K. J. Somaiya Institute of Engineering and Information Technology, Sion, Mumbai-22

(Autonomous College Affiliated to University of Mumbai)

End Semester Exam

May-June 2022

Program: B. Tech EXTC

Examination: TY Semester: VI

Course Code: 1UEXC603 and Course Name: Image Processing and Machine Vision

Duration: 03 Hours   Max. Marks: 60

Instructions:

(1)All questions are compulsory.

(2)Draw neat diagrams wherever applicable.

(3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	**Solve any six questions out of eight.**	12		
i)	Why the size of the mask is odd?	2	1,2	U
ii)	If all the pixels in an image are shuffled, will there be any change in the histogram? Justify your answer?	2	1,2	U
iii)	Explain separable property of Fourier transform	2	2	U
iv)	What is morphology of an image? How it is useful in image processing?	2	3	U
v)	Write any two boundary descriptors.	2	5	U

vi)	Explain how image restoration is different from image enhancement	2	4	U
vii)	Draw the PDF of bipolar noise and explain in brief.	2	4	U
viii)	Explain the significance of Confusion matrix.	2	6	U
Q.2	**Answer any 4 out of 6**			
i)	Find the Euclidean, Chess board and City block distance two pixels p(4,5) and q (2,3).	4	1	Ap
ii)	The PDF of an equalized image is not perfectly Uniform. Is this statement true or false? Justify your answer.	4	2	An
iii)	Filter the following image using 3 X 3 neighbouring averaging by assuming zero padding. <table><tr><td>1</td><td>2</td><td>3</td><td>2</td></tr><tr><td>4</td><td>2</td><td>5</td><td>1</td></tr><tr><td>1</td><td>2</td><td>6</td><td>3</td></tr><tr><td>2</td><td>4</td><td>6</td><td>7</td></tr></table>	4	3	Ap
iv)	Identify the edge or line in an image of 8x8 size with 32 grey levels with pixel values 8,9,11,12,15,31,29,28.in a row. Justify your answer	4	4	An
v)	How the texture analysis is carried out using the co-occurrence matrix?	4	5	U
vi)	Explain the classification principle for Machine Learning.	4	6	U

Q.3	Answer any 2 questions			
i)	Explain following transforms and mention their applications A) Wavelet transform B) Haar transform	8	2	U
ii)	What do you understand by signatures? How they are used for image representation?	8	5	U
iii)	What is Dilation and Erosion? Explain with proper example. What is effect of eroding the image after dilation?	8	3	U
Q.4	Answer any 2 questions			
i)	Explain the Hough transform implementation for edge linking with an example	8	2,3	U
ii)	What is Support Vector Machine, Explain the SVM classifier?	8	6	U
iii)	Explain any 4 noise models used for image restoration and write their mean and variance	8	4	U