JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATIONS-2022

B.Tech-VII Semester (ECE)

COURSE CODE (CREDITS): 18B1WEC847 (3) MAX. MARKS: 15

COURSE NAME: Medical Image Processing

COURSE INSTRUCTOR: Dr. Shruti Jain MAX. TIME: 1 Hour

Note: *All questions are compulsory.*

Short Questions (1 × 5 = 5)

Q1. Aditi is learning concepts of pixel and learns that pixel p at coordinates (x, y) has 4 neighbors (N4P). Let us know which coordinates she learned. [CO1]

Q2. An image is 2400 pixels wide and 2400 pixels high. The image was scanned at 300dpi. What is the physical size of the image? [CO1]

Q3. Assume that an image $f(x, y)$ is sampled so that the result has M rows and N columns. If the values of the coordinates at the origin are $(x, y) = (0, 0)$, then the notation (0, 1) signifies which sample and row. [CO1]

Q4.The class teacher asks students to write the mathematical expression of the inversion operation and log transform operation on (g(x, y)). What they will write? (use L as the number of grey levels). [CO2]

Q5. Compute the cumulative running of pixels if the probabilities are 8, 10, and 2. [CO2]

Long Questions (2 × 5 = 10)

Q6. Help Siya in finding the convolution of an image having F = [0, 0, 1, 0 , 0] and the kernel = [1 3 5]. [CO2]

Q7. Given a greyscale image on paper whose physical dimensions is 3 inch by 3 inches scanned at a rate of 250dpi. Calculate how much time is required to transmit the image if the modem is 30kbps. [CO1]

Q8. Perform the Histogram Equalization on the following 3 × 3, eight-level image [CO2]

$$\begin{vmatrix} 1 & 3 & 5 \\ 4 & 4 & 3 \\ 5 & 2 & 2 \end{vmatrix}$$

Q9. How do you bring out more of the skeletal detail from a Nuclear Whole Body Bone Scan? [CO2]

Q10. Which of the technique fails to work on dark intensity distributions? [CO2]