAME: FUNDAMENTALS OF DIGITAL IMAGE PROCESSING

COURSE CREDITS: 03

MAX. MARKS: 35

MAX. TIME: 2 Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1) Calculate the arithmetic code for the following pixel dataset: { 26, 30, 26, 45 }. [5]

Q2) Using Lempel-Ziv-Welch (LZW) coding for image compression encode the following 4 x 4 image. [5]

48	48	150	150
48	48	150	150
48	48	150	150
48	48	150	150

Q3) Calculate the Huffman code for the following pixels in an image. The pixels along with their probability of occurrence in the image are as given below. [5]

Pixel	10	22	32	125	175	205
Probability	0.20	0.30	0.06	0.15	0.04	0.25

Q4) Perform boundary extraction on image A with the help of structuring element B. [5]

A =	1	1	1	0	1	1	1	1	0
	1	1	1	0	1	1	1	1	0
	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1
B =	1	1	1						
	1	1	1						
	1	1	1						

Q5) For the one dimensional function A and structuring element B, compute $A \circ B$. (A closing by B). $A=\{5,7,11,8,2,6,8,9,7,4,3\}$. $B=\{1,2,1\}$ [5]

Q6) Find the 2 dimensional DFT of $F=[0 \ 1 \ 2 \ 1; 1 \ 2 \ 3 \ 2; 2 \ 3 \ 4 \ 3; 1 \ 2 \ 3 \ 2]$ [5]

Q7) A polygon with vertices $A(0,0)$; $B(1,0)$; $C(1,1)$; $D(0,1)$. Perform simultaneous x and y shearing with $a=2$ and $b=3$. [5]