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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- OCTOBER-2019

B.Tech. VII Semester

COURSE CODE: 18B1WEC734

MAX. MARKS: 25

COURSE NAME: MEDICAL IMAGE PROCESSING

COURSE CREDITS: 3

MAX. TIME: 1.5 Hours

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

Q1. Explain the three main applications for which image processing system is required?

[3]CO1

Q2. Design filters (or template or mask) of size 3X3 that can be used to implement the following operations on any image:

- Edge Detection
- Isolated Point Detection
- Smoothing Filtering

[3]CO2

Q3. Draw the transformation curve for the following transformation to be applied on an image whose every pixel uses 4 bits for storage:

- Identity Transformation
- Log Transformation
- nth Power Transformation

[3] CO2

Q4. For the pixel present at 4th row and 3rd column in image I shown below, determine the average filtered value and median filtered value obtained on applying the average filter and median filter of size 5X5 respectively on the image I.

I=

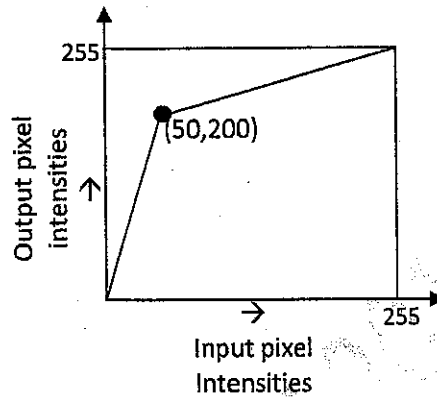
110	150	200	150	110
200	80	35	30	40
100	60	32	29	35
200	70	40	43	45
150	15	42	40	11
200	90	90	90	150

[4] CO2

Q5. Determine the output image obtained on implementing the transformation curve given below on the image I given below:

I =

10	150	200	150
200	80	30	30
100	60	30	20
200	70	40	40
150	10	40	40
200	90	90	90



[3] CO2

Q6. Design the four filters that can be used to detect the lines oriented at 0° , 45° , 90° , and 135° . With the help of an example explain the working of all these 4 filters.

[4] CO2

Q7. For the image I given below, draw a normalized histogram. From the histogram drawn, is it possible to segment out the object located at the center of the image represented by a rectangle? If yes, explain the steps to be followed for segmenting the object? Determine the segmented image obtained and represent the desired object as white and all the remaining part of the image as black.

I =

110	150	200	150	110	90	200
200	80	35	30	40	150	110
100	60	32	29	35	110	150
200	70	40	43	45	150	110
150	15	42	40	11	90	150
200	90	90	90	150	150	110

[5] CO2