

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

B.Tech-VIII Semester (CSE/IT/CE)

COURSE CODE(CREDITS): 21B1WEC731 (3)

MAX. MARKS: 25

COURSE NAME: Digital Image Processing using Python

COURSE INSTRUCTORS:Dr. Nishant Jain

MAX. TIME: 1 Hour 50 Minute

*Note: (a) All questions are compulsory.*

*(b) Marks are indicated against each question in square brackets.*

*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

Q1. Explain with example the need of image processing for autonomous machine application.

[3] CO1

Q2. Using OpenCV package, write python code to do the following:

- Read two images "abc.jpg" and "xyz.jpg" and assign them to variables img1 and img2 respectively.
- Check if the size of the two images are same or different.
- If the sizes are different, then write a code to make the size of both the images equal.
- Add the two images and assign it to variable img3.
- Plot the histogram of the first image.
- Change the pixel values of all the pixels present in the first 10 rows of the first image to 100.

[1X6=6] CO3

Q3. Write an algorithm to subtract any two given images (in uint8 format) without considering the OpenCv package.

[4] CO2

For Questions 4 and 5, Consider the following images A and B: (It is given that both the images are in uint8 format)

A=

100	100	100	100	100
100	200	200	200	100
100	200	200	200	100
100	100	100	100	100
100	100	100	100	100

B=

250	250	250	250	250
250	50	50	50	250
250	50	50	50	250
250	50	50	50	250
250	250	250	250	250

Q4. Perform the operation of image subtraction on above two images (A-B). Show step wise solution and the resultant image obtained.

[4] CO2

Q5. Draw the histogram of image A. Explain how with the help of histogram, one may tell the number of objects (including background) present in the image.

[4] CO2

Q6. Write a short note on the following:

- Histogram Equalization
- Image enhancement in the Spatial domain.
- Image enhancement in the frequency domain.
- Binary Image vs GrayScale Images.

[4] CO1