

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

M.Tech - II Semester (ECE - IoT)

COURSE CODE (CREDITS): 21M1WEC231(3)

MAX. MARKS: 25

COURSE NAME: Image Sensing and Real Time Processing

COURSE INSTRUCTORS: Dr. Nafis U. Khan

MAX. TIME: 1 Hour 30 Min

*Note: All questions are compulsory. Marks are indicated against each question in square brackets.*

Q1. Explain in detail, the concept of image enhancement in spatial domain. CO2 [5]

Q2. Explain the difference between the operations involving  $3 \times 3$  mask for median filtering and average filtering. CO2 [5]

Q3. (a) Compare histogram stretching and histogram equalization. CO2 [3]

(b) Suppose we have a dark image which needs to be compressed and also equalized. Which operation would we use first? Will the results be the same if the order of the operations is reversed? CO2 [2]

Q4. Equalize the given histogram: CO2 [5]

Gray Level	0	1	2	3	4	5	6	7
Number of Pixels	100	90	50	20	0	0	0	0

Q5. (a) Explain the concept of convolution in image filtering. CO3 [2]

(b) Compute 1-D convolution of the given sequences. CO3 [3]

$$x_1[n] = \{1, \bar{2}, 0, 1\}$$

$$x_2[n] = \{1, \bar{2}, 1\}$$

(The bar above the number indicates the value at  $n = 0$ )